PROBLEM SOLVING ABILITY IN MATHEMATICS AMONG UPPER PRIMARY SCHOOL STUDENTS OF KERALA

JIDHINA K.

Dissertation Submitted to the University of Calicut
in Partial Fulfilment of the Requirements for the Degree of

MASTER OF EDUCATION

FAROOK TRAINING COLLEGE
UNIVERSITY OF CALICUT

2017

DECLARATION

I, Jidhina K, do hereby declare that this dissertation "**PROBLEM SOLVING ABILITY IN MATHEMATICS AMONG UPPER PRIMARY SCHOOL STUDENTS OF KERALA**" has not been submitted by me for the award of a Degree, Diploma, Title or Recognition before.

Farook Training College

Date : **JIDHINA K**

CERTIFICATE

I, **Dr. K. VIJAYAKUMARI**., do hereby declare that this dissertation **"PROBLEM SOLVING ABILITY IN MATHEMATICS AMONG UPPER PRIMARY SCHOOL STUDENTS OF KERALA"** is a record of bonafide study and research carried out by **JIDHINA K.,** under my guidance and supervision. The report has not been submitted by her for the award of a Degree, Diploma, Title or Recognition before.

Farook Training College **Dr. K. VIJAYAKUMARI**
Date:

Acknowledgement

The investigator is deeply indebted to her supervising teacher, ***Dr. K. Vijayakumari****, Associate Professor, Farook Training College, for her constant encouragement, generous help and valuable suggestions.*

The investigator would like to express her profound gratitude to ***Dr. C.A. Jawahar****, principal, Farook Training College, for his whole hearted co-operation in extending facilities and encouragement to conduct this study.*

The investigator expresses her thanks to the faculties, the librarian and the supporting staff for their co-operation extended to complete the present study.

The investigator is obliged to the head of the institutions and the students of various schools in Kannur, Wayanad, Kozhikode, Malappuram and Palakkad districts, who extended their support to collect the data related to this study.

The investigator acknowledges with at most pleasure her friends and family members who have whole heartedly co-operated with the study.

Farook Training College ***Jidhina K***

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER I

INTRODUCTION

- Need and Significance
- Statement of the Problem
- Definition of Key Terms
- Objectives
- Hypotheses
- Methodology
- Scope and Limitations
- Organization of the Report

Education is a process by which the knowledge of an individual is enriched by the experiences he receive. The gift of knowledge is the best which gives opportunities to a person to rise to his fullest potential and drawing out all his abilities. Education is essential for the benefit of an individual and the society. The ideals of a nation determine the nature of education imparted to its citizens. In turn education has an important role to play in the socio-economic and political development of the nation and the world as a whole.

Human resource is considered as one of the most valuable resources in the development of a country. The quality of human resources depends upon the quality of education system that follows. Now-a-day employment market demands individuals with natural talents together with some additional skills such as soft skills, life skills and communication skills. For the optimum utilization of opportunities provided by the global village, a person needs to acquire these skills and abilities. So, education should focus on development of skills among children.

A programme on mental health by World Health Organization (1997) described life skills are abilities for adaptive positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life. Also they explained about the core set of skills that are very useful for the well being of children and adolescents, Problem Solving is one among them.

During the twenty first century, it is said that in the new economy, knowledge rather than natural resources, is the raw material of business (Center for

regional studies, 2002). In a country like India, for advanced economy, innovative industries and firms require more educated or skilled persons with the ability to respond flexibly to complex problems and manage information. Twenty first century skills are the indispensible currency for global economy. These are the abilities that students need to develop in order to succeed in the information age. Problem Solving is considered as one among the major twenty first century skills. It helps the students to think deeply about issues, solve problems creatively, take initiative and to produce something new and useful.

Every individual in his day to day life faces various problems and everyone has his own strategies to solve or deal with it. The ways these problems are dealt determine the path and the successes of life of the individual. The education of an individual directly or indirectly influences one's ability to solve the problems he or she confronts. A systematic approach to Problem Solving is possible only through education. Education is one of the primary and necessary provisions for children to get training in basic skills and to indulge the knowledge required for successful life.

A variety of subjects are included in the school curriculum, with some specific objectives, that finally leads to the ultimate aims of education. From the ancient times itself, Mathematics occupied prominent role in the subjects of study because of its values- the disciplinary and utilitarian. Importance of Mathematics as a school subject and the purposes of Mathematics education are highlighted by many commissions and committees.

As per National Policy on Education (1986) "Mathematics should be visualised as the vehicle to train a child to think, reason, analyze and to articulate logically." National Curriculum Framework (2005) signifies that:

> "Developing children's abilities for Mathematisation is the main goal of Mathematics education. The narrow aim of school Mathematics is to develop useful capabilities, particularly those relating to numeracy.... It includes a way of doing things and the ability and the attitude to formulate and solve problems" (p.42).

Problem Solving is an important aspect of Mathematics education and a major goal of teaching Mathematics is to develop ability to solve the problems using the logical reasoning and knowledge in Mathematics.

Problem, according to Webster's dictionary is, "a question raised for inquiry, consideration or solution ...a source of perplexity, distress or vexation". That is, a problem is a perplexing question or situation. Here perplexing implies that the question or situation is of some interest and that the student will accept it. According to Kilpatrick (1985) "A problem is a situation in which a goal is to be attained and a direct route to the goal is blocked."

For solving a problem, it requires the insight, previous knowledge, skills and understanding of the students. Also it requires ability to apply it in new situations. The Problem Solving Ability is the cognitive capacity of an individual to perform his act based on his capabilities, so as to achieve the goal of solving a problem.

Cockcorft (1982) defined Problem Solving as "a means of developing mathematical thinking as a tool for daily living, saying that Problem Solving Ability lies at heart of Mathematics because it is the means by which Mathematics can be applied to a variety of unfamiliar situation." Problem Solving in Mathematics may be described as the process of arriving at a solution to the problem which involves the use of Mathematics.

A person needs to make use of his /her ability to solve problems involving knowledge of Mathematics in many life situations. In earlier days, the society was not as much complicated as today and the problem faced by individuals were more local in nature. But in the present age of global village the problems that an individual may face are more unique and complex than ever before. The classrooms cannot be considered as a storehouse to prepare students to solve all these problems that they may confront in future. But it should act as a place to develop the ability to solve problems independently. Mathematics is a subject which help its learners to develop ability to solve problems of various nature.

Need and Significance

In the information age, after the schooling or safe zone of protected environment a child should reach in the next stage of life. There they will confront new vistas of challenging experiences or complex life problems. No one can avoid these problems in their life. So for developing a fully functioned individual capable of dealing with challenges one should get plenty of Problem Solving experiences and experiences to address their challenging needs. That may enable them to evolve gracefully as fulfilled individual or a good citizen.

Problem Solving Ability is identified as one among the twenty first century skills, which helps a person to climb up the ladder of success. The main goal of Mathematics learning is to develop the Problem Solving Ability among learners. In Mathematics, a single problem may be approached through various ways, enabling the learners to use the acquired knowledge in to the problems of daily life in different ways and to tackle them successfully. Individual gets happy while solving a problem by using his own efforts. This pleasure helps them to face more challenging situations or problems. It fosters their cognition, reasoning and creativity.

The ability to solve a problem is different in each person. From cradle to grave yard, the ways one faces the challenges of life may be different, but everyone will have their own Problem Solving strategies related to the stage of development. Gagne (1965) identified Problem Solving Ability as the highest stage in the hierarchy of learning, the accomplishment of which depends upon one's ability to deal successfully with the principles that they have already learnt. That is, for reaching at the higher level one has to master or get success in the lower levels.

The fourth cognitive and intellectual developmental stage of Piaget (1971), the formal operational stage begins around 11 years of age. At this stage of cognitive development a child has the ability to think logically about abstract propositions, test hypothesis systematically, different ways of approaching a problem, critical thinking and Problem Solving Ability. Hence, itself it can be considered that formal ways of solving problems are expected to be mastered by students of this age group.

Mathematics learning at upper primary stage is particularly for developing logical thinking, critical thinking and Problem Solving Ability among students and it is expected that this will enable the child to prepare for their life.

Most of the Problem Solving Ability tests have given importance to the product, i.e., they check only whether the final answer is correct or wrong. For creating good problem solvers emphasise should be given on the process of Problem Solving. A diagnostic approach to Problem Solving is needed in its measurement but such tests are very rare in the field. Through this study the investigator tries to prepare a Mathematical Problem Solving Ability Test based on the stages of Polya. The process oriented test is necessary to find out the stage or the gap where students face difficulty while finding the solution of a problem.

Several studies are conducted in the area of Problem Solving Ability. Majority of these studies are based on the factors influencing Problem Solving Ability. The direct or indirect factors influencing Mathematical Problem Solving Ability are attitude towards Mathematics, Mathematical anxiety, self esteem, teacher's teaching behaviour, self efficacy, interest, motivation and cognitive background of students (Guven & Ozum, 2013; Pimta, Tayraukham, & Nuangchalerm, 2009; Bahar & Maker, 2015). Some studies are reported on the effectiveness of certain methods and strategies in improving Problem Solving Ability (Deepa, 2012; Karatas & Baki, 2013). Thomas (2014) found that Polya's approach is more effective than the activity oriented method in Problem Solving of secondary school students in Mathematics. Though studies are conducted on Problem Solving Ability, no studies are found to be reported related to the Problem

Solving Ability among upper primary school students in Kerala. Also a review of studies showed that measurement of Problem Solving Ability in various studies is not unique and majority are based on achievement in Mathematics.

In general girls and boys are found to be performing better in competitive examinations related to Mathematics. Whether they differ in their Problem Solving Ability is relevant to study so that teachers can take special attempts to improve the ability.

Birth order theory and other related studies indicate that first, second and later born children have difference in their decision making and reasoning. So, an attempt to find out whether they show any difference in their abilities to solve problems in Mathematics is required.

The qualification of teachers, scope for their professional development and the infrastructural facilities are same for aided and government schools, but unaided schools may differ in these aspects, especially teacher orientation. A comparison of Problem Solving Ability among students of different Types of management is also relevant.

Statement of the Problem

The ability to solve problem is very essential for successful living and the teaching of Mathematics puts one of its major goals as development of Problem Solving Ability among students. The purpose of the present study is to find out the extent of Problem Solving Ability in Mathematics and also to find out the main and interaction effects of Gender, Birth order and Type of management of the school on

Problem Solving Ability in Mathematics. Hence the present study is stated as "**PROBLEM SOLVING ABILITY IN MATHEMATICS AMONG UPPER PRIMARY SCHOOL STUDENTS OF KERALA.**"

Definition of Key Terms

Problem Solving Ability in Mathematics

Polya (1945) defined "Problem Solving as finding a way out of a difficulty, a way around an obstacle, attaining an aim that was not immediately attainable." He offers four stages of Problem Solving viz., Understand the problem, Devise the plan, Carry out the plan and Looking back

In the present study, Problem Solving Ability in Mathematics is taken as the sum of scores on ability to understand the problem, devise the plan and carry out the plan measured through a Mathematics Problem Solving Ability Test developed by the investigator.

Upper Primary School Students

Upper primary school is the stage of education which comes after the four years of primary education. It includes standard V, VI, and VII. Upper primary school students are the children aged around 11 to 14 years old studying in standard V, VI or VII.

Objectives

The objectives of the study are

1. To develop a Problem Solving Ability Test in Mathematics.
2. To find out the extent of Problem Solving Ability in Mathematics among upper primary school students.
3. To find out the main and interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics of upper primary school students.

Hypotheses

1. The main effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant.
2. The interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant.

Methodology

Participants

The study was conducted on a sample of 550 standard VII students from five revenue districts of Kerala viz., Kannur, Wayanad, Kozhikode, Malappuram and Palakkad. Weightage was given to government, aided and unaided schools as 3:3:1. Equal representation was given to girls and boys.

Instruments

Following instruments were used for the study,

1. Mathematics Problem Solving Ability Test (Vijayakumari & Jjidhina, 2017)
2. Personal data sheet

Statistical Techniques Used

The collected data was analysed using the following statistical techniques

1. Descriptive statistics
2. Three way ANOVA

Scope and Limitations of the Study

The purpose of the study was to find out the extent of Problem Solving Ability in Mathematics among upper primary school students with a diagnostic approach. It gives an insight to teachers regarding the importance of improving students ability to solve problems in Mathematics and in daily life. The findings of the study will help the teachers and the experts in the field to understand the Problem Solving Ability of students and take necessary measures to improve their ability to solve problems in Mathematics and the problems they may face in their future life. The prepared Mathematics Problem Solving Ability Test helps the teachers to find out the stage where their students have gap or face difficulty while solving the problem. It helps the teachers to provide need based remedial classes.

Though utmost care was taken, certain limitations crept into the study. Some of them are,

The study was confined to seventh standard students only, as fifth and sixth standard students are at a very early stage of Problem Solving. The sample was selected from five districts of northern part of Kerala and representation was not given for districts from south Kerala. Due to time limit, sample size was limited to 550. Because of some practical difficulty the fourth stage of Polya's Problem Solving i.e., looking back was not included in the Mathematics Problem Solving Ability Test. Content areas like factors, prime numbers, composite numbers and multiples were discarded from the selected content for the test preparation. It was done based on the feedback obtained from Mathematics teachers through a focus group discussion.

Organization of the Report

The report of the study has been presented in five chapters

Chapter I: This chapter contains a brief introduction of the problem, definition of key terms, objectives, hypotheses, methodology, scope and limitations of the study and organisation of the report.

Chapter II: Contains theoretical overview of Problem Solving Ability and the studies related to Problem Solving Ability and Problem Solving Ability in Mathematics,

Chapter III: This chapter includes design, variables, participants, instruments used, data collection procedure and the statistical techniques used.

Chapter IV: Includes the statistical analysis used, its interpretation and tenability of hypotheses.

Chapter V: Presents the summary of the study, major findings, conclusion, educational implications and suggestions for further research.

CHAPTER II

REVIEW OF RELATED LITERATURE

- Theoretical Overview
- Studies Related to Problem Solving Ability
- Studies Related to Problem Solving Ability in Mathematics
- Conclusion

REVIEW OF RELATED LITERATURE

A careful and thorough literature review is very essential at any level of research. It provides information about what research has been done in past in the area of the study and helps the investigator to update his / her knowledge related to the field, in which he is going to do the research. It also helps the investigator for formulating problem, stating hypotheses select the appropriate methodology and to interpret the results.

This chapter provides a brief description about the literate reviews related to the variable Problem Solving Ability in Mathematics under three headings viz., theoretical overview, studies related to Problem Solving Ability and studies related to Problem Solving Ability in Mathematics.

Theoretical Overview

The word problem is derived from the Greek word problema, literally meaning, something that thrown forward (Travers, Pikkart, Suydam & Runion, 1977). The Encyclopedic unabridged dictionary of the English language defined problem as “any question or matter involving doubt, uncertainty, or difficulty....in Mathematics, a statement requiring a solution, usually by means of a mathematical operation or geometric construction”.

According to Mayer (1994):

> "A problem consists of a given state (i.e., a description of the current situation) and a set of operators (i.e., rules or procedures for moving from

one state to another). A problem occurs when a situation is in one state and there are obstacles to a smooth transition from one state to the other" (p.4722).

Types of Problems

Problems are classified by many educators in different ways. Some such classifications are attempted below.

Sternberg (2007) classified problems into two, well structured and ill structured problems. The well structured problems may have clear paths to solution, the route to solution still may be difficult to follow. But the ill structured problems do not have well defined problem space. Problem solvers feel difficulty in constructing appropriate mental representations for modelling these problems and their solutions.

Mayer (1994) classified problems based on three criteria. That is the classification was done based on the clarity of the problem statement, based on the familiarity of the problem to the problem solvers and based on the nature of thinking needed for solving the problem. These classifications are discussed below.

Based on the clarity of the problem statement, problems are classified as well defined and ill defined. A well defined problem has a clear given state, goal state and a clear set of allowable operations. An ill defined problem has a poorly specified given state and goal state. Most of the problems encountered in school are well defined whereas most of the crucial problems in everyday life are ill defined.

Based on the knowledge of the problem solver, problems can be classified as routine and non routine problems. Routine problems are identical or very similar to problems that the problem solvers have already solved and therefore require reproductive thinking. Non routine problems are different from any problems that they have solved previously, and therefore require productive thinking i.e., creating a novel solution. Work on routine problems is called exercise and most important problems in everyday life are non routine.

Problems require convergent and divergent thinking. Convergent thinking problems have a single correct answer that can be determined by applying a procedure or retrieving a fact from memory. Divergent thinking problems have many possible answers and so the problem solvers need to create as many solutions as possible. Most school based problems emphasise convergent thinking.

Vaidya (1968) classified problems as experimental, symbolic, numerical and mixed problems. Experimental problems are also called Piaget type problems. Back ground information is needed for this problem. Symbolic problems deal with symbols but are not in fact hard exercise in algebra. Numerical problems deal with numbers but they are definitely based on some scientific application of some known law or principle. They test more than computational ability. Mixed problems involve symbols as well as quantities. These problems are generally comparatively easier than the symbolic ones but they do involve seeing relationship.

As Travers, Pikkart, Suydam and Runion (1977) commented, the classification of problems in Mathematics seems almost limitless. Based on the content involved, Mathematical problems can be classified as mixture problems,

distance problems, real life problems, number problems, proofs, insightful problems, open search problems and so on.

Problem Solving occurs when a problem solver engages in cognitive activity aimed at overcoming a problem. Exponents in the field and psychologists defined Problem Solving in their own ways. In developing computer simulation of Problem Solving, Newell and Simon (1972, as cited in Mayer, 1994) defined Problem Solving as a search for a path between the given and goal states of a problem. Mayer (1994) summarized three major aspects of a definition of Problem Solving:

> "(a) Problem Solving is cognitive, because it occurs internally within the problem solvers cognitive system (b) Problem Solving is a process because it involves manipulating or performing operations on the problem solver's knowledge and (c) Problem Solving is directed, because the problem solver is attempting to achieve some goal" (p.4723).

Logical steps \ stages in Problem Solving

Problem Solving is a systematic scientific process of solving a problem. It has specific steps or stages to be followed. Researchers in the field have recommended various stages for solving problems. The steps of Problem Solving suggested by some experts in the field are given below.

Dewey (1910, as cited in Ornstein, 1990) identified five steps for Problem Solving

- Aware of difficulty

- Identifying the problem
- Assembling and classifying data and formulating hypotheses
- Accepting or rejecting tentative hypotheses
- Formulating conclusions and evaluating them

The five steps of Problem Solving by Gray (1956) are

- Sensitivity to problems
- Knowledge of problem conditions
- Suggested solution or hypothesis
- Subjective evaluation
- Conclusion or generalization

Johnson (1994, as cited in Vaidya, 1968) recommended the three stages of Problem Solving as

- Orienting to the problem
- Producing relevant material
- Judging the solution

According to Polya (1945), the major steps of solving a problem are

- Understand the problem
- Devise the plan
- Carry out the plan
- Looking back

Prabha (2006) made an attempt to look for a simplistic approach to Problem Solving process in Physics in the context of projective motion. A sequential step for Problem Solving in teaching and learning process was suggested. It includes

- Defining the problem situation
- Describing the problem
- Thought process
- Visualisation

Sternberg (2007) suggested the following seven steps for Problem Solving

- Problem identification
- Definition of problem
- Constructing a strategy for Problem Solving
- Organization of information
- Allocation of resources
- Monitoring Problem Solving
- Evaluating Problem Solving

Baron and Misra (2014) described that effective Problem Solving involves four stages, viz.,

- Problem identified and understood
- Potential solutions generated
- Solutions examined and evaluated
- Solutions tried and results evaluated

Different views or approaches on Problem Solving

Most of the researches on Problem Solving falls within three categories: Associationist, Gestalt and Cognitive (Mayer, 1994).

The associationist approach, which dominated psychology throughout the first half of the twentieth century, views Problem Solving as the production of a series of responses until one works. According to this view, Problem Solving involves generating responses based on one's past experiences with the problem situation. A major criticism of this approach concerns how it can account for creative Problem Solving.

Behaviourist also argued that Problem Solving is a reproductive process. That is, organisms faced with a problem applied their previous behaviour that had been successful on a previous occasion or which are similar to situations met before. If these do not lead to solution of the problem confronted, the learner use trial and error. Throndike's Law of Effect had greatly influenced the behaviourist view of Problem Solving.

The Gestalt approach was proposed by a number of psychologists in 1920s and 1930s. They pointed out that Problem Solving is a productive process. They view Problem Solving as mentally recognizing the elements of the problem so that they fit together in a new way. Thus, the major task in Problem Solving is to achieve structural understanding, that is to see how the given elements acquaint with the requirements of the goal. The insightful learning as Sternberg (2007) says, is a

special process which comprises more than the sum of its parts and may be the suddenness of realizing a solution.

The cognitive view, as explained by Mayer (1994) sees Problem Solving as a series of mental computations. They suggest a theory of Problem Solving that specify the specific mental processes to solve a problem and the methods that problem solvers employ for selecting and controlling their cognitive processes.

Theories Related to Problem Solving

Many learning theories emphasize Problem Solving and some major works are explained below

Gagne's theory of hierarchy of learning

Gagne (1965) proposed a hierarchy of learning in the order signal learning, stimulus response learning, chaining, verbal association, multiple discrimination, concept learning, principle learning and Problem Solving. According to him Problem Solving is the highest position or form of learning. If a person need to accomplish learning at the level of Problem Solving he must be successfully pass or overcome the underlying forms. That is successful accomplishment of all the seven stages leads to the final stage of hierarchy i.e., Problem Solving.

Piaget's stages of cognitive development

Piaget (1971) developed a theory of intellectual development and proposed four stages of cognitive development, as sensory motor, preoperational, concrete operational and formal operational. According to him after the concrete operational

stage (i.e., during the formal operational stage) students develop ability to solve a problem or students begin to think abstractly and reason about hypothetical problems.

Space theory of Problem Solving

Newell and Simon (1972) proposed the theory of Problem Solving which explains solving of problem as searching a problem space by people. The problem space consists of the current state, the goal state and all possible states in between. Problem space can be more the key issue is how people move through possibilities, given their limited working memory capacities or how do they choose actions to move from one state to another (operators). For many problems domain knowledge helps a person to decide what to do. But for a new or novel problem they proposed that operators' selection is guided by cognitive shorts cuts (known as heuristics).

Methods for Solving Problems

According to Baron and Misra (2014) some methods for Problem Solving are trial and error, algorithm, analogy and meta cognitive process. Trial and error is a method of Problem Solving in which possible solutions are tried until one succeeds. Algorithm is a rule that guarantees a solution to a specific type of problem. Analogy stands for a strategy for solving problems based on applying solutions that were previously successful with other problems similar in underlying structure. Metacognitive process involves expanding our level of awareness in a sense, observing ourselves engaged in the Problem Solving process. Metacognition

seems to promote cognitive activities that lead to more effective problem solution, such as a focus on the actual Problem Solving process.

According to Sternberg (2007) a well structured problem can be solved by using algorithms and humans are more likely to use informal heuristics such as means ends analysis, working forward, working backward, and generate and test. For solving ill structured problems people may insight.

Obstacles to Effective Problem Solving

Baron and Misra (2014) pointed out functional fixedness and mental sets as the factors that can interfere with the effective Problem Solving. Functional fixedness is the tendency to think of using objects only as they have been used before and the later is the tendencies to stick with familiar methods.

Studies Related to Problem Solving Ability

Praveen (2017) developed a schema based instructional module with MOODLE to foster Problem Solving Ability in Physics at higher secondary level. it was found that schema based module with MOODLE is more effective to foster the Problem Solving Ability of higher secondary school students in Physics than schema based instruction without MOODLE and the usual expository method of teaching.

Kumari (2016) studied Problem Solving Ability of senior secondary school students of Kerala. The results showed that students of government and private schools do not differ significantly in their Problem Solving Ability. It was revealed through the study that Problem Solving Ability of female students is higher than the

male students and there exist significant difference in Problem Solving Ability among senior secondary school students in relation to their stream.

Rani and Begam (2016) studied Problem Solving Ability and emotional intelligence of higher secondary students. The study revealed that significant correlation is found between Problem Solving Ability of higher secondary students and their emotional intelligence based on Gender and locality of school and it was also found that male and female higher secondary students have no difference in their Problem Solving Ability. It was also found that there is no difference in the Problem Solving Ability of higher secondary students with respect to locality.

Relationship among creative thinking, Problem Solving and academic achievement of secondary school students was studied by Sajeena (2016). The study revealed that secondary school boys and girls have difference in their Problem Solving Ability. The result showed that creative thinking, Problem Solving and academic achievement are positively correlated to each other.

George, Sanandaraj and Rajan (2014) studied the Gender difference and similarities in stress tolerance and Problem Solving Ability among teenagers and it was found that male and female differ significantly in stress tolerance and Problem Solving confidence. In both variables, males have higher score than females.

The relationship between science aptitude and Problem Solving Ability in chemistry among higher secondary school students was studied by Aravind (2013).The results showed that the level of Problem Solving Ability in chemistry is average or satisfactory and it was also found that there is a significant positive

correlation between science aptitude and Problem Solving Ability in chemistry for the total sample as well as subsamples based on Gender, locale of school and Type of management.

Problem Solving Ability in physical science of secondary school students was studied by John (2013). The study revealed that majority of students have average Problem Solving Ability in physical science. It also revealed that girls have higher Problem Solving Ability in physical science than boys and aided students have higher Problem Solving Ability in physical science than that of government school students.

An experimental study on the effect of learning environments based on Problem Solving on students achievement of Problem Solving was conducted by Kratas and Baki (2013). For creating a problem based learning environment the investigators provided activities and problems to students and asked them to proceed all those problems based on Polya's Problem Solving stages. Students performance were analysed based on the Problem Solving stages and it was found that experimental group students success in Problem Solving activities has increased than the controlled group.

Sreesan (2013) conducted an experimental study on the effectiveness of reflective learning strategy on Problem Solving Ability in Accountancy of higher secondary school commerce students and it was found that students taught through reflective learning strategy was better in Problem Solving Ability in Accountancy than students taught through constructive method of teaching.

The relationship between scientific literacy and Problem Solving Ability among secondary school pupils of Kozhikode district was tested by Swetha (2013). It was found that there exist a positive relationship between scientific literacy and Problem Solving Ability among the total and subsamples. It also revealed that Problem Solving Ability of female students is less than that of male and in the case of Type of management, Problem Solving Ability is approximately equal in government and aided students.

The effectiveness of Gagne's instructional strategy in enhancing Problem Solving skill among higher secondary school commerce students was examined by Thasmi (2013) and the study concluded that the usage of Gagne's instructional strategy is more effective than existing method of teaching in enhancing Problem Solving skill among higher secondary school commerce students.

Johnson and Ramganesh (2012) conducted a study on self regulatory awareness in physical science Problem Solving among the teacher trainees. The findings of the study revealed that the level of self regulatory awareness among the student teachers is low. The findings also revealed that female students have better self regulatory awareness than male students teachers.

George and Raj (2011) studied the relationship between Problem Solving and stress tolerance among teenagers. The results showed that there exist significant relationship between Problem Solving and stress tolerance among teenage students, which shows that Problem Solving Ability is seen in people who are stress tolerant.

Jose and Thomas (2011) examined Problem Solving Ability and scholastic achievement of secondary school students. It was found that there is no significant difference in the relationship between Problem Solving Ability and scholastic achievement of secondary school learners with respect to Gender but difference exist in the relationship with respect to locale and Type of management of school. The investigator also found that boys have higher Problem Solving Ability when compared to girls and private school students have higher Problem Solving Ability than government school students.

Praveen (2006) studied the effect of mastery learning strategy on Problem Solving Ability in Physics of secondary school students and found that there exist no significant effects of mastery learning strategy on the Problem Solving Ability in Physics for the secondary school students.

Fawcett and Garton (2005) conducted an experimental study on the effect of peer collaboration on children's Problem Solving Ability and it was found that children who collaborated collectively obtained a significantly higher number of correct sorts than who worked individually.

D'Zurilla, Olivares and Kant (1998) examined age and Gender difference in social Problem Solving Ability. The result showed that the social Problem Solving Ability increase from young adulthood (17-20) middle age (40-55) and then decrease in the older age (60-80). The Gender difference were found on positive problem orientation and negative problem orientation

The Problem Solving Ability in biological science of high, average and low biology achievers at secondary school level was assessed by Haridasan (1989). The study revealed that there is significant relationship between Problem Solving Ability in biological science and Biology achievement.

The effect of sex, locale and attitude towards Problem Solving on process outcomes in Biology was studied by Noushad (1989). The study revealed that the main effect of attitude towards Problem Solving on process outcomes in biology is significant and the investigator also found that the interaction effect of Gender and locale and Gender and attitude towards Problem Solving on process outcomes in biology are significant.

Studies Related to Problem Solving Ability in Mathematics

Novak and Tassell (2017) studied pre service teacher math anxiety and Mathematics performance in geometry, word and non-word Problem Solving. The researchers analysed the relationship between Mathematics Problem Solving and Mathematics anxiety in each of the three mathematical domains as function of working memory, spatial ability and attitudes towards learning Mathematics and found that relationship between Mathematics anxiety and Mathematics performance varied by mathematical domain.

Asharani and Francis (2015) conducted an experimental study on the effect of vedic Mathematics on speed and accuracy in Problem Solving Ability in Mathematics at secondary level. The findings of the study revealed that vedic

Mathematics method is comparatively more effective than activity oriented method in developing speed and accuracy of Problem Solving in Mathematics.

The relationship between Mathematics anxiety and Problem Solving Ability in Mathematics among secondary school students of Kannur district was studied by Smitha (2015). The researcher found a significant negative correlation between Mathematics anxiety and Problem Solving Ability. The investigator also found that secondary school boys and girls differ in their Problem Solving Ability in Mathematics. The study also concluded that government and aided school students have no significant difference in the mean score of Problem Solving Ability in Mathematics of secondary school students.

Thomas (2014) conducted a study on the effectiveness of Polya's approach on Problem Solving and problem creating ability in Mathematics of secondary school students and it was found that Polya's approach is more effective than the activity oriented method in the Problem Solving Ability of secondary school students in Mathematics and its branches such as geometry, algebra and arithmetic. The researcher also found that Polya's approach is effective in enhancing the mathematical Problem Solving Ability and mathematical problem creating ability among secondary school students.

Mathematical Problem Solving Ability of secondary school pupils of Malappuram district was examined by Arun (2013). The study showed that students studying in secondary school have above average Problem Solving Ability in Mathematics. Girls and boys show difference in their Problem Solving Ability in Mathematics and among them girls have higher Problem Solving Ability in

Mathematics than boys. It was also found that unaided school pupils have higher Problem Solving Ability in Mathematics than aided and government school students.

The relationship between emotional intelligence and Problem Solving Ability in Mathematics among secondary school students of Malappuram district was studied by Chacko (2013). It was found that boys and girls show significant difference in their Problem Solving Ability in Mathematics. The study resulted that there is no significant difference in the mathematical Problem Solving Ability of government and aided secondary school students of Malappuram district and the relationship between emotional intelligence and Problem Solving Ability in Mathematics is positive and significant.

Guven and Ozum (2013) studied factors influencing mathematical Problem Solving achievement of seventh grade Thurkish students. They found the direct and indirect factors affecting Problem Solving achievement. The investigators found a highly significant relationship between academic success and Problem Solving and a moderate significant relationship is observed between students' Problem Solving attitude, Problem Solving beliefs, mathematical anxiety and self efficacy perception for Mathematics and their Problem Solving achievement. It was also revealed that the indirect factors and Problem Solving achievement have no significant relationship.

The effects of cognitively guided Problem Solving was studied by Spilde (2013). The findings of the study revealed that Problem Solving innovation was effective in increasing the Problem Solving Ability of all participants.

An experimental study on the effectiveness of gallery walk strategy on Problem Solving Ability in Mathematics of standard VIII pupils by Sudha (2013) and the study was concluded as gallery walk strategy is an effective method of teaching over existing method of teaching on Problem Solving Ability in Mathematics.

Improving Problem Solving Ability in Mathematics by using a mathematical model: a computerized approach was an experimental study conducted by Panaoura (2012). The results showed that providing students with the opportunity to self reflect on their learning behaviour when they encounter obstacles in Problem Solving was one way to enhance students self regulation and consequently their mathematical performance.

Sumangala and Rinsha (2012) studied the interaction effect of thinking styles and deductive reasoning on Problem Solving Ability in Mathematics of secondary school students. It was found that both deductive reasoning and executive thinking style have significant main effect on Problem Solving Ability in Mathematics for the sample. It was also found that the interaction effects of each of the three thinking styles (legislative thinking style, judicial thinking style and executive thinking style) and deductive reasoning on Problem Solving Ability in Mathematics is not significant for the sample.

Mathematical profiles and Problem Solving Ability of mathematically promising students was studied by Budak (2012). The study revealed that mathematically promising students were very determined, spent a long time in

thinking, reflecting and planning and attempted to solve the challenging problems multiples of time.

Deepa (2012) conducted a study on the effect of co operative learning on critical thinking and Problem Solving Ability in Mathematics among higher secondary students. The study concluded that the Problem Solving Ability in Mathematics of students of the cooperative learning approach group is greater than the traditional method group. It was also revealed that cooperative learning approach is more effective than the traditional method in developing Problem Solving Ability of the boys and girls.

Avacu and Avacu (2010) examined pre service elementary Mathematics teachers' use of strategies in mathematical Problem Solving and it was found that pre service elementary Mathematics teachers have capacity to use Problem Solving strategies but they used it very limited. The study also pointed out that they used five distinct solution strategies viz., making a drawing, accounting for all possibilities, adapting a different point of view, finding a pattern, organising data. Despite of these most of the students were not able to solve problem correctly.

Karasel, Ayda and Tezer (2010) studied the relationship between Mathematics anxiety and Mathematics Problem Solving skills among primary school students and found out a low level of relationship between Mathematics anxiety and mathematical Problem Solving Ability.

Tambychik and Meerah (2010) examined students' difficulties in Mathematics Problem Solving. The investigators found that students faced

difficulties in Mathematics Problem Solving due to incompetency in acquiring many mathematical skills and lacking in cognitive abilities of learning such as the ability to recall, memorise and perceive that influence the efficiency of Problem Solving.

Griffin and Jitendra (2009) studied word Problem Solving instruction in inclusive third grade Mathematics classroom. The authors compared the mathematical word Problem Solving performance and computational skills of students who received schema based instruction with students who received general strategy instruction. The result showed that a significant difference between groups on the word Problem Solving progress measure at time that favour schema based instruction group.

Pimta, Tayraukhm and Nuangchalerm (2009) investigated the factors influencing mathematical Problem Solving Ability of sixth grade students. Investigators found that attitude towards Mathematics, self esteem and teachers teaching behaviour are the direct factors that influence Problem Solving and the indirect factors include motivation and self efficacy.

Tarim (2009) conducted an experimental study on the effect of cooperative learning on preschooler's Mathematics Problem Solving Ability. The investigator concluded that the cooperative learning method can be successfully applied in teaching verbal Mathematics Problem Solving skill during the preschool period.

Sameena (2008) studied the interaction effect of classroom climate and learning strategies on Mathematics Problem Solving Ability of secondary school students. The study revealed that the main effects of the variable learning strategy on

mathematical Problem Solving Ability of secondary school students are significant. The study also found that the interaction effect of classroom climate and learning strategies on mathematical Problem Solving Ability of secondary school students is not significant.

Anitha (2003) examined certain affective and learning characteristics of successful problem solvers in Mathematics of secondary school pupils of Kerala. The results showed that some of the affective and learning characteristics for successful problem solvers in boys and girls are different and 13 affective and 15 learning characteristics were identified for successful problem solvers in Mathematics. Some of the prominent affective characteristics identified were extrovert, ambitious, optimistic, curious, critical thinking and use Mathematics learning in daily life. The most prominent learning characteristics identified are self directive in learning, correlative in learning, prefer learning by doing, systematic in learning and ask thought provoking questions.

The social acceptance of successful and less successful problem solvers in Mathematics of standard IX pupils of Kerala was studied by John (2003). The investigator arrived at conclusion that social acceptance was highly dependent and high degree of association exist with Problem Solving Ability in Mathematics for the total sample and for the subsamples studied.

A study of Problem Solving Ability in Mathematics of IX standard students of Palakkad district was studied by Parvathy (2002). The investigator found that girls performance in Mathematics Problem Solving is better that that of boys and

rural school students performed better in Mathematics Problem Solving than that of urban school.

The effect of certain demographic variables on the mathematical Problem Solving process skills of secondary school pupils of Kerala was examined by Shreedevi (2002). It was concluded that several demographic variables have significant effect on the process skills in Mathematics.

Lakshmi (1998) conducted a study on the construction of a problem test in Mathematics for secondary students and study the Problem Solving Ability of students of Class X in twin cities of Hyderabad. The investigator studied the relationship between Problem Solving Ability and demographic factors such as area, Gender, community, parental occupation, parental income, parental educational qualification and the category of schools. The result revealed that rural and urban students show difference in Problem Solving Ability in Mathematics and there exist no difference between the performance of boys and girls regarding Problem Solving Ability in Mathematics.

Interaction effect of creativity, attitude towards Problem Solving and social position on achievement in mathematics of secondary school pupils were studied by Thampuratty and Devi (1996). The results showed that there exist significant main effects of attitude towards Problem Solving on achievement in Mathematics. It was found that there exist a moderate significant interaction effect of creativity, attitude towards Problem Solving and social position on achievement in Mathematics and the study also revealed a positive, moderate and significant relation exist between attitude towards Problem Solving and achievement in Mathematics.

Conclusion

The reviews conducted in the area of Problem Solving Ability in Mathematics helped the investigator to acquaint with the current information related to the field of study. Most of the studies are based on the direct and indirect factors that influence Problem Solving Ability. Effectiveness of certain methods and strategies in improving Problem Solving Ability are also reported. Review of studies on Problem Solving Ability shows that Problem Solving is a thrust area on which many researchers focus. Majority of studies are conducted among secondary and higher secondary school students. No studies were found to be reported at upper primary level, though it is a crucial period where the capacity for Problem Solving develops as Piaget's theory claims. Studies on Problem Solving Ability in Mathematics show inconsistent results on Gender difference, difference on the basis of Type of management. Certain demographic variables were also put under investigation. These studies used different approaches to Problem Solving mainly based on the content taught in the class. A more general, diagnostic approach to Problem Solving assessment was found to be less attempted and hence the present study is relevant which focus on Problem Solving Ability in Mathematics of upper primary students and its comparison based on Gender, Birth order and Type of management of the school.

CHAPTER III

METHODOLOGY

- Design
- Variables
- Objectives
- Hypotheses
- Participants
- Instruments
- Data Collection Procedure
- Statistical Techniques Used

METHODOLOGY

Research methodology is the systematic procedure to solve research problem. The description of methodology followed by an investigator helps others to understand the significance of what the investigator has done and make a sense of how it worked.

The methodology of the present study is described under the following headings.

- Design
- Variables
- Objectives
- Hypotheses
- Participants
- Instruments
- Data collection procedure
- Statistical techniques used

Design

Present study is a descriptive research which used survey method to find out Problem Solving Ability in Mathematics among upper primary school students of Kerala.

Variables

The variable of the study is Problem Solving Ability in Mathematics. It is taken as the sum of scores on ability to understand the problem, devise the plan and carry out the plan, measured through Mathematics Problem Solving Ability Test developed by the investigator.

In the present study, main and interaction effects of Gender, Birth order and Type of management on Problem Solving Ability in Mathematics was studied. Hence the categorical variables considered are Gender, Birth order and Type of management of the school.

Objectives

The objectives of the study are

1. To develop a Problem Solving Ability Test in Mathematics
2. To find out the extent of Problem Solving Ability in Mathematics among upper primary school students
3. To find out the main and interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics of upper primary school students

Hypotheses

1. The main effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant

2. The interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant.

Participants

The population under study is upper primary school students of Kerala. A sample of 550 seventh standard students of various schools of Kannur , Wayanad , Kozhikode, Malappuram, and Palakkad districts were selected using stratified sampling technique. While selecting sample, the proportion of government, aided and unaided schools were considered as 3:3:1. The break-up of the basal sample is given as figure 1.

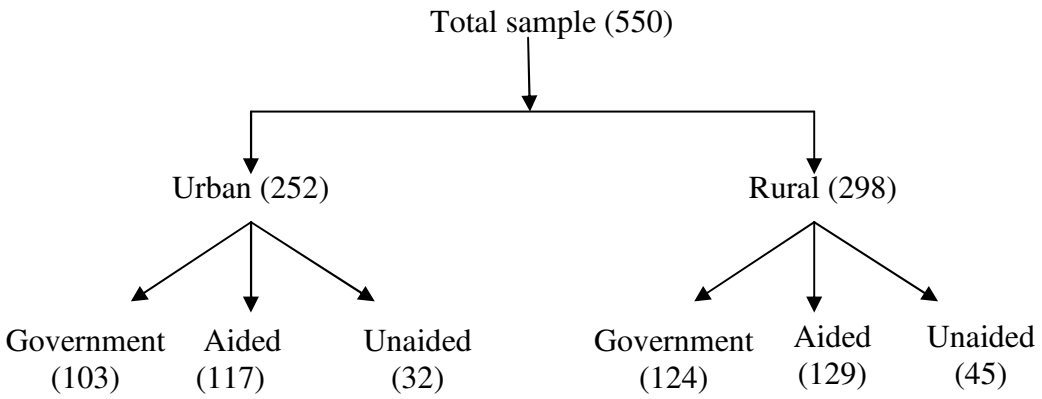

Figure 1. Break up of the basal sample

Instruments

The variable under study is Problem Solving Ability (PSA) in Mathematics which was measured using Mathematics Problem Solving Ability Test developed by the investigator with the help of her supervising teacher.

A Personal Data Sheet was also used to get information about the categorical variables viz., Gender, Birth order and Type of management of the school. The instruments used are described below.

Mathematics Problem Solving Ability Test

Polya (1945) defined Problem Solving Ability as finding a way out of a difficulty, a way around an obstacle, attaining an aim that was not immediately attainable. He offers four stages / steps of Problem Solving viz. understand the problem, devise the plan, carry out the plan and looking back. The Mathematics Problem Solving Ability Test was developed by the investigator based on the first three stages of Polya's (1945) Problem Solving which are explained below.

Understand the problem

To solve a problem a clear understanding of it is very essential. The learner has to identify what is asked and what information are given in the problem in order to solve it successfully. For this, he has to read the problem and if needed draw a picture or a diagram illustrating the problem.

Devise the plan

It is the second stage of Problem Solving. During this stage a learner will analyse the available information in the given problem / situation. He thinks about what information he has, what he is searching for and how to relate this information. Guess and test, use a variable as 'x', look for a pattern, make a list or table, use a model and use a formula are some of the familiar types of plans that can be used for solving a problem.

Carry out the plan

In order to solve the problem, persist with the chosen plan and try to solve the problem by using the chosen plan. That may lead to the final solution or correct answer. If it not work or not lead to the solution of the problem, discard that plan and chose another plan and continue. In this stage the correct solution of the problem will arise or get.

Though Polya suggested a fourth stage, looking back, which intends mainly a reflective thinking and future Problem Solving, it was not included in the present test.

The Mathematics Problem Solving Ability Test was prepared for seventh standard students of schools following Kerala syllabus. For this, the investigator analysed the SCERT Mathematics text books of lower standards and identified major content areas as arithmetic, geometry and algebra. The units and subunits selected under these areas are given as table 1.

Table 1

Units and subunits under the content areas- arithmetic, geometry and algebra

Content areas	Units	subunits
Arithmetic	Numbers	Operation on large numbers, place value, Ascending/ descending order of large numbers, Factors, Prime numbers/ composite numbers, multiples, least common multiple and highest common factor
	Fractions	Types of fractions, reducing to lowest terms, conversion of improper fraction to mixed numbers, conversion of mixed numbers to improper, comparison of fractions, addition, subtraction, multiplication and division of fraction
	Decimal fraction	Place value, comparison of decimal fraction, conversion of decimal fraction into common fraction, conversion of a common fraction into decimal fraction, addition, subtraction, multiplication and division of decimal fraction
	Average	concept of average, average of given numbers or quantities
	Percentage	To find out the percentage of a given quantity, expressing decimal as a percentage, expressing a fraction as a percentage, expressing percentage as a fraction and percentage as a decimal fraction
Geometry		Familiarising different geometrical figures and its features, concepts of angle, measuring and constructing angles, pairs of related angles, angles around a point, circle and its angle
	Area and perimeter	Concept of perimeter and area, perimeter and area of rectangles /square
	Volume	Concept of volume, volume of a rectangular prism
Algebra		Introduction to algebra

Item preparation

Items for the test was prepared considering the three steps of Problem Solving suggested by Polya (1945) viz., understand the problem, devise the plan and carry out the plan. For this 60 situations based on the selected units were formed and three questions on each situation for testing the mastery of the three steps were prepared. The first question under each situation deals with ability to understand the problem and it is in the form of a supply type objective question. The second one is a multiple choice question based on the step devise the plan and it contains various ways that student may adopt to solve the problem. Two or three options are given among which one is the most preferable one and the others are not leading to the correct solution. The third one is also a multiple choice question based on the step carry out the plan with four options.

A sample of the item is given below

Area : Arithmetic

Unit : Fraction

Subunit : Multiplication of a fraction by a whole number

Ramees bought three pieces of watermelon which weighed $\frac{3}{4}$ kg each. What is the total weight of watermelon Ramees bought?

- What is to be found out (understand the problem)

  .....

- Essential information to solve the problem (devise the plan)

a) Multiply number of pieces by $\frac{3}{4}$

b) Divide number of pieces by $\frac{3}{4}$

- Answer (carry out the plan)

a) 2kg b) $2\frac{1}{4}$ kg c) $2\frac{1}{2}$ kg d) $2\frac{3}{4}$ kg

For answering the first question respondent has to read the problem carefully and identify what is to be found out. The answer is expected to be written in the space provided. For answering the second and third question, respondent needs to encircle the correct option that leads to the solution.

The test was undergone scrutiny by experts to avoid ambiguity in statements. Suggestions of the experts were incorporated and items that are duplicated were deleted, resulting in a test with 47 items. This test was administered for five students of seventh standard to know whether they face any difficulty in the wording or procedure of the test.

Their feedback made the investigator to avoid questions on factors, prime numbers, composite numbers, multiples, least common multiple and highest common factor. These topics were found to be difficult for students. So the investigator consulted ten Mathematics teachers of both upper primary and secondary schools and enquired their opinion about the difficulty of the selected content areas. They confirmed the above said topics as difficult for majority of students.

Mathematics Problem Solving Ability Test measures the ability of students to apply the knowledge in solving problems. As the present test is not measuring the level of Mathematics achievement, it is assumed that the essential content knowledge needed for solving the problem is present among students. Hence the topics factors, prime numbers, composite numbers, least common multiple and highest common factor, where students are not having sufficient mastery were excluded from the test resulting in deletion of seven items. The selected units and subunits are given as table 2.

Table 2

Selected units and subunits of the content areas arithmetic, geometry and algebra.

Content areas	Units	Subunits
Arithmetic	Numbers	Operation on large numbers, place value, Ascending/ descending order of large numbers
	Fractions	Types of fractions, reducing to lowest terms, conversion of improper fraction to mixed numbers, conversion of mixed numbers to improper, comparison of fractions, addition, subtraction, multiplication and division of fraction
	Decimal fraction	Place value, conversion of decimal fraction into common fraction, conversion of a common fraction into decimal fraction, comparison of decimal fraction, addition subtraction multiplication and division of decimal fraction
	Average	Concept of average, average of given numbers or quantities
	Percentage	To find out the percentage of a given quantity, expressing decimal as a percentage, expressing a fraction as a percentage, expressing percentage as a fraction and percentage as a decimal fraction

Geometry		Familiarising different geometrical figures and its features, concepts of angle, measuring and constructing angles
	Area and perimeter	Concept of perimeter and area, perimeter and area of rectangle / square
	Volume	Concept of volume, volume of a rectangular prism
Algebra		Introduction to algebra

Thus the draft test contains 40 items with three subdivisions for each and is appended as Appendix I.

Try out

The investigator administered the Mathematics Problem Solving Ability Test in a sample of 370 seventh standard students of various schools from Kannur , Kozhikode and Malappuram districts. The answer sheets were scored by the investigator based on the prepared scoring key. For the first question if the identification of the problem is correct one mark is given without considering the accuracy of the language. If it is wrong zero mark is provided. For the second and third questions options are given and the students have to select the appropriate one. If the response is correct one mark is given for each item and zero mark for a wrong response. For each problem a maximum score of three (one for each question) will be obtained and the minimum is zero. Thus the total score obtainable for the test is 120 and the minimum is zero.

Item analysis

It is the process of finding item difficulty and discriminating power of each item in the Mathematics Problem Solving Ability Test. For that the 370 answer sheets were arranged in the order from highest score to the lowest score (descending order of total score). The highest scoring 27 percent of the total group (upper group) and the lowest scoring 27 percent of the total group (lower group) were identified and separated. The total scores for each item in the upper and lower group (100 in number) were found. Based on that, Mean and Standard deviation for each item was calculated and the discriminating power of the item was calculated by the formula,

$$t = \frac{\bar{x}_U - \bar{x}_L}{\sqrt{\frac{\sigma_U^2}{N_U} + \frac{\sigma_L^2}{N_L}}}$$

Where:

$\bar{X}_U$ = Mean of the upper group

$\bar{X}_L$ = Mean of the lower group

σ_U = Standard deviation of the upper group

σ_L = Standard deviation of the lower group

N_U = Sample size of the upper group

N_L = Sample size of the lower group

The difficulty index (or facility value) of each item was calculated using the formula,

$$FV = \frac{total\ score\ obtained\ by\ 370\ students\ in\ an\ item}{370 \times 3}$$

The detail of item analysis is given in table 3.

Table 3

Discriminating power and difficulty index of the items on Mathematics Problem Solving Ability Test (N=100)

Item number	Group	Mean	Standard Deviation	t-value	Difficulty index
1	U	2.61	0.60	8.30	0.70
	L	1.72	0.89		
2	U	2.65	0.54	13.19	0.66
	L	1.26	0.91		
3	U	2.54	0.56	9.22	0.68
	L	1.59	0.87		
4	U	2.20	0.62	10.99	0.52
	L	1.00	0.90		
5	U	1.76	0.69	7.42	0.47
	L	1.01	0.75		
6	U	2.70	0.50	14.64	0.68
	L	1.28	0.83		
7	U	2.29	0.64	8.55	0.61
	L	1.33	0.72		
8	U	1.95	0.70	9.35	0.47
	L	0.92	0.85		
9	U	2.10	0.81	8.73	0.54
	L	1.10	0.81		
10	U	2.35	0.72	15.37	0.52
	L	0.83	0.68		
11	U	1.22	0.84	2.88	0.37
	L	0.88	0.83		
12	U	2.38	0.83	9.61	0.59
	L	1.28	0.79		
13	U	2.10	0.79	9.20	0.51
	L	1.06	0.81		

Item number	Group	Mean	Standard Deviation	t-value	Difficulty index
14	U	1.79	0.69	10.75	0.43
	L	0.73	0.71		
15	U	1.92	0.93	6.93	0.49
	L	1.05	0.85		
16	U	2.03	0.93	8.87	0.48
	L	0.98	0.74		
17	U	2.13	0.66	11.40	0.52
	L	0.95	0.80		
18	U	2.24	0.74	8.76	0.58
	L	1.21	0.91		
19	U	2.60	0.59	14.86	0.64
	L	1.02	0.89		
20	U	2.31	0.66	12.13	0.60
	L	1.00	0.85		
21	U	2.19	0.73	11.12	0.56
	L	1.05	0.71		
22	U	1.53	0.83	6.16	0.41
	L	0.82	0.80		
23	U	2.45	0.76	10.48	0.61
	L	1.18	0.95		
24	U	2.46	0.66	11.72	0.59
	L	1.12	0.94		
25	U	2.17	0.78	14.48	0.51
	L	0.67	0.68		
26	U	1.67	0.84	7.82	0.42
	L	0.83	0.67		
27	U	1.70	0.77	10.08	0.40
	L	0.66	0.69		
28	U	1.89	1.04	8.84	0.44
	L	0.75	0.76		

Item number	Group	Mean	Standard Deviation	t-value	Difficulty index
29	U	2.23	0.85	13.15	0.50
	L	0.71	0.78		
30	U	2.01	0.79	9.80	0.49
	L	0.88	0.84		
31	U	2.23	0.78	13.50	0.50
	L	0.72	0.81		
32	U	1.97	0.72	10.49	0.47
	L	0.83	0.82		
33	U	0.99	0.99	3.49	0.19
	L	0.57	0.57		
34	U	1.95	0.99	8.05	0.46
	L	0.92	0.81		
35	U	1.82	0.74	9.27	0.44
	L	0.83	0.77		
36	U	1.84	0.84	9.66	0.45
	L	0.76	0.74		
37	U	1.59	0.83	6.23	0.41
	L	0.88	0.78		
38	U	1.60	0.84	5.86	0.43
	L	0.92	0.80		
39	U	1.98	0.78	11.67	0.48
	L	0.73	0.74		
40	U	2.23	0.77	10.56	0.56
	L	1.09	0.74		

Note. U - Upper group, L – Lower group

The items with t value greater than or equal to 2.58 was considered to have sufficient discriminating power. Discriminating power means the extent to which the given item discriminate among respondents who differ in the Problem Solving Ability measured by the test as a whole. Similarly, the items with facility value

between 0.4 and 0.6 are considered to be an ideal item. Among the 40 items, for 32 items facility value lies in between the range. Item number 1, 2, 3, 6, 19 and 23 have facility value greater than 0.6. These items are much easier to students. The facility value of the items 11 and 33 are smaller than 0.4 which are harder ones in the test. All the items are found to be having significant discriminating power.

To ensure the quality of the items, item-total correlation was calculated for each item. The details of item-total correlation are given in table 4.

Table 4

Item-total correlation on the scores of Mathematics Problem Solving Ability Test (N=370)

Item number	Correlation	Item number	Correlation
1	0.44	21	0.51
2	0.61	22	0.43
3	0.49	23	0.53
4	0.50	24	0.54
5	0.46	25	0.60
6	0.61	26	0.46
7	0.48	27	0.50
8	0.51	28	0.49
9	0.48	29	0.63
10	0.66	30	0.50
11	0.23	31	0.61
12	0.49	32	0.56
13	0.51	33	0.26
14	0.52	34	0.48
15	0.37	35	0.52
16	0.46	36	0.53
17	0.50	37	0.33
18	0.45	38	0.35
19	0.63	39	0.54
20	0.56	40	0.49

The correlation values of all the items are greater than 0.2 and hence can be selected for the final test.

In order to establish the quality of sub items of each item the investigator calculated the discriminating power (validity index) of each sub item using Falnagan's table of normalised biserial coefficients. The biserial r gives the correlation of an item score with total score on the test.

The difficulty index of the sub items for each item in the test was calculated by finding the average percentage of the number of correct responses in the top 27% and bottom 27% of the response sheets (Garrett, 2014, p.367).

The difficulty index and discriminating power of each sub item is given in the table 5.

Table 5

Difficulty index and validity index of each sub item

Item	% right in the top 27%	% right in the bottom 27%	Difficulty index	Validity index
t1.1	77	42	0.6	0.38
t1.2	97	68	0.83	0.55
t1.3	87	62	0.75	0.31
t2.1	87	33	0.60	0.54
t2.2	89	56	0.73	0.41
t2.3	89	37	0.63	0.57
t3.1	80	38	0.59	0.47
t3.2	82	49	0.66	0.36
t3.3	92	72	0.82	0.36
t4.1	93	27	0.60	0.71
t4.2	84	43	0.64	0.48
t4.3	53	30	0.42	0.25

Item	% right in the top 27%	% right in the bottom 27%	Difficulty index	Validity index
t5.1	88	35	0.62	0.6
t5.2	76	50	0.63	0.31
t5.3	32	16	0.24	0.20
t6.1	85	29	0.57	0.57
t6.2	87	37	0.62	0.48
t6.3	98	62	0.80	0.61
t7.1	78	23	0.51	0.56
t7.2	65	46	0.56	0.21
t7.3	96	61	0.79	0.6
t8.1	83	25	0.54	0.56
t8.2	65	45	0.55	0.21
t8.3	62	24	0.43	0.37
t9.1	84	28	0.56	0.57
t9.2	80	60	0.70	0.25
t9.3	49	22	0.36	0.31
t10.1	69	9	0.39	0.63
t10.2	86	43	0.65	0.45
t10.3	80	31	0.56	0.53
t11.1	80	29	0.55	0.53
t11.2	23	45	0.34	0*
t11.3	19	14	0.17	0.07*
t12.1	87	31	0.59	0.57
t12.2	73	52	0.63	0.22
t12.3	78	45	0.62	0.34
t13.1	87	39	0.63	0.51
t13.2	61	47	0.54	0.2
t13.3	62	20	0.41	0.42
t14.1	87	21	0.54	0.63
t14.2	15	16	0.16	0*
t14.3	77	36	0.57	0.43

Item	% right in the top 27%	% right in the bottom 27%	Difficulty index	Validity index
t15.1	78	47	0.63	0.34
t15.2	44	21	0.33	0.27
t15.3	70	37	0.54	0.33
t16.1	83	25	0.54	0.56
t16.2	62	38	0.50	0.25
t16.3	65	29	0.47	0.37
t17.1	46	7	0.27	0.53
t17.2	87	53	0.70	0.38
t17.3	80	35	0.58	0.49
t18.1	85	40	0.63	0.48
t18.2	78	53	0.66	0.27
t18.3	61	28	0.45	0.37
t19.1	78	28	0.53	0.49
t19.2	87	39	0.63	0.51
t19.3	95	35	0.65	0.66
t20.1	89	32	0.61	0.6
t20.2	89	27	0.58	0.65
t20.3	70	41	0.56	0.29
t21.1	84	27	0.56	0.6
t21.2	84	55	0.70	0.38
t21.3	51	23	0.37	0.31
t22.1	91	27	0.59	0.65
t22.2	37	29	0.33	0.09*
t22.3	25	26	0.26	0*
t23.1	78	29	0.54	0.49
t23.2	75	43	0.59	0.33
t23.3	92	46	0.69	0.59
t24.1	86	37	0.62	0.51
t24.2	67	35	0.51	0.33
t24.3	93	40	0.67	0.61

Item	% right in the top 27%	% right in the bottom 27%	Difficulty index	Validity index
t25.1	90	25	0.58	0.65
t25.2	61	29	0.45	0.33
t25.3	66	13	0.40	0.54
t26.1	78	15	0.47	0.63
t26.2	69	36	0.53	0.33
t26.3	31	12	0.22	0.22
t27.1	86	25	0.56	0.6
t27.2	49	22	0.36	0.31
t27.3	35	19	0.27	0.2
t28.1	48	13	0.31	0.42
t28.2	77	46	0.62	0.34
t28.3	64	16	0.40	0.49
t29.1	89	35	0.62	0.6
t29.2	68	20	0.44	0.49
t29.3	66	16	0.41	0.49
t30.1	89	18	0.54	0.71
t30.2	85	46	0.66	0.45
t30.3	67	24	0.46	0.41
t31.1	87	18	0.53	0.67
t31.2	74	36	0.55	0.37
t31.3	62	18	0.40	0.47
t32.1	88	28	0.58	0.63
t32.2	46	26	0.32	0.22
t32.3	73	27	0.50	0.48
t33.1	22	4	0.13	0.31
t33.2	32	16	0.24	0.2
t33.3	30	24	0.27	0.05*
t34.1	78	18	0.48	0.6
t34.2	69	40	0.55	0.29
t34.3	48	30	0.39	0.21

Item	% right in the top 27%	% right in the bottom 27%	Difficulty index	Validity index
t35.1	83	28	0.36	0.53
t35.2	35	18	0.27	0.20
t35.3	64	20	0.42	0.45
t36.1	71	11	0.41	0.63
t36.2	57	37	0.47	0.20
t36.3	65	22	0.44	0.45
t37.1	49	4	0.27	0.56
t37.2	54	29	0.42	0.25
t37.3	64	35	0.50	0.33
t38.1	80	22	0.51	0.6
t38.2	41	35	0.38	0.09*
t38.3	39	35	0.37	0.04*
t39.1	72	12	0.42	0.6
t39.2	66	33	0.50	0.33
t39.3	60	28	0.4	0.33
t40.1	84	24	0.54	0.6
t40.2	80	47	0.64	0.39
t40.3	55	38	0.48	0.2

*denotes deleted items

Table 5, shows that five items have sub items with validity index less than 0.2 and these items were rejected. The difficulty indices show that the test includes easy as well as difficult questions of almost equal weightage, the majority being of average difficulty. The items with numbers 11, 14, 22, 33 and 38 are rejected as they are found to have poor validity index. The final test thus contains 35 items and these items were rearranged according to the item difficulty. The final test (both Malayalam and English version) is given as Appendix II and III.

Scoring procedure

The scoring of the responses is to be done as follows. For the first question, if the identification of the problem is correct one mark is given without considering language accuracy. If it is wrong zero mark is provided. Options are given for the second and third questions and students have to select the most suitable or appropriate one among them. If the response is correct one mark is given for each item and zero mark is provided for a wrong response. The maximum score obtainable for an item is three and the minimum is zero. The total score obtainable for the test is 105 and the minimum is zero.

Reliability

The internal consistency of the test was calculated using Cronbach Alpha coefficient. The coefficient obtained is 0.94 and hence the test scores can be considered as reliable.

Test retest method was used to establish the consistency of the test over time. For this the test was administered on a group of 31 students of seventh standard and the same test was administered for the same group after 3 weeks. The Pearson's coefficient of correlation was calculated for the two sets of scores. The correlation coefficient obtained is 0.71 and hence the test scores are reliable.

Validity

A test is valid when the performance which it measures corresponds to the same performance as otherwise independently measured or objectively defined (Garrett, 2014, p.354).

The test has construct validity as it is prepared based on the steps of Problem Solving by Polya (1945).

The face validity was assured by considering the opinion of the experts in the field and also by conducting the preliminary testing. The test items are prepared based on the basic content areas and hence the prepared test has face validity.

The criterion related validity of the test was tested by correlating the scores of the present test with that of Test of Problem Solving Ability in Mathematics by Sumangala and Vijayakumari (2000) for a group of 31 students. The correlation coefficient obtained is 0.59 indicating that the test is valid to measure Problem Solving Ability in Mathematics.

Norms

For the future reference or comparison purpose the investigator reported the percentile norms. It is appended as Appendix IV.

Personal Data Sheet

The necessary information such as Gender, Birth order and Type of management of the school were collected by using a personal data sheet.

Data Collection Procedure

After preparing the Mathematics Problem Solving Ability Test, it was administered on the selected sample of seventh standard students' studying state syllabus from 14 schools of Kannur, Wayanad, Kozhikode, Malapuram, and

Palakkad districts of Kerala. The list of schools along with the sample size is attached as Appendix V.

To collect data, the investigator visited the schools and secured permission from the heads of the schools. The investigator explained the purpose of the study to the teachers and head of the institutions. After getting permission the test was administered by the investigator. Proper directions were given to the students about how to answer the questions in the test, with the help of an example. The personal data sheet containing the essential demographical details was also administrated.

All the answer sheets of Mathematics Problems Solving Ability Test were collected back and scored based on the prepared scoring key. The incomplete answer scripts were discarded and resulted in a final sample of 537 seventh standard students. Collected data was analysed with the help of SPSS software.

Statistical Techniques Used

Following statistical techniques were used to analyse the data.

Descriptive Statistics

Descriptive statistics like arithmetic mean, standard deviation, quartiles, percentiles and percentage were calculated for finding the extent of Problem Solving Ability in Mathematics.

Three way ANOVA (2×3×3)

Three way ANOVA (2×3×3) was used to find the main and interaction effects of Gender, Birth order and Type of management of the school on Problem

Solving Ability in Mathematics. The factor Gender has two subdivisions, girls and boys. First, second and later born were the three subdivisions of the second factor Birth order. The third factor Type of management of the school has three subdivisions viz., government, aided and unaided.

CHAPTER IV

ANALYSIS AND INTERPRETATION

- Descriptive Statistics
- Analysis of Variance
- Conclusion
- Tenability of Hypotheses

ANALYSIS AND INTERPRETATION

Analysis of data helps the investigator to test the hypotheses formulated and to reach at valuable results. The collected data has been analysed statistically by using descriptive statistics and three way ANOVA (2× 3× 3). The objectives set for the study and hypotheses formulated are given below:

Objectives

1. To develop a test on Problem Solving Ability in Mathematics
2. To find out the extent of Problem Solving Ability in Mathematics among upper primary school students
3. To find out main and interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics of upper primary School students.

Hypotheses

1. The main effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant
2. The interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant

The analyses done for realizing the objectives and testing the hypotheses are given under two sections viz., descriptive statistics and analysis of variance

Descriptive Statistics

To know the extent of Problem Solving Ability in Mathematics among upper primary school students, arithmetic mean, standard deviation and 95 percent confidence interval for mean were calculated for the total scores on Problem Solving Ability (PSA) and its components ability to understand the problem (PSA1), devise the plan (PAS2) and carry out the plan (PAS3). The quartiles and frequency (in percentage) of the minimum and maximum scores obtained for the total scores and its components were also estimated. The 50 percentage and 75 percentage of the maximum score on the test for the total PSA test and its components are 18 and 26 for the ability to understand the problem, 17 and 25 for devise the plan, 16 and 24 for carry out the plan and 49 and 74 for Problem Solving Ability in Mathematics. The percentage of students with score less than these values are also found out. The details are given as table 6.

Table 6

Preliminary details of Problem Solving Ability in Mathematics among upper primaryschool students

Variables	Minimum		Maximum		Mean	Standard Deviation	Quartiles			Percentage less than		95% confidence interval	
	Score	Percentage	Score	Percentage			Q1	Q2	Q3	50%	75%	Lower bound	Upper bound
PSA1	0	0.6	35	2	21.15	9.64	15	23	29	32	66.3	20.33	21.97
PSA2	0	0.2	33	0.6	19.87	4.88	17	20	23	30.9	87	19.46	20.28
PSA3	4	0.4	32	0.2	17.12	6.12	12	17	21	49.3	85.5	16.61	17.63
tOTAL	11	0.2	98	0.2	58.14	16.81	45.5	60	70	31.5	83.2	56.71	59.57

Results and Discussions

From table 6, the minimum score obtained for the students' ability to identify the problem (PSA1) is 0 and the maximum score is 35 with the percentage 0.6 and 2 respectively. That is, 0.6 percentage of the total group failed to identify the problem, whereas 2 percentage of the total group was successful in identifying all the problems in the test.

The first quartile obtained is 15 which mean that 25 percentage of the total group has score less than 15. The median (Q2) obtained is 23 which shows that 50 percentage of the total group has score less than 23 and the third quartile (Q3) obtained is 32, indicating that 25 percentage of the total group has score greater than 32.

The middle score for PSA1 on the test is approximately equal to 18 and the cumulative frequency (percentage) up to this point is 32, showing that 32 percentage of the students have scored less than 50 percentage of the total score on PSA1 or 68 percentage of students have scored more than 50 percentage of the total score on PSA1.

The 75 percentage of the score on PSA1 (35) is 26 and the cumulative frequency (percentage) up to this point is 66.3, which shows that 66.3 percentage of students have scored less than 75 percentage of the total score on the test or 33.7 percentage of the students have scored more than 26.

The mean score obtained is 21.15 with standard deviation 9.64. The 95 percent confident interval is (20.33, 21.97) which means that the probability that the mean score of PSA1 of the population may lie within this interval is 0.95.

The minimum score obtained for student's ability to devise the plan (PSA2) is 0 with the percentage 0.2 and the maximum score is 33 with the percentage 0.6. This indicates that 0.2 percentage of the total group failed in the second step, i.e., devise the plan.

The first quartile obtained is 17 which shows that 75 percentage of the total group has score more than 17 in PSA2. The median (Q2) obtained is 20 which means that 50 percent of the total group has score greater than 20 and the third quartile (Q3) obtained is 23 which shows that 75 percentage of the total group has score less than 23.

The 50 percentage of the score on PSA2 is 17 and the cumulative frequency (percentage) up to this point is 30.9, which means 30.9 percentage of students have secured less than 50 percentage of the total score on PSA2 or 69.1 percentage of students have secured more than 17 in PSA2.

The 75 percentage of the score on PSA2 is 25 and the cumulative frequency (percentage) up to this point is 87 which shows that 87 percentage of students have secured less than 75 percentage of the total score on PSA2 or 13 percentage of students have secured more than 25.

The mean and standard deviation obtained for PSA2 is 19.87 and 4.88 respectively. The 95 percent confidence interval for mean is (19.46, 20.28) that is,

the probability of the score is 0.95, that the population value lies between the limits 19.46 and 20.28.

The minimum score obtained for carry out the plan (PSA3) is 4 and the maximum score is 32 with the percentage 0.4 and 0.2 respectively. The first quartile (Q1) is 12 that means 25 percentage of the total group has score less than 12. The median (Q2) is 17 which shows that 50 percentage of the total group has score greater than 17, and the third quartile (Q3) obtained is 21, it indicated that 25 percentage of the total group has score greater than 21.

The approximate middle score on PSA3 is 16 and the cumulative frequency (percentage) up to this point is 49.3, which means that 49.3 percentage of the students have scored less than 50 percentage of the total score on PSA3 or 50.7 percentage of students have scored more than 50 percentage of the total score.

The 75 percentage of the total score on PSA3 is 24 and the cumulative frequency (percentage) up to this point is 85.5, that means 85.5 percentage of the students have scored less than 75 percentage of the total score on PSA3 or 14.5 percentage of students have scored more than 75 percentage of the total score.

The mean score of PSA3 is 17.12 and the standard deviation is 6.12. The 95 percent confidence interval of PSA3 is (16.61, 17.63) it is the probability that the mean score of the population may lies outside the above mentioned interval is less than or equal to 0.05.

The minimum and maximum scores obtained for the Problem Solving Ability (PSA) in Mathematics is 11 and 98 respectively. The percentage of students having the minimum score 11 is 0.2 and that for maximum score 98 is also 0.2.

The first quartile (Q1) obtained is 45.50 and it shows that 75 percentage of the total group has score greater than 45.50. The median (Q2) obtained is 60 which means 50 percentage of the total group has score greater than 60 and the third quartile (Q3) is 70 which means 25 percentage of the total group has score greater than 70.

The middle score or 50 percentage of the score on the total test is 49 and the cumulative frequency (percentage) up to this point is 31.5. This shows that 31.5 percentage of students have scored less than 50 percentage of the total score or 68.5 percentage of students have secured greater than 49.

The 75 percentage of the total score is 74 and the cumulative frequency up to this point is 83.2, this indicates 83.2 percentage of students have scored less than 74 or 16.8 percentage of students have scored more than 75 percentage of the total score on the test.

The mean and standard deviation of the scores on PSA is 58.14 and 16.81 respectively. The 95 percent confidence interval for mean is (56.71,59.57) which means that the population mean score on Problem Solving Ability in Mathematics may lie in side this interval, the probability for it to lie beyond this interval being less than or equal to 0.05.

Analysis of Variance

Three way ANOVA (2× 3× 3) was used to test the significance of main and interaction effects of the variables Gender, Birth order and Type of management on Problem Solving Ability in Mathematics and its components.

The results of ANOVA for Gender, Birth order and Type of management with PSA1 (understand the problem) is given as table 7.

Table 7

Results of ANOVA for Gender, Birth order and Type of management with PSA1

Source	Df	Mean square	F
Gender	1	1107.68	15.71**
Birth order	2	67.04	0.95
Type of management	2	3472.78	49.24**
Gender * Birth order	2	33.56	0.48
Gender*Type of management	2	774.04	10.97**
Birth order*Type of management	4	76.69	1.09
Gender *Birth order *Type of management	4	75.35	1.07

**$p \leq 0.01$

Results and Discussions

From table 7, the F value obtained for Gender on students' ability to understand the problem (PSA1) is 15.71 which is greater than the tabled value of F (1,535) for significance at 0.01 level (6.69).Hence the main effect of Gender on PSA1 is significant at 0.01 level of significance. It shows that there exists significant difference in PSA1 between girls and boys.

The F value calculated for Birth order on students ability to understand the problem (PSA1) is 0.95 which is less than the tabled value F (2,534) for significance at 0.05 level (3.01). That is, the main effect of Birth order on PSA1 is not significant at 0.05 level of significance. It indicates that Birth order has no significant main effect on students' ability to understand the problem (PSA1) at 0.05 level.

The F value obtained for Type of management on PSA1 is 49.24 which is greater than the tabled value 4.65 for df (2,534) at 0.01 level. Hence the main effect of Type of management on PSA1 is significant at 0.01 level of significance. This implies that PSA1 differ significantly among government, aided and unaided upper primary school students.

The F value obtained for Gender and Birth order on PSA1 is 0.48 which is less than the tabled value 3.01 for df(2,534) at 0.05 level. This indicates that the interaction effect of Gender and Birth order on PSA1is not significant at 0.05 level. That is, at different levels of Birth order PSA1 do not differ significantly among girls and boys.

The F value calculated for Gender and Type of management on PSA1 is 10.97 which is greater than the tabled value of F(2,534) for significance at 0.01 level (4.65). This shows that the interaction effect of Gender and Type of management on PSA1 is significant at 0.01 level. That is, for different levels of Gender (girls and boys) PSA1 differ significantly among government, aided and unaided school students.

The F value obtained for Birth order and Type of management on PSA1 is 1.09 which is less than the tabled value of F(4,532) for significance at 0.05 level(2.39). This indicates that the interaction effect of Birth order and Type of management on PSA1 is not significant at 0.05 level. That is, at different levels of Birth order, PSA1 do not differ significantly among government, aided and unaided school students.

The F value obtained for Gender, Birth order and Type of management on PSA1 is 1.07 which is less than the tabled value 2.39 for df(4,532) at 0.05 level. It means that the interaction effect of Gender, Birth order and Type of management on PSA1 is not significant at 0.05 level. That is, at different levels of Gender and at different levels of Birth order PSA1 do not differ significantly among government, aided and unaided upper primary school students.

To know the difference in students' ability to understand the problem (PSA1) among government, aided and unaided upper primary school students Scheffe's test of post hoc analysis was done. The result of Scheffe's test is given as table 8.

Table 8

Results of Scheffe's test for multiple comparison on PSA1

Type of management	N	Subset	
		1	2
Government	223	18.62	
Aided	239	20.86	
Unaided	75		30.11

From table 8, it is revealed that unaided school students differ significantly on their ability to understand the problem (PSA1) with that of government and aided upper primary school students. That is, government-unaided and aided-unaided school students have difference in their ability to understand the problem. But government and aided upper primary school students show no difference in PSA1.

To know more about the interaction effect of Gender and Type of management on PSA1 the investigator has attempted its graphical representation as figure 2.

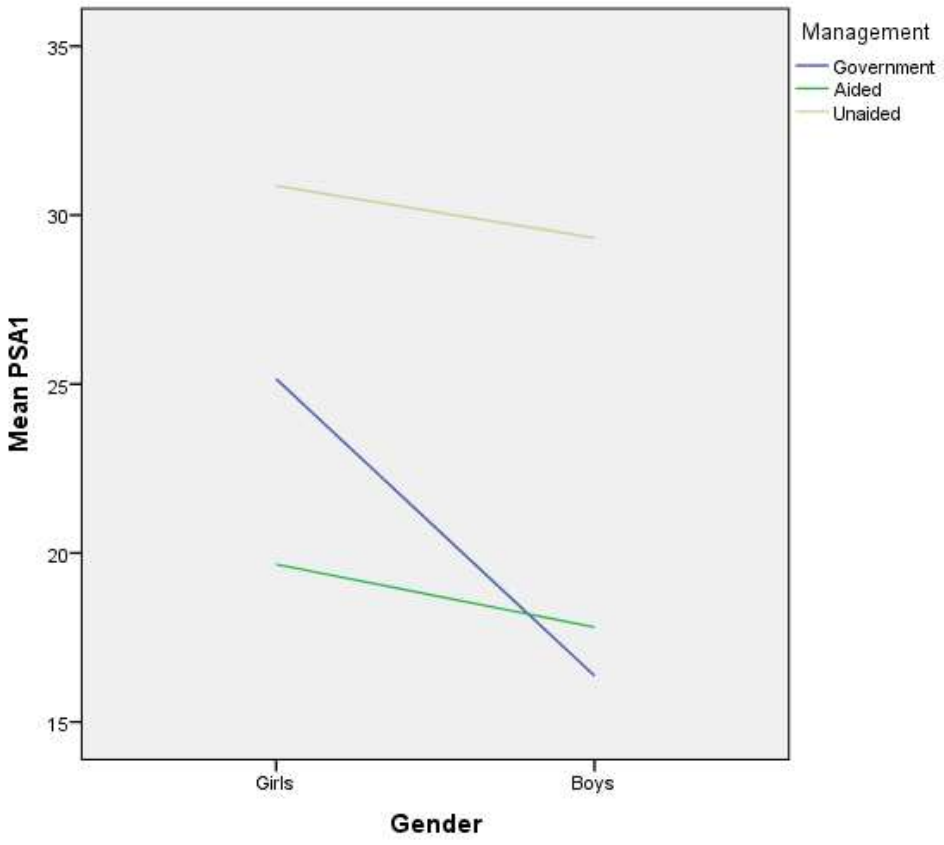

Figure 2. Graphical representation of the interaction effect of Gender and Type of management on students' ability to understand problem (PSA1).

From the figure 2, it can be found that there exist significant interaction effect for Gender between government and aided school students. It shows that aided school girls' ability to understand the problem is less than compare to that of government school girls and aided school boys have higher ability in PSA1 than that of government school boys. It also shows that unaided school girls and boys have no difference in their in PSA1. Their ability in PSA1 is more that of government and aided school students. Also girls of both government and aided schools score high on PSA1 than boys.

The results of ANOVA for Gender, Birth order and Type of management with PSA2 (devise the plan) is given in table 9.

Table 9

Results of ANOVA for Gender, Birth order and Type of management with PSA2

Source	df	Mean square	F
Gender	1	95.96	4.20*
Birth order	2	15.55	0.68
Type of management	2	128.14	5.60**
Gender * Birth order	2	2.34	0.10
Gender*Type of management	2	86.02	3.76*
Birth order*Type of management	4	24.95	1.09
Gender*Birth order*Type of management	4	17.18	0.75

**$p \leq 0.01$

*$p \leq 0.05$

Results and Discussions

From table 9, the F value obtained for Gender on students' ability to devise the plan (PSA2) is 4.20 which is greater than the tabled value 3.86 for df (1,535) at

0.05 level. It indicates that the main effect of Gender on PSA2 is significant at 0.05 level of significance. That is, there exists significant difference on PSA2 among upper primary girls and boys.

The F value obtained for Birth order on PSA2 is 0.68 which is less than the tabled value F (2,534) for significance at 0.05 level (3.01). Hence the main effect of Birth order on PSA2 is not significant at 0.05 level of significance. It means that Birth order has no main effect on the component ability to devise the plan at 0.05 level.

The F value obtained for Type of management on PSA2 is 5.60 which is greater than the tabled value 4.65 for df (2,534) at 0.01 level. That is, the main effect of Type of management on PSA2 is significant at 0.01 level of significance. It shows that there exist significant difference on PSA2 among government, aided and unaided school students.

The F value calculated for Gender and Birth order on PSA2 is 0.10 which is less than the tabled value 3.01 for df (2,534) at 0.05 level. This indicates that the interaction effect of Gender and Birth order on PSA2 is not significant at 0.05 level. It shows that at different levels of girls and boys PSA2 do not differ significantly based on the Birth order of the students.

The F value obtained for Gender and Type of management on PSA2 is 3.76 which is greater than the tabled value of F (2,534) for significance at 0.05 level (3.01). It means that interaction effect of Gender and Type of management on PSA2

is significant at 0.05 level. That is, at different levels of Gender PSA2 differ significantly among government, aided and unaided school students.

The F value obtained for Birth order and Type of management on PSA2 is 1.09 which is less than the tabled value of F (4,532) for significance at 0.05 level (2.39). It means that the interaction effect of Birth order and Type of management on PSA2 is not significant at 0.05 level. That is, at different levels of Type of management, PSA2 do not differ based on the Birth order of the students.

The F value calculated for Gender, Birth order and Type of management on PSA2 is 0.75 which is less than the tabled value 2.39 for df (4,532) at 0.05 level. It indicated that the interaction effect of Gender, Birth order and Type of management is not significant at 0.05 level. That is, at different levels of Gender and at different levels of management PSA2 do not differ significantly based on the Birth order of the student.

To know the difference in students' ability to devise the plan (PSA2) among government, aided and unaided upper primary school students, Scheffe's test of post hoc analysis was done. The result of Scheffe's test is given as table 10.

Table 10

Results of Scheffe's test for multiple comparison on PSA2

Type of management	N	Subset	
		1	2
Government	223	19.60	
Aided	239	19.61	
Unaided	75		21.49

From table 10, it is revealed that unaided school students differ significantly (0.05 level) on their ability to devise the plan (PSA2) with that of government and aided upper primary school students. But government and aided upper primary school students show no difference in PSA2.

To know more about the interaction effect of Gender and Type of management on PSA2 the investigator has plotted its graphical representation as figure 3.

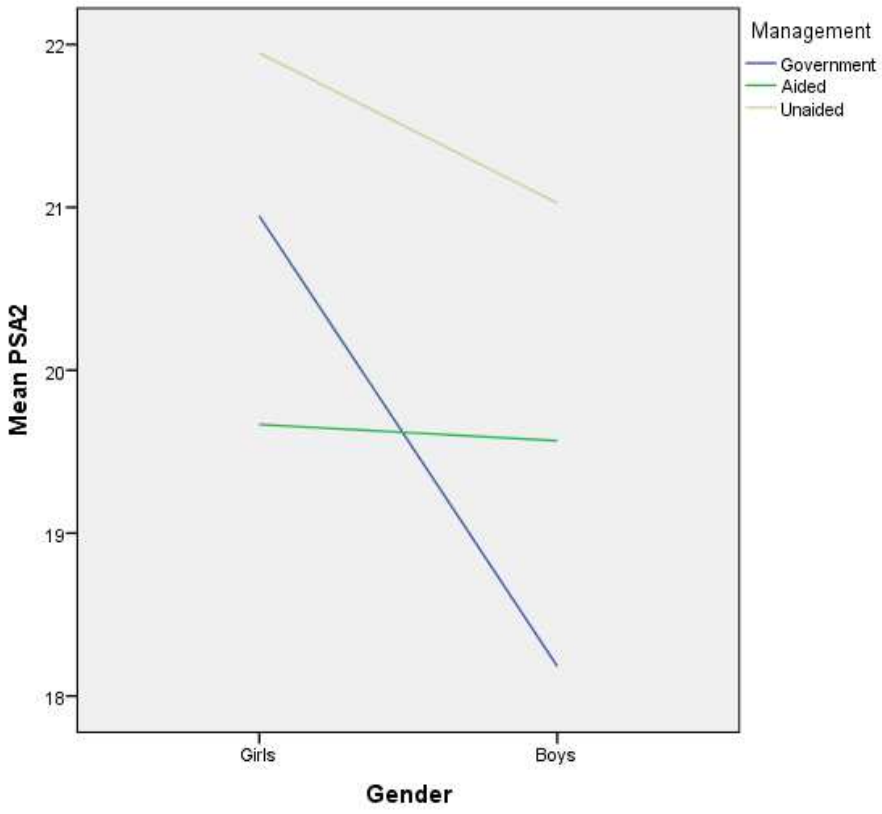

Figure 3. Graphical representation of the interaction effect of Gender and Type of management on students' ability to devise the plan (PSA2).

From the figure 3, it can be seen that there exist significant interaction effect of Gender between government and aided school students. It indicates that at different levels of management students' ability to devise the plan differ between

girls and boys. It also shows that government school girls are higher in their ability to devise the plan than that of aided school girls but government school boys ability in PSA2 is lower than that of aided school boys.

The results of ANOVA for Gender, Birth order and Type of management with PSA3 (carry out the plan) is given as table 11.

Table 11

Results of ANOVA for Gender, Birth order and Type of management with PSA3

Source	Df	Mean square	F
Gender	1	3.17	0.09
Birth order	2	57.53	1.61
Type of management	2	327.40	9.16**
Gender * Birth order	2	9.85	0.28
Gender*Type of management	2	180.74	5.06**
Birth order*Type of management	4	115.79	3.24*
Gender*Birth order*Type of management	4	8.90	0.25

**$p \leq 0.01$

*$p \leq 0.05$

Results and Discussions

From table 11, the F value obtained for Gender on students ability to carry out the plan (PSA3) is 0.09 which is less than the tabled value of F(1,535) for significance at 0.05 level (3.86). Hence the main effect of Gender on PSA3 is not significant at 0.05 level of significance. It means that there exists no significant difference in PSA3 between boys and girls.

The F value obtained for Birth order on PSA3 is 1.61 which is less than the tabled value F (2,534) for significance at 0.05 level (3.01).That is, the main effect of

Birth order on PSA3 is not significant at 0.05 level of significance. It means that Birth order has no significant effect on ability to carry out the plan (PSA3) at 0.05 level.

The F value obtained for Type of management on PSA3 is 9.16 which is greater than the tabled value 4.65 for df (2,534) at 0.01 level. Hence the main effect of Type of management on PSA3 is significant at 0.01 level of significance. It implies that PSA3 differ significantly among government, aided and unaided upper primary school students.

The F value obtained for Gender and Birth order on PSA3 is 0.28 which is less than the tabled value 3.01 for df (2,534) at 0.05 level. This indicates that the interaction effect of Gender and Birth order on PSA3 is not significant at 0.05 level. That is, at different levels of Gender PSA3 do not differ significantly based on the Birth order of the upper primary school students.

The F value obtained for Gender and Type of management on PSA3 is 5.06 which is greater than the tabled value of F (2,534) for significance at 0.01 level (4.65). It means that the interaction effect of Gender and Type of management on PSA3 is significant at 0.01 level. That is at different levels of Gender PSA3 differ significantly among government, aided and unaided school students.

The F value obtained for Birth order and Type of management on PSA3 is 3.24 which is greater than the tabled value of F(4,532) for significance at 0.05 level (2.39). It indicates that the interaction effect of Birth order and Type of management on PSA3 is significant at 0.05 level. That is at different levels of Management

(government, aided and unaided) PSA3 differ significantly based on the Birth order of the Students.

The F value calculated for Gender, Birth order and Type of management on PSA3 is 0.25 which is less than the tabled value 2.39 for df (4,532) at 0.05 level. It indicates that the interaction effect of Gender, Birth order and Type of management on PSA3 is not significant at 0.05 level. That is, at different levels of Gender and at different levels of management PSA3 do not differ significantly based on the Birth order of students.

To know the difference in students' ability to carry out the plan (PSA3) among government, aided and unaided upper primary school students Scheffe's test of post hoc analysis was done. The result of Scheffe's test is given as table 12.

Table 12

Results of Scheffe's test for multiple comparison on PSA3

Type of management	N	Subset	
		1	2
Government	223	16.45	
Aided	239	17.08	
Unaided	75		19.37

From table 12, it is revealed that unaided school students differ significantly on their ability to carry out the plan (PSA3) with that of government and aided upper primary school students. That is government-unaided and aided-unaided school

students have difference in PSA3. But government and aided upper primary school students shows no difference in PSA3.

To know more about the interaction effect of Gender and Type of management on PSA3 the investigator has attempted its graphical representation as figure 4.

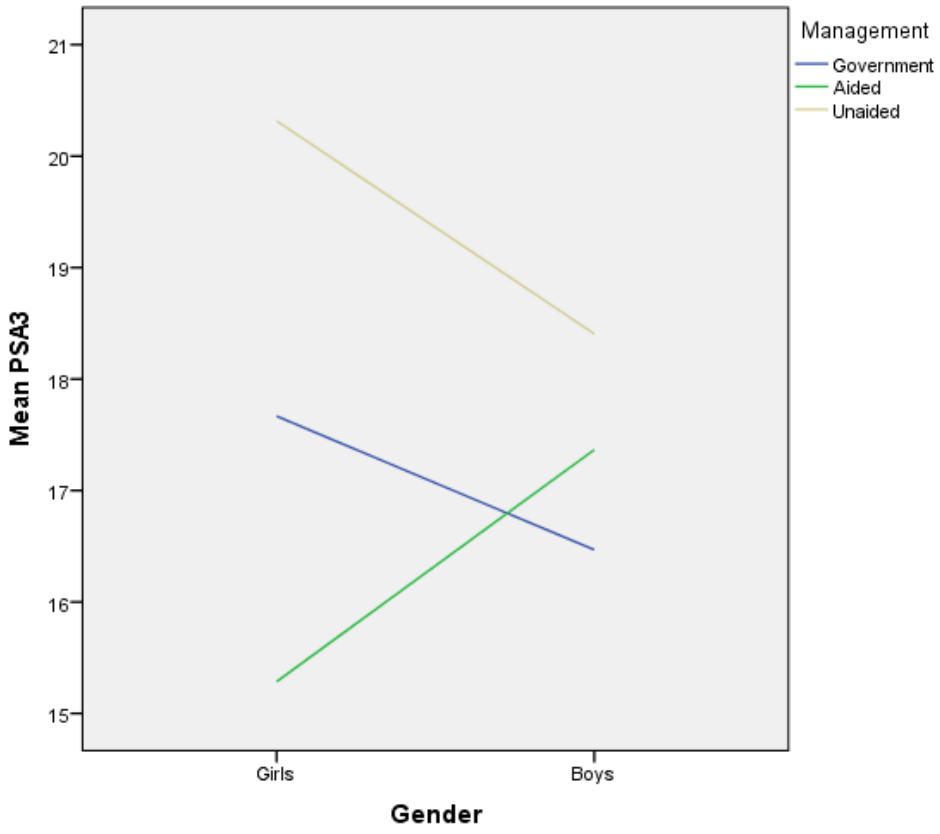

Figure 4. Graphical representation of the interaction effect of Gender and Type of management on students' ability to carry out the plan (PSA3).

From the figure 4, it can be seen that, there exist significant difference between government and aided school girls and boys. That is at different levels of management girls and boys show difference in PSA3. Government school girls have higher ability to carry out the plan that of aided school girls. Ability to carry out the

plan is more in aided school boys than government school boys. But unaided school girls and boys have higher ability in PSA3 when compared to government and aided school girls and boys. It also seen that unaided girls have higher ability in PSA3 than its boys.

To know more about the interaction effect of Birth order and Type of management on PSA3 the investigator has plotted its graphical representation as given in figure 5.

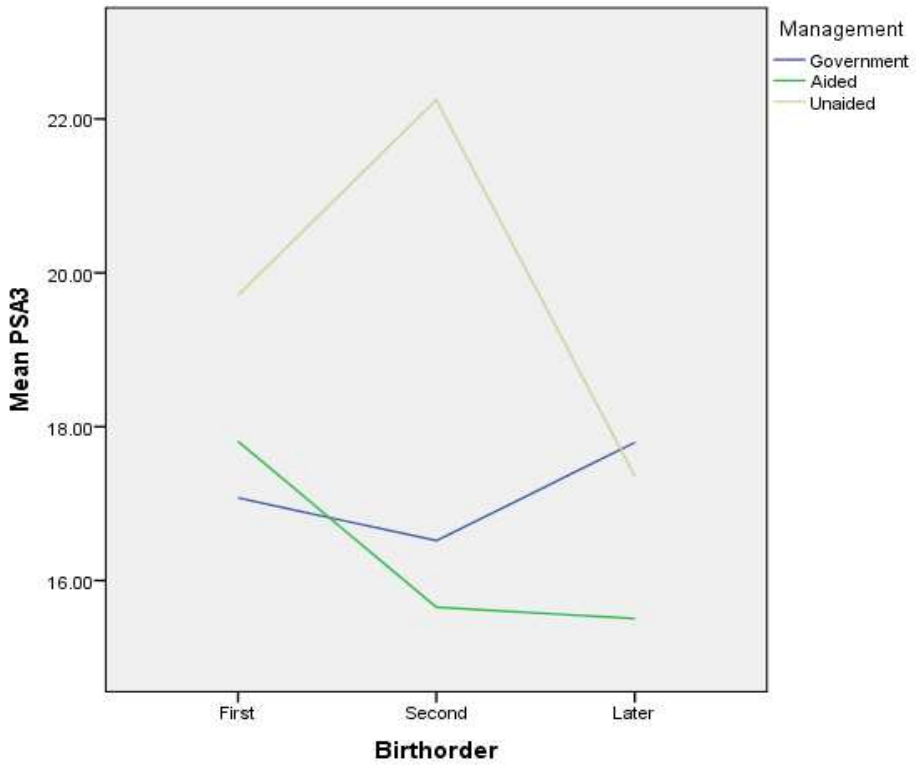

Figure 5. Graphical representation of the interaction effect of Birth order and Type of management on students' ability to carry out the plan (PSA3).

From the figure 5, it can be seen that there exists significant difference between government, aided and unaided schools among first, second and later born students. That is at different levels of Type of management (government, aided and

unaided) first born, second born and later born students have difference in their ability to carry out the plan. It also shows that first born aided school students are higher in PSA3 than first born government school students, but second and later born government school students have higher ability in PSA3 that of second and later born aided school students.

The results of ANOVA for Gender, Birth order and Type of management with Problem Solving Ability in Mathematics is given as table 13.

Table 13

Results of ANOVA for Gender, Birth order and Type of management with Problem Solving Ability in Mathematics

Source	df	Mean square	F
Gender	1	2012.29	8.50**
Birth order	2	216.27	0.91
Type of management	2	7739.87	32.69**
Gender * Birth order	2	95.96	0.41
Gender*Type of management	2	2241.18	9.47**
Birth order*Type of management	4	499.14	2.11
Gender*Birth order*Type of management	4	198.99	0.84

**$p \leq 0.01$

Results and Discussions

From table 13, the F value obtained for Gender on Problem Solving Ability (PSA) in Mathematics is 8.50 which is greater than the tabled value 6.69 for df (1,535) at 0.01 level. Hence the main effect of Gender on PSA in Mathematics is significant at 0.01 level of significance. This implies that girls and boys have significant difference in their PSA in Mathematics.

The F value obtained for Birth order on Problem Solving Ability in Mathematics is 0.91 which is less than the tabled value F (2,534) at 0.05 level (3.01). That is, the main effect of Birth order on PSA in Mathematics is not significant at 0.05 level of significant. It means that Birth order has no significant effect on the Problem Solving in Mathematics at 0.05 level.

The F value obtained for Type of management on Problem Solving Ability in Mathematics is 32.69 which is greater than the tabled value 4.65 for df (2,534) at 0.01 level. It means, the main effect of Type of management on PSA in Mathematics is significant at 0.01 level of significance. It shows that there exist significant difference in PSA in Mathematics among government, aided and unaided upper primary school students.

The F value obtained for Gender and Birth order on students ability to solve problems in Mathematics is 0.41 which is less than the tabled value 3.01 for df (2,534) at 0.05 level. It means that at different levels of Gender, students ability to solve problems in Mathematics do not differ significantly with respect to the Birth order of the students.

The F value obtained for Gender and Type of management on PSA in Mathematics is 9.47 which is greater than the tabled value of F (2,534) for significance at 0.01 level (4.65). It means that the interaction effect of Gender and Type of management on PSA in Mathematics is significant at 0.01 level. That is at different levels of Gender PSA in Mathematics differ significantly among government, aided and unaided upper primary school students.

The F value obtained for Birth order and Type of management on PSA in Mathematics is 2.11 which is less than the tabled value of F (4,532) for significance at 0.01 level(2.39). It indicates that the interaction effect of Birth order and Type of management on PSA in Mathematics is not significant at 0.05 level. That is, at different levels of Type of management, PSA in Mathematics do not differ with respect to the Birth order of the students.

The F value obtained for Gender, Birth order and Type of management on PSA in Mathematics is 0.84 which is less than the tabled value 2.39 for df (4,532) at 0.05 level. It indicates that the interaction effect of Gender, Birth order and Type of management on PSA in Mathematic is not significant at 0.05 level. That is, at different levels of Gender and at different levels of management PSA in Mathematics do not differ significantly based on the Birth order of students.

To know the difference in Problem Solving Ability (PSA) in Mathematics among government, aided and unaided upper primary school students Scheffe's test of post hoc analysis' was done. The result of Scheffe's test is given as table 14.

Table 14

Results of Scheffe's test for multiple comparison on Problem Solving Ability in Mathematics

Type of management	N	Subset	
		1	2
Government	223	54.69	
Aided	239	57.53	
Unaided	75		70.97

From table 14, it is revealed that unaided school students differ significantly (0.05 level) on their Problem Solving Ability in Mathematics with that of government and aided upper primary school students. It indicates that, students studying in government-unaided and aided-unaided schools have difference in their PSA in Mathematics. But government and aided upper primary school students show no difference in their ability to solve problems in Mathematics

To know more about the interaction effect of Gender and Type of management on Problem Solving Ability in Mathematics the investigator has attempted its graphical representation as figure 6.

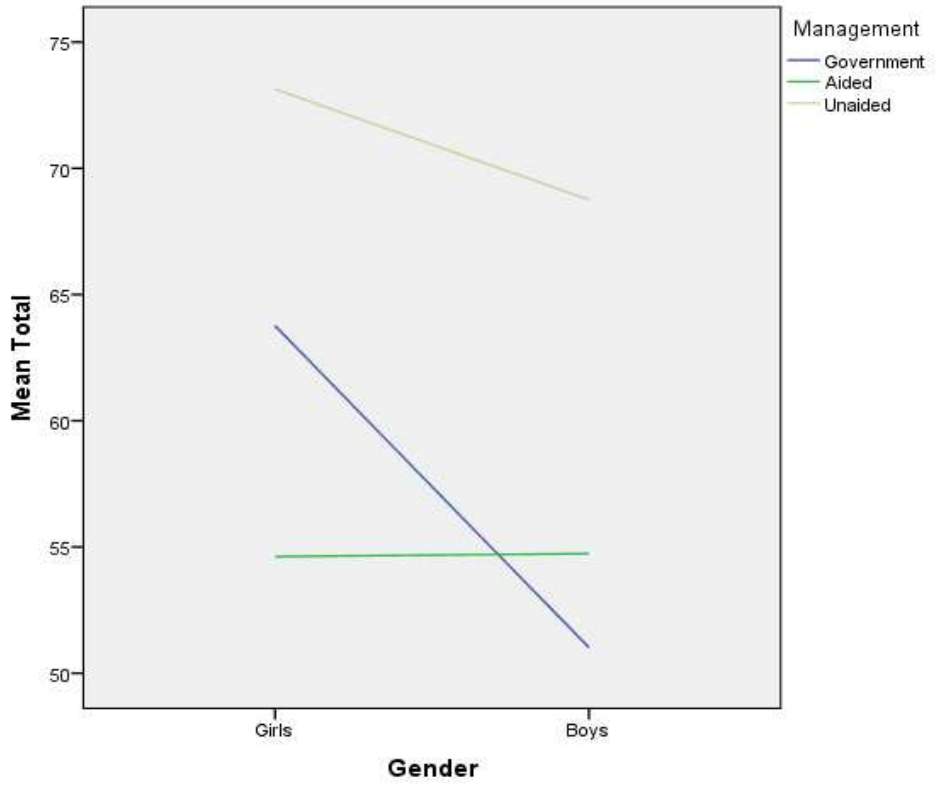

Figure 6. Graphical representation of the interaction effect of Gender and Type of management on Problem Solving Ability (PSA) in Mathematics

From the figure 6, it can found that there exist significant difference between government and aided school students for girls and boys. That is at different levels of management girls and boys have difference in their Problem Solving Ability in Mathematics. It shows that unaided school girls and boys ability to solve the problems in Mathematics is more that of government and aided upper primary school students. It also shows that government school girls have higher mathematical PSA than aided school girls but aided school boys PSA in Mathematics is higher than that of government boys.

The investigator found that the main effect of Gender on Problem Solving Ability in Mathematics is significant. This finding is concomitant with the studies of Smitha (2015), Arun(2013) and Parvathy (2002) but against the study of Lakshmi (1998). Also the finding of the present study the main effect of Type of management of the school on Problem Solving Ability in Mathematics is significant is matching with that of Arun (2013) but against the findings of the study conducted by Smitha (2015).

Conclusion

The results of descriptive statistics helped the researcher to conclude that upper primary school students have a satisfactory level of Problem Solving Ability in Mathematics. Students are found to be able to understand the problem and devise the plan for finding the solution at a satisfactory level, but they are not to the same level in carrying out the plan. This may be due to their difficulty in calculations or lack of concentration.

The results of ANOVA helped the investigator to conclude that girls and boys differ in their Problem Solving Ability in Mathematics. It revealed that government, aided and unaided upper primary school students have difference in their Problem Solving Ability in Mathematics. Unaided upper primary school students have higher Problem Solving Ability in Mathematics and in its components viz., ability to understand the problem, devise the plan and carry out the plan than government and aided schools students. Girls studying in government schools have higher Problem Solving Ability in Mathematics and its components than that of aided school girls. But government schools boys Problem Solving Ability in Mathematics and in its components are less than the aided school boys. It also helped to find out that first born aided upper primary school students ability to carry out the plan is higher than that of first born government school students but second and later born aided school students ability to carry out the plan is less than that of second and later government school.

Tenability of Hypotheses

Hypothesis 1, the main effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant

The findings of the study reveals that there exists significant main effect of Gender and Type of management of the school on Problem Solving Ability in Mathematics and its components viz., understand the problem, devise the plan and carry out the plan. But there is no significant main effect for Birth order on Problem Solving Ability (PSA) in Mathematics and its components viz., understand the

problem (PSA1), devise the plan (PSA2) and carry out the plan (PSA3). Hence the first hypothesis is partially substantiated.

Hypothesis 2, the interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant

The study shows that Gender and Type of management has significant interaction effect on Problem Solving Ability (PSA) in Mathematics and its components viz., understand the problem (PSA1), devise the plan (PSA2) and carry out the plan (PSA3). Gender and Birth order has no significant interaction effect on Problem Solving Ability in Mathematics and its three components PSA1, PSA2 and PSA3. The study also revealed that the two-way interaction for Birth order and Type of management on PSA in Mathematics and its two components PSA1 and PSA2 are not significant.But it has interaction effect on students' ability to carry out the plan (PSA3). The study also showed that the third order interaction for Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics and its components are not significant even at 0.05 level. Hence the second hypothesis is also partially substantiated.

CHAPTER 5

SUMMARY, FINDINGS AND SUGGESTIONS

- Study in Retrospect
- Major Findings
- Conclusion
- Educational Implications
- Suggestions for Further Research

SUMMARY, FINDINGS AND SUGGESTIONS

This chapter provides a brief idea about the study, major findings, educational implications and suggestions for further research.

Study in Retrospect

The study entitled as 'PROBLEM SOLVING ABILITY IN MATHEMATICS AMONG UPPER PRIMARY SCHOOL STUDENTS OF KERALA'.

Variables

The variable of the study is Problem Solving Ability in Mathematics. The categorical variables under study are Gender, Birth order and Type of management of the school.

Objectives

1. To develop a test on Problem Solving Ability in Mathematics
2. To find out the extent of Problem Solving Ability in Mathematics among upper primary school students
3. To find out the main and interaction effects of Gender, Birth order and Type of management of the school in Problem Solving Ability in Mathematics of upper primary school students.

Hypotheses

1. The main effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant.

2. The interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics are not significant

Participants

The study was conducted on a sample of 550, seventh standard school students of Kannur, Wayand, Kozhikode, Malappuram and Palakkad districts of Kerala.

Instruments

The instruments used for the study are

1. Mathematics Problem Solving Ability Test developed by the investigator.

2. Personal Data Sheet

Statistical Techniques Used

The following statistical techniques were used for the study

1. Descriptive statistics

2. Three way ANOVA(2×3×3)

Major Findings

1. Upper primary school students have satisfactory level of Problem Solving Ability in Mathematics(Mean= 58.14, S.D=16.81)

2. Students ability to understand the problem (Mean= 21.5, S.D=9.64) and devise the plan (Mean= 19.87, S.D=4.88) are satisfactory. But their ability to carry out the plan is moderate (Mean= 17.12, S.D=6.12).

3. The main effect of Gender on Problem Solving Ability in Mathematics is significant at 0.01 level (F=8.50).

4. The main effect of Gender on ability to understand the problem is significant at 0.01 level (F=15.71)

5. The main effect of Gender on ability to devise the plan is significant at 0.05 level (F=4.20).

6. The main effect of Gender on ability to carry out the plan is not significant at 0.05 level (F=0.09)

7. The main effect of Birth order on Problem Solving Ability in Mathematics is not significant at 0.05 level (F=0.91)

8. The main effect of Birth order on ability to understand the problem is not significant at 0.05 level (F=0.95)

9. The main effect of Birth order on ability to devise the plan is not significant at 0.05 level (F=0.68)

10. The main effect of Birth order on ability to carry out the plan is not significant at 0.05 level (F=1.61)

11. The main effect of Type of management of the school on Problem Solving Ability in Mathematics is significant at 0.01 level (F=32.69)

12. The main effect of Type of management on ability to understand the problem is significant at 0.01 level (F=49.24).

13. The main effect of Type of management on ability to devise the plan is significant at 0.01 level (F=5.60).

14. The main effect of Type of management on ability to carry out the plan is significant at 0.01 level (F=9.16).

15. Interaction effect of Gender and Birth order on Problem Solving Ability in Mathematics is not significant at 0.05 level (F=0.41).

16. The interaction effect of Gender and Birth order on students' ability to understand the problem is not significant at 0.05 level(F=0.48)

17. The interaction effect of Gender and Birth order on ability to devise the plan is not significant at 0.05 level (F=0.10).

18. The interaction effect of Gender and Birth order on ability to carry out the plan is not significant at 0.05 level (F=0.28).

19. The interaction effect of Gender and Type of management of the school on Problem Solving Ability in Mathematics is significant at 0.01 level(F=9.47)

20. The interaction effect of Gender and Type of management on students ability to understand the problem is significant at 0.01 level (F=10.97)

21. The interaction effect of Gender and Type of management on students ability to devise the plan is significant at 0.05 level (F=3.76)

22. The interaction effect of Gender and Type of management on students ability to carry out the plan is significant at 0.01 level (F=5.06)

23. The interaction effect of Birth order and Type of management of the school on Problem Solving Ability in Mathematics is not significant at 0.05 level (F=2.11).

24. The interaction effect of Birth order and Type of management on students' ability to understand the problem is not significant at 0.05 level (F=1.09).

25. The interaction effect of Birth order and Type of management on students' ability to devise the plan is not significant at 0.05 level (F=1.09).

26. The interaction effect of Birth order and Type of management on students' ability to carry out the plan is significant at 0.05 level (F=3.24).

27. The interaction effects of Gender, Birth order and Type of management on Problem Solving Ability in Mathematics is not significant at 0.05 level (F=0.84).

28. The interaction effects of Gender, Birth order and Type of management on ability to understand the problem, devise the plan and carry out the plan are not significant at 0.05 level (F=1.07, F=0.75, F=0.25 respectively)

Conclusion

The purpose of the study was to find out the extent of Problem Solving Ability in Mathematics among upper primary school students of Kerala and to find out the main and interaction effects of Gender, Birth order and Type of management of the school on Problem Solving Ability in Mathematics. The findings of the study revealed that students have a satisfactory level of Problem Solving Ability in Mathematics. It was also found that students' ability to understand the problem and devise the plan are satisfactory but their ability to carry out the plan is moderate. That is, most of the students succeeded in the first two steps of Problem Solving but they faced difficulty in carry out the plan.

The study also revealed that the main effect of Type of management of the school on Problem Solving Ability in Mathematics and on the three stages of Problem Solving is significant. It indicates that government, aided and unaided school students show difference in their Problem Solving Ability and in its three steps. And it also showed that unaided school students have higher Problem Solving Ability than that of government and aided upper primary school students.

From the study it was also found that the interaction effect of Gender and Type of management on Problem Solving Ability in Mathematics and ability to understand the problem, devise the plan and carry out the plan are significant. That is, at different levels of management girls and boys show difference in their ability to solve problems in Mathematics. The study also revealed that at different levels of Birth order students' ability to carry out the plan differ significantly among government aided and unaided upper primary school students.

Educational Implications

Unaided school students are found to be better problem solvers when compared to government and aided school students. This may be due to the special attention given by the teachers and the facilities they enjoy. A comparison including socio-economic status can only explain this excellence. Teachers of government and aided schools have to think about this situation and analyse the probable causes for lower level of Problem Solving Ability among their students. All in this area may be encouraged to have a reflection on the methods and approaches taken by the teachers is needed.

Most of the students were found to be successful in Problem Solving but many of them failed to carry out the devised plan. This may be due to lack of skill of computation and concentration. A close observation of the response sheets made it clear that many students committed errors due to lack of concentration. So, special attempts to increase the concentration power of students must be taken by the authorities. For this yoga and other meditation programmes may be organised for school students.

Teachers should take at most attention and providing challenging opportunities or problems to improve the Problem Solving Ability of students. Then only they will be willing to confront problems in their life. Mathematics teachers must provide an enriched environment in the classroom by including a variety of life related problems related to the content taught in the class. That will provide the students an insight or courage to solve their future problems

Text books committee also should try to include wide variety of problems at different levels instead of routine ones. Use of online resources for teaching and learning Mathematics must be encouraged in the school.

Suggestions for Further Research

The investigator put forward certain suggestions for the further studies in the field. They are

- The study can be replicated at different levels of education viz., secondary, higher secondary and higher education
- The present study was confined to five districts of Kerala. This can be extended to other districts also.
- Studies can be conducted to find out the relationship between Problem Solving Ability and other relevant Psychological variables.
- Studies can be conducted to prepare a module for developing Problem Solving Ability in Mathematics among students at various levels of education.
- The study can be replicated by including more demographic variables
- The study can be replicated among teachers and student teachers at various levels of education.

REFERENCES

REFERENCES

Anitha, B. (2003). *Certain affective and learning characteristics of successful problem solvers in Mathematics of secondary school pupils of Kerala* (Unpublished master's dissertation). Department of education, University of Calicut.

Aravind, A. B. P. (2013). *Relationship between science aptitude and problem solving ability in Chemistry among higher secondary school students* (Unpublished master's dissertation). Sree Narayana college of teacher education, Chelannur, University of Calicut.

Arun, P . (2013). *A study of mathematical problem solving ability of secondary school pupils of Malappuram district* (Unpublished master's dissertation). Devaki Amma memorial teacher education college, University of Calicut.

Asharani, K. , & Francis, A. (2015). Effect of vedic Mathematics on speed and accuracy in problem solving ability in Mathematics at secondary level. *GCTE Journal of Research and Extension in Education, 10*(1), 8-16

Avcu, S. & Avlu, R. (2010). Preservice elementary mathematics teachers use of strategies in mathematics problem solving. *Proceedia Social & Behavioural Sciences*, *9*, 1282-1286.

Bahar, A., & Maker, C. (2015). Cognitive background of Problem Solving ability – comparison of open - ended Vs closed Mathematics problems. *EURASIA*

Journal of Mathematics, Science and Technology Education, *7*(6), 1531-1546. EJ1078253

Baron, R. A. , & Misra, G. (2014). *Psychology*. New Delhi: Dorling Kindersley.

Budak, I. (2012). Mathematical profiles and problem solving of mathematically promising students. *Educational Research and Reviews,7*(16), 344-350. EJ982818

Chacko, A. (2013). *A study on the relationship between emotional intelligence and problem solving ability in Mathematics among secondary school students of Malappuram district*. (Unpublished master's dissertation). Sree Vivekananda college of teacher education, University of Calicut.

Cockcorft, W. H. (Ed) (1982). *Mathematics Counts*. Report of the committee of inquiry in to teaching Mathematics in school, London, Her Majesty's stationery Office. Retrieved from http://www.school-maths.info/1982_Mathematics_Counts.pdf

Deepa, R. P. (2012). *Effect of Co-operative learning on critical thinking and problem solving ability in Mathematics among higher secondary students*. (Doctoral thesis, Manonmaniam Sundaranar university). Retrived from http://hdl.handle.net/10603/40804

D'zurilla, T. J., Olivares, A.M., & Kant, G. L. (1998). Age and gender difference in social Problem Solving. *Personality and Individual Differnces, 25*(2), 241-252. http://doi: org/10.1016/s0191-8869.

Fawcett, L. M. , & Garton, A. F. (2005). The effect of peer collaboration on children's problem solving ability. *British Journal of Educational Psychology.75*(2),157-169. doi:10.1348/000709904x23411.

Gagne, R. M. (1965). *The conditions of learning*. New York: Holt, Rinehart &Winston. Retrieved from http://ocw.metuedu.tr/pluginfile.php/9013/mod rsource/sontent/1/driscoll-ch10%20%281%29.pdf

Garrett, H.E. (2014). *Statistics in psychology and education*. New Delhi: Surjeet

Guven, B., & Ozum, B.C. (2013). Factors influencing Mathematical problem solving achievemtnt of seventh grade Turkish students. *Learning and Individual Difference*, *23*,131-137. EJ1007765

George, S.,& Raj, S. H. (2011). Problem Solving and stress tolerance among teenagers: a correlational study. *Journal of Psychological Researchers, 55*(1&2), 1-5.

George, S. , Sanandaraj, S. , & Rajan, A. (2014).Gender difference and similarities in stress tolerance and Problem Solving among teenagers. *Journal of Psychological Researchers, 58*(2), 16-21.

Gray, J. S. (1956). Problem solving. In C.K. Skinner (Ed.), Educational psychology (3rd ed. , pp.374-376). Staples press: London

Griffin, C. C. , & Jitendra, A. K. (2009). Word problem solving instruction in inclusive third grade Mathematics classroom. *The Journal of Educational Research*, *102*(3), 187-202.

Haraidasan, N. K. (1989). *Study of the problem solving ability in biological science of high, average and low biology achievers at secondary school level.* (Unpublished master's dissertation) University of Calicut.

John, A. (2013). *A study on Problem Solving Ability in physical science of secondary school students* (Unpublished master's dissertation). Dr.Palpu memorial S.N.D.P Yogam college of education, Kodungallur, University of Calicut.

John, E. B. (2003). *Study on the social acceptance of successful and less successful problem solvers in Mathematics of standard IX pupils of Kerala.* (Unpublished master's dissertation). Department of education, University of Calicut.

Johnson, N. , & Ramganesh, E. (2012). A study on self regulatory awareness in physical science problem solving among the teacher trainees. *GCTE Journal of Research and Extension in Education, 7*(1), 69-73.

Jose, N. M. , & Thomas, R. P. (2011). Problem Solving Ability and scholastic achievement of secondary school students. *GCTE Journal of Research and Extension in Education,6*(1),141-144.

Karasel, N., Ayda, O. , & Tezer, M.(2010). Relationship between Mathematics anxiety and mathematical problem solving skills among primary school students. *Procedia- Social and Behavioural Sciences*, *2* (2), 5804-5807. Retrieved from http://www.sciencedirect.com/sciencearticle/pii/s187704228810009869

Kilpatrick. E. (1985). A retrospective account of the past twenty-five years of research on learning Mathematical problem solving: In E. A Silver (Ed), *Teaching and learning Mathematical problem solving: multiple research perspectives.*1-15.Hillsdale; NJ: Lawrence Elbaum Associate. http://www.amazon.in/Teaching-Learning-Mathematical-Problem-Solving/dp/0898596815#reader_0898596815

Kratas, I., & Baki, A. (2013). The effect of learning environments based on problem solving on students achievement of Problem Solving. *International Electronic Journal of Elementary Education*,*5*(3), 249-268. EJ1068620

Kumari, J. (2016). Problem solving ability of senior secondary school students. *Edutracks,15*(7),21-23.

Lakshmi, N. R. S. (1998). Construction of a problem solving ability test in Mathematics for secondary students and study the problem solving ability of students of class X in twin cities of Hyderabad [Abstract]. *Indian Educational Abstracts*, (4), 38-39.

Mayer, R. E. (1994). Problem soving and thinking development of learning skills in. In T. Husen & T. N. Postlethwaite (Eds.), *The international encyclopedia of education* (vol. 8, pp. 4722-4728). New York: Elsever science.

Merriam-Webster's Dictionary. Retrieved from https://www.merriam-webster.com/dictionary/problem

National Policy on Education. (1986). Government of India- Ministry of Human Research and Development, New Delhi. Retrieved from http://www.ncert.nic.in/ oth_anoun/npe86.pdf

National Curriculum Framework (2005). *Mathematics*. National Council of Educational Research and Training publication, New Delhi, p-42. Retrieved from http://www.ncert.nic.in/rightside/links/pdf/framework/english/nf2005.pdf

Newell, A., & Simon, H. (1972). Retrieved from Cognitive psychology.wikidot.lcom/cognition:problem-solving

Noushad, A. (1989). Effect of sex, locale and attitude towards problem solving on process outcomes in biology (Unpublished master's dissertation). University of Calicut.

Novak, E., & Tassell, J. Y. (2017). Pre service teacher math anxiety and Mathematics performance in geometry, word and non-word Problem Solving. *Learning and Individual Difference. 54*, 20-29. retrieved from http://www.sciencedirect.com/science/article/pii/s1041608017300055

Ornstein, A. C. (1990). *Institutionalized learning in America*. New Brunswick: Transaction. Retrieced from http://books.google.lco.in/books?isbn=1412826349

Panaoura, A. (2012). Improving Problem Solving Ability in Mathematics by using a mathematical model: a computerised approach. *Computers in Human Behaviour, 28* (6), 2291-2297.

Partnership for 21st century skills (2008). *21st century skills, education and competitiveness, a resource and policy guide*. Retrieved from www.21stcenturyskills.org

Parvathy, K. (2002). A study of problem solving ability in Mathematics of IX standard students of Palakkad District (Unpublished mater's dissertation). Farook training college, University of Calicut.

Piaget, J. (1971). The theory of stages in cognitive development. In D. R. Green, M. P Ford, & G. B. Flamer (Eds.) , *Measurement and Piaget*. New York: McGraw-Hill.

Pimta, S., Tayraukham, S. , & Nuangchalerm, P. (2009). Factors influencing mathematical Problem Solving Ability of sixth grade students. *Journal of Social Science, 5*(4), 381-385. ED506983

Polya, G. (1945). *How to solve it*. New Jersey: Princeton University Press. Retrieved from https://notendur.hi.is/hei2/teaching/Polya_HowToSolveIt.pdf

Prabha, S. (2006). Process of Problem Solving in Physics in the context of projective motion. *School Science*, *44* (3), 55-59.

Praveen, M. G. (2006). *Effect of mastery learning strategy on problem solving ability in Physics of secondary school students* (Unpublished Doctoral thesis). University of Calicut.

Praveen, M. G. (2017). *Preparation and validation of a schema based instructional module with MOODLE to foster problem solving ability in physics at higher*

secondary level (Unpublished Post doctoral thesis). Farook Training College, University of Calicut.

Rani, B. G. , & Begam, F. A. (2016). Problem solving ability and emotional intelligence of higher secondary students. *Journal of Educational Research and Extension, 53*(1), 47-57.

Sajeena, S. (2016). Relationship among creative thinking, problem solving and academic achievement of secondary school students. *GCTE Journal of Research and Extension in Education, 11*(1), 55-61.

Sameena, M. A. (2008). *Interaction effects of classroom climate and learning strategies on mathematical problem solving ability of secondary school students* (Unpublished master's dissertation). Farook training college, University of Calicut.

Smitha, K. (2015). *Relationship between Mathematics anxiety and problem solving ability in Mathematics among secondary school students of Kannur district*. (Unpublished master's dissertation). Devaki Amma memorial teacher education college, University of Calicut.

Spilde, A. (2013). *Mathematics in a second grade classroom: the effects of cognitively guided problem solving* (Master's dissertation, Arizona state university). ED553355.

Sreesan, N. K. (2013). *Effectiveness of reflective learning stragegy of problem solving ability in Accountancy of higher secondary school commerce*

students (Unpublished master's dissertation). Department of university of Calicut, University of Calicut.

Shreedevi, T. (2002). *Effects of certain demographic variables on the mathematical problem solving process sills of secondary school pupils of Kerala* (Unpublished master's dissertation). Department of education, University of Calicut.

Sternberg, R. J. (2007). *Cognitive psychology*. New Delhi: Akash

Sudha, P. V. (2013). *Effectiveness of gallery walk strategy on problem solving ability in Mathematics of standard VIII pupils* (Unpublished master's dissertation). M.C.T training college, Malappuram, University of Calicut.

Sumangala, V. , & Rinsa, P. V. (2012). Interaction effect of thinking styles and deductive reasoning on Problem Solving Ability in Mathematics of secondary school students. *Endeavours in Education, 3*(1), 44-48.

Swetha, V. P. (2013). *Relationship between scientific literacy and problem solving ability among secondary school pupils of Kozhikode district* (Unpublished master's dissertation). Calicut university teacher education centre Vatakara, University of Calicut.

Tambychick, T. , & Meerah, T. S. M. (2010). Students difficulties in Mathematics problem solving: what do they say? *Procedia Social and Behavioural Sciences*, 8, 142-151. retrieved from http://www.scinencedirect.com/science/article/pii/s1877042810021257

Tarim, K. (2009). Effects of cooperative learning on preschoolers Mathematics problem solving ability. *Educational Studies in Mathematics, 72*(3).325-340. EJ-861566.

Thampuratty, N. R., & Devi, G. (1996). Interaction effect of creativity, attitude towards problem solving and social position on achievement in mathematics of secondary school pupils [Abstract]. *Indian Journal of Abstract*, (1), 25-27.

Thasmi, A. S. (2013). *Effectiveness of Gagne's instructional strategy in enhancing problem solving skill among higher secondary school commerce students*. (Unpublished mater's dissertation). Sneha college of teacher education, Palakkad, University of Calicut.

Thomas, E. (2014). *Effectiveness of Polya's approach on problem Solving and problem creating ability in Mathematics of secondary school students* (Doctoral thesis, Mahathma Ghandi university). Retrieved from http://hdl.handle.net/10603/45119

Travers, K. J. , Pikaart. L. , Suydam, M. N., & Runion, G. (1977). *Mathematics teaching*. New York: Harper and Row.

Vaidya, N. (1968). *Problem Solving in science*. New Delhi: S. Chand.

Webster's encyclopedic unabridged dictionary of the English language (1996). (p.1146). New Jersey: Gramercy books. http://ocw.metu.edu.tr/pluginfile.php/9013/mod_resource/content/1/driscoll-ch10%20%281%29.pdf gagne

World Health Organization, Programme on mental health (1997). *Life skill education for children and adolescents*. Geneva, Switzerland. Retrieved fromhttp://apps.who.int/iris/bitstream/10665/63552/1/WHO_MNH_PSF_93.7A_Rev.2.pdf

APPENDICES

APPENDIX I

(Draft)

MATHEMATICS PROBLEM SOLVING ABILITY TEST (2017)

Std. VII Time : 2 Hours

Dr. K. Vijayakumari	Jidhina.K
Associate Professor	M.Ed Student
Farook Training College	Faoork Training College

Personal Data Sheet

Name of the student:	Name of the school:
Medium :	Gender : M / F
Religion : H /M / C	Birth order : First/Middle/Later
Occupation of father:	Occupation of mother:
Qualification of father:	Qualification of mother:

നിർദ്ദേശങ്ങൾ

നിത്യജീവിതവുമായി ബന്ധപ്പെട്ട ചില സന്ദർഭങ്ങളാണ് ചുവടെ ചോദ്യരൂപത്തിൽ നൽകിയിരിക്കുന്നത്. താഴെ നൽകിയിരിക്കുന്ന ഉദാഹണത്തെ അടിസ്ഥാനമാക്കി ചോദ്യങ്ങളുടെ ഉത്തരങ്ങൾക്ക് നേരെ ശരി (✓) അടയാളം രേഖപ്പെടുത്തുക. ആവശ്യമായവ പൂരിപ്പിക്കുകയും വേണം.

ഉദാഹരണം :

കായിക മത്സരത്തോട് അനുബന്ധിച്ച് നടന്ന ചാട്ടമത്സരത്തിൽ 13 വയസ്സുകാരൻ അമൽ 3.05 മീറ്ററും 12വയസ്സുകാരൻ ശ്യാമിൽ 3.50മീറ്ററും ചാടി. എങ്കിൽ ആരാണ് മത്സരത്തിൽ വിജയിച്ചത്.

- കണ്ടെത്തേണ്ട കാര്യം
  ആരാണ് കൂടുതൽ ദൂരം ചാടിയത്_____
- ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം
  a) കുട്ടികളുടെ വയസ്സ്
  ✓b) 3.05, 3.50 എന്നിവയിൽ വലുത് ഏതെന്ന അറിവ്
  c) മത്സര ഇനം
- ഉത്തരം
  a) അമൽ ✓ b) ശ്യാമിൽ c) രണ്ട് പേരും d) ആരും അല്ല

1) അപർണക്ക് ഒരു കുർത്ത തൈക്കുന്നതിന് $2\frac{1}{2}$ മീറ്റർ തുണി ആവശ്യമുണ്ട് ഇത്തരത്തിൽ 5 എണ്ണം തൈക്കുവാൻ എത്ര മീറ്റർ തുണി അപർണ വാങ്ങണം?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) കുർത്ത തൈക്കുന്നതിന് ആവശ്യമായ തുണിയുടെ അളവിനെ 5 കൊണ്ട് ഗുണിച്ച്
b) കുർത്ത തൈക്കുന്നതിന് ആവശ്യമായ തുണിയുടെ അളവിനെ 5 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

a) $12\frac{1}{2}$ മീറ്റർ b) $12\frac{2}{1}$ മീറ്റർ c) 10 മീറ്റർ d) ഇവയൊന്നും അല്ല

2) റഹീമിന്റെ വീട്ടിൽ നിന്നും 8.5 കിലോമീറ്റർ ദൂരമുണ്ട് അവൻ പഠിക്കുന്ന സ്കൂളിലേക്ക് എന്നും ആദ്യത്തെ കുറച്ച് ദൂരം സൈക്കിളിലും പിന്നീട് 5.4 കിലോമീറ്റർ ബസ്സിലുമാണ് അവൻ യാത്ര ചെയ്യാറുള്ളത്. എങ്കിൽ എത്ര കിലോമീറ്ററാണ് റഹീം സൈക്കിളിൽ സഞ്ചരിക്കുന്നത്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) ആകെ സഞ്ചരിച്ച ദൂരവും ബസിൽ സഞ്ചരിച്ച ദൂരവും പരിഗണിച്ച്

b) ആകെ സഞ്ചരിച്ച ദൂരം മാത്രം പരിഗണിച്ച്

- **ഉത്തരം**

a) 13.9 കിലോമീറ്റർ b) 3 കിലോമീറ്റർ c) 31 കിലോമീറ്റർ d) 3.1 കിലോമീറ്റർ

3) ഒരു മണിക്ക് ക്ലോക്കിലെ മണിക്കൂർ സൂചിയും മിനിറ്റ് സൂചിയും തമ്മിൽ ഉണ്ടാക്കുന്ന കോൺ 30^0 ആണ്. എങ്കിൽ 3 മണിക്ക് സൂചികൾ തമ്മിലുള്ള കോൺ എത്ര ഡിഗ്രി ആയിരിക്കും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) കോൺമാപിനി ഉപയോഗിച്ച് കോണളവ് കണ്ടെത്തുന്നു.

  b) ക്ലോക്കിലെ മണിക്കൂർ സൂചിയും മിനിറ്റ് സൂചിയും നിൽക്കുന്ന സംഖ്യകൾക്കിടയിലെ കോണളവ് തന്നിരിക്കുന്ന കോണളവുമായി ബന്ധപ്പെടുത്തി കണക്കാക്കുന്നു.

- **ഉത്തരം**

  a) 30^0 b) 45^0 c) 90^0 d) 135^o

4) റേഷൻ കടയിൽ നിന്ന് 4 കിലോഗ്രാം വീതം ലഭിക്കുന്ന ഗോതമ്പ് വാങ്ങാൻ 8 വീട്ടുകാർ ഒന്നിച്ച് എത്തി. കടയിൽ 30 കിലോഗ്രാം ഗോതമ്പ് മാത്രമേ അപ്പോൾ ഉണ്ടായിരുന്നുള്ളു. അത് തുല്യമായി വീതിച്ച് ഓരോരുത്തർക്കും കടക്കാരൻ നൽകി. എങ്കിൽ ഓരോ വീട്ടുകാർക്കും എത്ര കിലോഗ്രാം ഗോതമ്പ് കിട്ടും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെയുള്ള ഗോതമ്പിന്റെ അളവിനെ വീട്ടുകാരുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

  b) ആകെയുള്ള ഗോതമ്പിന്റെ അളവിനെ ഓരോരുത്തർക്കും ലഭിക്കുന്ന വിഹിതം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) $3\frac{6}{4}$ b) $3\frac{3}{4}$ c) $3\frac{4}{3}$ d) $3\frac{8}{6}$

5) ഒരു സ്കൂളിലെ 5-B യിൽ നിന്ന് 14 പേരും മറ്റു ക്ലാസ്സുകളിൽ നിന്നായി 216 പേരും ഉച്ചഭക്ഷണം കഴിക്കുന്നുണ്ട്. ഗവൺമെന്റ് ഒരു കുട്ടിക്ക് 150 ഗ്രാം അരിയാണ് നൽകുന്നത്. എങ്കിൽ ഒരു ദിവസം ആകെ എത്ര കിലോഗ്രാം അരി സ്കൂളിന് ആവശ്യമുണ്ട്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) സ്കൂളിൽ നിന്ന് ഉച്ചഭക്ഷണം കഴിക്കുന്ന കുട്ടികളുടെ ആകെ എണ്ണത്തെ 150 കൊണ്ട് ഹരിച്ച്

  b) സ്കൂളിൽ നിന്ന് ഉച്ചഭക്ഷണം കഴിക്കുന്ന കുട്ടികളുടെ ആകെ എണ്ണത്തെ 150 കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  a) 34.5 കി.ഗ്രാം. b) 3.45 കി.ഗ്രാം c) 345 കി.ഗ്രാം d) ഇവയൊന്നും അല്ല

6) മധുവും മുർഷിദും സ്കൂളിലെ കുട്ടികൾക്കായുള്ള പാൽവിതരണത്തിൽ അധ്യാപകനെ സഹായിക്കാറുണ്ട്. അത്തരത്തിൽ ഒരു ദിവസം വിതരണത്തിനുശേഷം 2 ലിറ്റർ പാൽ ബാക്കിയായി. അധ്യാപകൻ രണ്ട്പേർക്കും അത് തുല്യമായി വീതിച്ചു നൽകി. എങ്കിൽ ഓരോരുത്തർക്കും എത്ര ലിറ്റർ പാൽ വീതം ലഭിക്കും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ബാക്കിയായ പാലിന്റെ അളവിനെ കുട്ടികളുടെ എണ്ണം കൊണ്ട് ഗുണിച്ച്.

  b) ബാക്കിയായ പാലിന്റെ അളവിനെ കുട്ടികളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 1 ലിറ്റർ b) 2 ലിറ്റർ c) $\frac{1}{2}$ ലിറ്റർ d) $\frac{3}{4}$ ലിറ്റർ

7) നോട്ട് പുസ്തകത്തിന്റെ ഒരു പേജിനെ കോണോടു കോൺ മുറിച്ച് 2 കഷ്ണങ്ങൾ ആക്കിയാൽ കിട്ടുന്ന ഓരോ ഭാഗത്തിന്റെയും ആകൃതി എന്താണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) നോട്ട് പുസ്തകത്തിലെ പേജിന്റെ ആകൃതി ചതുരമാണ് എന്നത് പരിഗണിച്ച്.

  b) പേജിന്റെ ആകൃതി സമചതുരമാണ് എന്നത് പരിഗണിച്ച്.

- **ഉത്തരം**

  a) ചതുരം b) സമചതുരം c) ത്രികോണം d) ഇവയൊന്നും അല്ല

8) സ്കൂൾ തുറക്കുന്നതിനോടനുബന്ധിച്ച് അമ്മ ബെറ്റ്സി, ബെനില, ബെനിറ്റ എന്നിവർ ക്കായി 6 മീറ്റർ റിബ്ബൺ വാങ്ങി. എന്നിട്ട് അതിനെ $\frac{3}{4}$ മീറ്റർ നീളമുള്ള കഷണങ്ങൾ ആക്കി തുല്യമായി വീതിച്ച് എടുക്കാൻ ആവശ്യപ്പെട്ടു. എങ്കിൽ $\frac{3}{4}$ മീറ്റർ നീളമുള്ള എത്ര കഷ്ണങ്ങൾ ഉണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ വാങ്ങിയ റിബ്ബണിന്റെ നീളത്തെ $\frac{3}{4}$ കൊണ്ട് ഗുണിച്ച്.

  b) ആകെ വാങ്ങിയ റിബ്ബണിന്റെ നീളത്തെ $\frac{3}{4}$ കൊണ്ട് ഹരിച്ച്.

- **ഉത്തരം**

  a) 9 b) 7 c) 10 d) 8

9) പഞ്ചായത്തിലെ 7-ാം വാർഡിൽ ആകെ 2000 വോട്ടർമാരുണ്ട്. അതിൽ കഴിഞ്ഞ നിയമസഭ തിരഞ്ഞെടുപ്പിന് 65% പേർ വോട്ട് രേഖപ്പെടുത്തി. എങ്കിൽ എത്ര ആളുകൾ അന്നേദിവസം വോട്ട് ചെയ്തു?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ വോട്ടർമാരുടെ $\frac{65}{100}$ ഭാഗം എത്രയെന്ന് കണ്ട്

  a) ആകെ വോട്ടർമാരുടെ $\frac{35}{100}$ ഭാഗം എത്രയെന്ന് കണ്ട്

- **ഉത്തരം**

  a) 1400 b) 700 c) 1200 d) 1300

10) റമീസ് തന്റെ ബന്ധു വീടുകളിലേക്ക് കൊണ്ട് പോകുന്നതിനായി $\frac{3}{4}$ കിലോഗ്രാം ഭാരമുള്ള 3 കഷ്ണം തണ്ണിമത്തൻ വാങ്ങി. റമീസിന്റെ കൈവശം ആകെ എത്ര കിലോഗ്രാം തണ്ണിമത്തൻ ഉണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) കഷ്ണങ്ങളുടെ എണ്ണത്തെ $\frac{3}{4}$ കിലോഗ്രാം കൊണ്ട് ഗുണിച്ച്.

  b) കഷ്ണങ്ങളുടെ എണ്ണത്തെ $\frac{3}{4}$ കിലോഗ്രാം കൊണ്ട് ഹരിച്ച്.

- **ഉത്തരം**

  a) 2 കിലോഗ്രാം b) $2\frac{3}{4}$ കിലോഗ്രാം c) $2\frac{1}{4}$ കിലോഗ്രാം d) $2\frac{1}{2}$കിലോഗ്രാം.

11) യദു വ്യായാമത്തിനായി തന്റെ കൃഷിയിടത്തിന്റെ അതിരിലൂടെ എന്നും ഓടാറുണ്ട്. ഒരു വശത്തിന്റെ മൂലയിൽ നിന്ന് തുടങ്ങി അതിരിലൂടെ ഓടി തുടങ്ങിയിടത്ത് തന്നെ അവസാനിക്കുന്ന രീതിയിൽ എന്നും 5 റൗണ്ട് ആണ് യദു ഓടാറുള്ളത്. കൃഷിയിടത്തിന്റെ 4 അതിരുകൾക്കും തുല്യനീളമാണ്. ഇങ്ങനെ ഒരു ദിവസം 2000മീറ്റർ ഓടുന്നുവെങ്കിൽ കൃഷിയിടത്തിന്റെ ഒരു അതിരിന്റെ നീളം എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം ഗണിതഭാഷയിൽ**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) 4 × ഒരു വശത്തിന്റെ നീളം = 2000

  b) 5 × 4 × ഒരു വശത്തിന്റെ നീളം = 2000

  c) 5 × ഒരു വശത്തിന്റെ നീളം = 2000

- **ഉത്തരം**

  a) 400 b) 200 c) 500 d) 100

12) 20 ചാക്ക് സിമന്റിന്റെ തൂക്കം 1000 കിലോഗ്രാം ആണ്. എങ്കിൽ 16 ചാക്ക് സിമന്റിന്റെ തൂക്കം എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഒരു ചാക്ക് സിമന്റിന്റെ തൂക്കം കണ്ട് അതിനെ 16 കൊണ്ട് ഗുണിച്ച്

  b) 16നെ ആകെ തന്നിരിക്കുന്ന തൂക്കം കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

a) 16 കിലോ ഗ്രാം b) 800 കിലോ ഗ്രാം c) 16,000 കിലോ ഗ്രാം d) ഇവയൊന്നുമല്ല

13) സ്കൂളിലെ ഫുട്ബോൾ പരിശീലനത്തിന് ആകെ 110 കുട്ടികൾ പേര് നൽകി. അതിൽ നിന്നും സ്ക്രീനിങ്ങിന് ശേഷം 77 പേരെ ഒഴിവാക്കി. ബാക്കിയുള്ളവരെ 11 പേർ വീതമുള്ള ഗ്രൂപ്പുകളാക്കി തിരിച്ച് പരിശീലനം നൽകാൻ തീരുമാനിച്ചു. എങ്കിൽ ആകെ എത്ര ഗ്രൂപ്പുകൾ ഉണ്ടാവും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ പേര് നൽകിയവരുടെ എണ്ണത്തെ ഗ്രൂപ്പിലെ അംഗങ്ങളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

  b) സ്ക്രീനിങ്ങിന് ശേഷം ഒഴിവാക്കിയവരുടെ എണ്ണത്തെ ഗ്രൂപ്പിലെ അംഗങ്ങളുടെഎണ്ണം കൊണ്ട് ഹരിച്ച്

  c) സ്ക്രീനിങ്ങിലൂടെ തിരഞ്ഞെടുത്തവരുടെ എണ്ണത്തെ ഗ്രൂപ്പ് അംഗങ്ങളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 3 b) 7 c) 11 d) 4

14) വായന ദിനത്തിന്റെ ഭാഗമായി ആർട്സ് ക്ലബ്ബിന്റെ നേതൃത്വത്തിൽ ജി.വി.എച്ച്.എസ്ലെ. കുട്ടികൾ 2000 പുസ്തകങ്ങൾ ശേഖരിച്ച് സ്കൂളിന്റെ ഗ്രന്ഥശാലയിലേക്ക് നൽകുവാൻ തീരുമാനിച്ചു. ഇതിൽ 5-ാം ക്ലാസ്സിലെ രണ്ട് ഡിവിഷനുകൾ ആണ് കൂടുതൽ പുസ്തക ങ്ങൾ ശേഖരിച്ചത്. 5 A ഡിവിഷനിലെ 46 കുട്ടികൾ ചേർന്ന് 322 പുസ്തകങ്ങളും 5 B ഡിവിഷനിലെ 40 കുട്ടികൾ ചേർന്ന് 320 പുസ്തകങ്ങളും ഗ്രന്ഥശാലയിലേക്ക് നൽകി. ഏത് ക്ലാസിലെ കുട്ടികൾ ആണ് പുസ്തകം ശേഖരിച്ച് നൽകിയതിൽ മിടുക്കർ?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഓരോ ക്ലാസും ശേഖരിച്ച് നൽകിയ പുസ്തകങ്ങളുടെ ശരാശരി എണ്ണം പരിഗണിച്ച്

  b) രണ്ട് ഡിവിഷനുകളും ശേഖരിച്ച പുസ്തകങ്ങളുടെ എണ്ണം താരതമ്യം ചെയ്ത്

  c) ശേഖരിച്ച പുസ്തകത്തിന്റെ എണ്ണവും ക്ലാസിലെ കുട്ടികളുടെ എണ്ണവും താരതമ്യം ചെയ്ത്.

- **ഉത്തരം**

  a) A b) B c) രണ്ട് ഡിവിഷനുകളും d) ഇവയൊന്നുമല്ല

15) മകന്റെ വയസ്സിന്റെ മൂന്ന് മടങ്ങിനോട് രണ്ട് കൂട്ടിയാൽ അച്ഛന്റെ വയസ്സ് കിട്ടും. അച്ഛന്റെ വയസ്സ് എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) മകന്റെ വയസ്സ് x എന്ന് പരിഗണിച്ച് അച്ഛന്റെ വയസ്സ്

  b) അച്ഛന്റെ വയസ്സ് x എന്ന് പരിഗണിച്ച് അതിന്റെ 3 മടങ്ങിനോട് 2 കൂട്ടി

- **ഉത്തരം**

  a) അച്ഛന്റെ വയസ്സ് = x ÷ 3+2 b) അച്ഛന്റെ വയസ്സ് = 3x+2
  c) അച്ഛന്റെ വയസ്സ് = 3x-2 d) ഇവയൊന്നുമല്ല

16) സ്കൂൾ പ്രവേശനോത്സവത്തോട് അനുബന്ധിച്ച് തോരണം ഉണ്ടാക്കാൻ വിവിധ നിറത്തിലുള്ള 30 മീറ്റർ റിബ്ബണുകൾ വാങ്ങി. ഇതിൽ $\frac{3}{4}$ മീറ്റർ നീളത്തിൽ ചുവപ്പും $\frac{1}{2}$ മീറ്റർ നീളത്തിൽ വെള്ളയും $\frac{1}{4}$ മീറ്റർ നീളത്തിൽ പച്ച റിബ്ബണും ബാക്കിയായി. എങ്കിൽ ആകെ എത്ര മീറ്റർ റിബ്ബൺ ബാക്കി ഉണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ നീളത്തിൽ നിന്ന് $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ എന്നിവയുടെ തുക കുറച്ച്

  b) $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$, ഇവയുടെ തുക കണ്ട്

- **ഉത്തരം**

  a) $28\frac{1}{2}$ മീറ്റർ b) 1 മീറ്റർ c) 2 മീറ്റർ d) $1\frac{1}{2}$ മീറ്റർ

17) നോട്ട് പുസ്തകത്തിലെ ഒരു പേജിന്റെ 4 മൂലകളിലെയും കോണളവുകൾ എത്ര ഡിഗ്രി വീതമാണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ചതുരത്തിലെ 4 കോണുകൾ തുല്യവും മട്ടകോണും ആണെന്ന അറിവ്.

  b) ചതുരത്തിന്റെ എതിർ കോണുകൾ അനുപൂരകമാണ് എന്നറിവ്.

- **ഉത്തരം**

  a) 90^0 b) 45^0 c) 130^0 d) 50^0

18) ചതുരാകൃതിയിലുള്ള ഒരു പുരയിടത്തിന്റെ ഒരു വശത്തിന്റെ നീളം x മീറ്ററും വീതി y മീറ്ററും ആയാൽ പുരയിടത്തിന് ചുറ്റുമുള്ള വേലിയുടെ നീളം എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) നീളം x വീതി y എന്ന് പരിഗണിച്ച് പരപ്പളവ് കണ്ട്

  b) നീളം x വീതി y എന്ന് പരിഗണിച്ച് ചുറ്റളവ് കണ്ട്

- **ഉത്തരം**

  a) വേലിയുടെ നീളം = xy b) വേലിയുടെ നീളം = 2(x+y)

  c) വേലിയുടെ നീളം = 2x+y d) വേലിയുടെ നീളം = x+2y

19) അസ്മ, അഥീന എന്നിവർ അയൽക്കാരാണ്. കൂടാതെ ഓരോ അയൽക്കൂട്ടത്തിലെ അംഗങ്ങളും ഇടയ്ക്കിടയ്ക്ക് ഇവർ അയൽക്കൂട്ടത്തിൽ നിന്നും പണം കടം വാങ്ങാ റുണ്ട്. ഒരിക്കൽ കടം വാങ്ങിയ തുകയിൽ അസ്മ 5000 രൂപയും അഥീന, അസ്മ നൽകാനുള്ള തുകയുടെ 3 മടങ്ങും തിരിച്ച് കൊടുക്കണം. എങ്കിൽ എത്ര രൂപ അഥീന തിരിച്ച് നൽകണം?

കണ്ടെത്തേണ്ട കാര്യം

……

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) അസ്മ നൽകാനുള്ള തുകയോട് 3 കൂട്ടിയത്

  b) അസ്മ നൽകാനുള്ള തുകയെ 3 കൊണ്ട് ഗുണിച്ച്

  c) അസ്മ നൽകാനുള്ള തുകയെ 3 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) Rs.1,667 b) Rs.1,845 c) Rs.5,003 d) Rs.15,000

20) ഇഷ്ടിക കൊണ്ട് ഉണ്ടാക്കിയ ഒരു ടാങ്കിന്റെ അകത്തെ നീളം 3 മീറ്ററും വീതി 1.5 മീറ്ററും ആണ്. ടാങ്കിന് 1.6 മീറ്റർ ഉയരം ഉണ്ട്. എങ്കിൽ ടാങ്കിൽ എത്ര വെള്ളം കൊള്ളും?

കണ്ടെത്തേണ്ട കാര്യം

……

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ടാങ്കിന്റെ പരപ്പളവ് കണ്ട്

  b) ടാങ്കിന്റെ ഉള്ളളവ് കണ്ട്

  c) ടാങ്കിന്റെ ചുറ്റളവ് കണ്ട്

- **ഉത്തരം**

  a) 720 b) 7.2 c) 0.72 d) 72

21) ബാലുവിന് അടക്ക കച്ചവടമാണ്. ഇത്തവണ കിലോഗ്രാമിന് 145.50രൂപ പ്രകാരം 5.2 കിലോഗ്രാം അടക്ക ബാലു വിറ്റു. എങ്കിൽ അടക്കവിറ്റ ഇനത്തിൽ എത്ര രൂപ ബാലുവിന് കിട്ടും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഒരു കിലോഗ്രാം അടക്കയുടെ വിലയെ 5.2 കൊണ്ട് ഗുണിച്ച്

  b) ഒരു കിലോഗ്രാം അടക്കയുടെ വിലയെ 5.2 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) Rs.279.8 b) Rs.7566 c) Rs.756.6 d) Rs.2798

22) ഒരു ടിന്നിൽ 30 ബിസ്ക്കറ്റുണ്ടായിരുന്നു. അതിന്റെ $\frac{2}{5}$ ഭാഗം ജിനു എടുത്തു. റിയക്ക് ജിനുവിന് കിട്ടിയതിനേക്കാൾ 2 എണ്ണം കൂടുതൽ കിട്ടി. എങ്കിൽ റിയക്ക് എത്ര ബിസ്ക്കറ്റ് കിട്ടിയിട്ടുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) 30 ന്റെ പകുതിയോട് 2 കൂട്ടി

  b) 30 ന്റെ $\frac{2}{5}$ ഭാഗത്തോട് 2 കൂട്ടി

  c) 30 ന്റെ $\frac{2}{5}$ ഭാഗം കണ്ട്

- **ഉത്തരം**

  a) 14 എണ്ണം b) 12 എണ്ണം c) 17 എണ്ണം d) 18 എണ്ണം

23) സ്കൂൾ കലോൽസവത്തിന്റെ ഭാഗമായി പ്രധാനവേദിയിൽ കുട്ടികൾക്കായി ഇരിക്കാൻ 100 ബഞ്ചുകളും 50 കസേരകളും ഉണ്ട്. ഓരോ ബഞ്ചിലും 4 കുട്ടികൾ വീതം ഇരിക്കു ന്നു. ബാക്കി ഉള്ളവർ കസേരകളിലും കൂടാതെ സ്ഥലം ലഭ്യമല്ലാത്തതിനാൽ 20 പേർ നിന്നു പരിപാടി വീക്ഷിക്കുന്നു. എങ്കിൽ പ്രധാനവേദിയിൽ ആകെ എത്ര കുട്ടികൾക്ക് പരിപാടി വീക്ഷിക്കാനാവും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) $(100 \times 4) + 50 + 20$

  b) $100 \times (4 + 50) + 20$

- **ഉത്തരം**

a) 7400 b) 470 c) 5420 d) ഇവയൊന്നും അല്ല

24) 10 രൂപ ബസ്സ് ചാർജ് നൽകുന്നതിനു പകരം നിഖില 100 രൂപയുടെ നോട്ടാണ് നൽകി യത്. അതിൽ 10 രൂപ ചാർജ് ഇനത്തിൽ എടുത്ത ശേഷം ബാക്കി 50 രൂപയുടെ ഒരു നോട്ടും 10 രൂപയുടെ നോട്ടുകളും കണ്ടക്ടർ തിരിച്ച് നൽകി. എങ്കിൽ അതിൽ എത്ര 10 രൂപ നോട്ടുകൾ ഉണ്ടായിരിക്കും.

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) നൂറ് രൂപയിൽനിന്ന് 50 രൂപ കുറച്ച് കിട്ടുന്ന സംഖ്യയെ 10 കൊണ്ട് ഹരിച്ച്

b) നൂറ് രൂപയിൽ നിന്ന് 50 രൂപയും ബസ്സ് ചാർജും കുറച്ച് കിട്ടുന്ന സംഖ്യയെ 10 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

a) 5 b) 6 c) 4 d) 3

25) തീവണ്ടി രാത്രി 8.40ന് കോഴിക്കോട് സ്റ്റേഷനിൽ നിന്ന് പുറപ്പെട്ട് 9.45ന് തിരൂരിൽ എത്തുന്നു. എങ്കിൽ തീവണ്ടി കോഴിക്കോട് നിന്ന് തിരൂരെത്താൻ ആകെ എത്ര സമയം എടുത്തു?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) തീവണ്ടിയുടെ വേഗത നോക്കി.

b) തീവണ്ടി എത്തിച്ചേർന്ന സമയത്ത് നിന്നും തീവണ്ടി പുറപ്പെട്ട സമയം കുറച്ച്

c) തീവണ്ടി പുറപ്പെട്ടതും എത്തിച്ചേർന്നതും ആയ സമയങ്ങൾ കൂട്ടി.

- **ഉത്തരം**

a) 1.05 b) 17.85 c) 1.45 d) 17.00

26) മെഹറിൻ ആകെ ശമ്പളത്തിന്റെ $\frac{3}{10}$ ഭാഗം ആഹാരത്തിനും $\frac{1}{5}$ ഭാഗം കുട്ടികളുടെ വിദ്യാഭ്യാസത്തിനും $\frac{1}{10}$ ഭാഗം നിക്ഷേപമായും ചെലവാക്കുന്നു. എങ്കിൽ മറ്റാവശ്യങ്ങൾ ക്ക് ചെലവാക്കുന്നത് ശമ്പളത്തിന്റെ എത്രഭാഗമാണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) $\frac{1}{10}, \frac{1}{5}, \frac{3}{10}$ എന്നിവയുടെ തുക കണ്ട് അത് $\frac{10}{10}$ ൽ നിന്ന് കുറച്ച്.

  b) $\frac{1}{10}, \frac{1}{5}, \frac{3}{10}$ എന്നിവയുടെ തുക

- **ഉത്തരം**

  a) $\frac{6}{10}$ b) $\frac{5}{10}$ c) $\frac{3}{10}$ d) $\frac{4}{10}$

27) ഒരു ലിറ്റർ പെട്രോളിന് 67.50 രൂപയാണ്. വിനുവിന്റെ അച്ഛൻ 270 രൂപയ്ക്ക് പെട്രോൾ അടിച്ചു. എങ്കിൽ എത്ര ലിറ്റർ പെട്രോളാകും അദ്ദേഹം തന്റെ ബൈക്കിന് അടിച്ചിട്ടു ണ്ടാകുക?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഒരു ലിറ്റർ പെട്രോളിന്റെ വിലയെ 270 കൊണ്ട് ഹരിച്ച്

  b) ഒരു ലിറ്റർ പ്രെട്രോളിന്റെ വിലയെ 270 കൊണ്ട് ഗുണിച്ച്

  c) 270 നെ ഒരു ലിറ്റർ പ്രെട്രോളിന്റെ വില കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 4.5 ലിറ്റർ b) 5.0 ലിറ്റർ c) 4.0 ലിറ്റർ d) 5.5 ലിറ്റർ

28) ജി.എച്ച്.എസ്.എസിൽ 3127 കുട്ടികൾ പഠിക്കുന്നുണ്ട്. ഇതിൽ എട്ടാം ക്ലാസ്സിലെ 657 കുട്ടികൾ സ്കൂളിൽ നിന്നും വിനോദയാത്രക്ക് പോകുന്നു. യാത്രാ ചിലവിലേക്ക് യാത്ര പോകുന്ന ഓരോ കുട്ടിയിൽ നിന്നും 200 രൂപ വീതം വാങ്ങിയാൽ വിനോദയാത്രക്കായി ആകെ എത്ര രൂപ സ്കൂൾ സമാഹരിച്ചിട്ടുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) സ്കൂളിലെ ആകെ കുട്ടികളുടെ എണ്ണത്തെ ഒരു കുട്ടിക്ക് ചിലവാകുന്ന തുക കൊണ്ട് ഗുണിച്ച്

  b) വിനോദയാത്രക്ക് പോകുന്ന കുട്ടികളുടെ എണ്ണത്തെ ഒരാൾക്ക് ചിലവാകുന്ന തുക കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  a) Rs.131400 b) Rs.6254 c) Rs.1314 d) Rs.625400

29) മാധവ് കടയിൽ നിന്നു വിവിധ നിറത്തിലുള്ള 13 പേനകൾ വാങ്ങി പേനയുടെ വിലയായി ആകെ 32.50 രൂപ നൽകി. എങ്കിൽ ഒരു പേനയുടെ വില എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) പേനയുടെ വിലയെ പേനയുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

  b) പേനയുടെ എണ്ണത്തെ വിലകൊണ്ട് ഹരിച്ച്

  c) പേനയുടെ വിലയെ എണ്ണം കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  a) Rs.3.5 b) Rs.2 c) Rs.3 d) Rs.2.5

30) 7-ാം ക്ലാസിലെ 2 ഡിവിഷനുകളിലായി നടത്തിയ ഇംഗ്ലീഷ് പരീക്ഷയിൽ എ ഡിവിഷനിൽ 45ൽ 42 പേരും, ബി ഡിവിഷനിൽ 48ൽ 44 പേരും വിജയിച്ചു. ഏത് ഡിവിഷനിലാണ് മികച്ച വിജയം ലഭിച്ചിരിക്കുന്നത്.

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) 42, 44 ഇവയിൽ വലുത് കണ്ടെത്തി

  b) $\frac{42}{45}, \frac{44}{48}$ ഇവയിൽ വലുത് കണ്ടെത്തി

  c) $\frac{45}{42}, \frac{48}{44}$ ഇവിയിൽ വലുത് കണ്ടെത്തി

- **ഉത്തരം**

  a) B b) A c) രണ്ട് ഡിവിഷനിലും ഒരു പോലെ d) ഇതൊന്നുമല്ല

31) അടുക്കളത്തോട്ടത്തിൽ പാവലിന് പന്തൽ ഇടുന്നതിനായി വൈഷ്ണവ് 13.5 മീറ്റർ കയർ വാങ്ങി. ഇതിനെ 1.5 മീറ്റർ നീളത്തിൽ മുറിച്ച് കഷ്ണങ്ങളാക്കിയാണ് പന്തൽ ഒരുക്കിയത്. എങ്കിൽ 1.5 മീറ്റർ നീളത്തിലുള്ള എത്ര കഷ്ണം കയർ ലഭിക്കും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ വാങ്ങിയ കയറിന്റെ നീളത്തെ 1.5 കൊണ്ട് ഹരിച്ച്

  b) ഒരു കഷ്ണത്തിന്റെ നീളത്തെ ആകെ കയറിന്റെ നീളം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 6 മീറ്റർ b) 7 മീറ്റർ c) 8 മീറ്റർ d) 9 മീറ്റർ

32) റിപ്പബ്ലിക് ദിനത്തോടനുബന്ധിച്ച് സ്കൂളിൽ നൽകുന്നതിനായി 2000 മിഠായികൾ വാങ്ങി അവയെ 40 എണ്ണം വീതമുള്ള വിവിധ പാക്കറ്റുകളാക്കിയാണ് ക്ലാസുകളിലേക്ക് വിതരണം ചെയ്തത്. എങ്കിൽ അത്തരം എത്ര പാക്കറ്റുകൾ ഉണ്ടാകാം?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) മിഠായികളുടെ എണ്ണത്തെ 40 കൊണ്ട് ഗുണിച്ച്

  b) ആകെ മിഠായികുളടെ എണ്ണത്തെ ഒരു പാക്കറ്റിലെ മിഠായികളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്.

  c) ഒരു പാക്കറ്റിലെ മിഠായികളുടെ എണ്ണത്തെ ആകെ മിഠായികളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്.

- **ഉത്തരം**

  a) 500 b) 1000 c) 50 d) 80000

33) അധ്യാപിക നിങ്ങളോട് 9,0,2,3,8 എന്നീ എല്ലാ അക്കങ്ങളും ഒന്നിൽ കൂടുതൽ പ്രാവശ്യം ഉപയോഗിക്കാതെ എഴുതാൻ കഴിയുന്ന ഏറ്റവും ചെറിയ അഞ്ചക്ക സംഖ്യ എഴുതാൻ ആവശ്യപ്പെട്ടു എങ്കിൽ നിങ്ങൾ എഴുതുന്ന സംഖ്യ ഏത്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഏറ്റവും ചെറിയ അഞ്ച് അക്കസംഖ്യ ഏതെന്ന അറിവ്

  b) തന്നിരിക്കുന്ന സംഖ്യകൾ ഉപയോഗിച്ച് ഏറ്റവും ചെറിയ സംഖ്യ എഴുതാൻ സംഖ്യകളെ അവരോഹണക്രമത്തിൽ എഴുതണം എന്ന അറിവ്.

  c) പൂജ്യം രണ്ടാമത് വരത്തക്കരീതിയിൽ സംഖ്യകളെ ആരോഹണക്രമത്തിൽ എഴുതണമെന്ന അറിവ്

- **ഉത്തരം**

  a) 02389 b) 98302 c) 983220 d) 20389

34) പാർവ്വതി കിലോഗ്രാമിന് 32.50 പ്രകാരം 6 കി.ഗ്രാം അരിയും 28.50 പ്രകാരം 2 കി.ഗ്രാം പഞ്ചസാരയും വാങ്ങി. എങ്കിൽ ആകെ എത്ര രൂപ സാധനങ്ങൾക്കായി പാർവ്വതി ചിലവാക്കിയിട്ടുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) 1 കി.ഗ്രാം. പഞ്ചസാരയുടെയും അരിയുടെയും വിലകൾ കൂട്ടി

b) ആറ് കൊണ്ട് ഒരു കി.ഗ്രാം അരിയുടെ വില ഗുണിച്ച് അതിനെ 2 കൊണ്ട് ഗുണിച്ച ഒരു കി.ഗ്രാം പഞ്ചസാരയുടെ വില കൂട്ടി

- **ഉത്തരം**

a) Rs.248 b) Rs.61 c) Rs.252 d) Rs.65

35) മനു തന്റെ സേവിംഗ്സ് ബോക്സ് (ഹുണ്ടിക) പൊട്ടിച്ചപ്പോൾ അതിൽ 50 പൈസയുടെ 30 നാണയങ്ങളും 1 രൂപയുടെ 40 നാണയങ്ങളും 2 രൂപയുടെ 15 നാണയങ്ങളും 5 രൂപയുടെ 14 നാണയങ്ങളും 10 രൂപയുടെ 5 നാണയങ്ങളും ഉണ്ടായിരുന്നു. എങ്കിൽ ആകെ എത്ര രൂപ മനുവിന്റെ പക്കലുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) നാണയങ്ങളുടെ എണ്ണത്തെ അതിന്റെ മൂല്യം കൊണ്ട് ഗുണിച്ച് തുക കാണൽ

b) നാണയങ്ങളുടെ ആകെ മൂല്യം കണ്ട്

c) നാണയങ്ങളുടെ എണ്ണം കൂട്ടി.

- **ഉത്തരം**

a) Rs.205 b) Rs.230 c) Rs.104 d) Rs.220

36) 6-ാം ക്ലാസ് വിദ്യാർത്ഥികളായ മായ, മാസി, ഗാദ എന്നിവരുടെ ഉയരം ചുവടെ കൊടുക്കുന്നു. 140.01 സെന്റീമീറ്റർ, 140.40 സെന്റീമീറ്റർ, 140.05 സെന്റീമീറ്റർ ഉയര ക്രമത്തിൽ ഇവർ അസംബ്ലിക്ക് നിൽക്കുകയാണെങ്കിൽ എങ്ങനെയാകും നിൽക്കുക?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) ദശാംശ സംഖ്യകളെ അവരോഹണക്രമത്തിലെഴുതി

b) ദശാംശ സംഖ്യകളെ ആരോഹണക്രമത്തിലെഴുതി

- **ഉത്തരം**

a) മായ, ഗാദ, മാസി b) ഗാദ, മാസി, മായ

c) മാസി, മായ, ഗാദ d) മായ, മാസി, ഗാദ

37) ദേവികയുടെയും ഫാത്തിമയുടെയും വീടുകളിലെ കഴിഞ്ഞ 4 മാസത്തെ വൈദ്യുതി ഉപയോഗം (യൂണിറ്റിൽ) ചുവടെ കൊടുക്കുന്നു.

മാസം / വ്യക്തി	ഏപ്രിൽ	മെയ്	ജൂൺ	ജൂലായ്
ദേവിക	85	77	80	78
ഫാത്തിമ	78	89	70	80

ഇവരിൽ ആരുടെ കുടുംബമാണ് മറ്റുള്ളവർക്ക് മാതൃകയാകും വിധം ശരാശരി വൈദ്യുതി ഉപയോഗം നിയന്ത്രിക്കുന്നത്?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) വൈദ്യുത ഉപഭോഗത്തിന്റെ ശരാശരി കണ്ട്

b) ഓരോ മാസത്തെയും വൈദ്യുതി ഉപഭോഗം താരതമ്യം ചെയ്ത്

- **ഉത്തരം**

a) ഫാത്തിമ b) ദേവിക c) രണ്ട് പോരും d) ആരും തന്നെയില്ല

38) അച്ഛൻ ആനിക്കും ആൽബിക്കും ഒരു പോലെയുള്ള രണ്ട് കേക്ക് കൊണ്ടുവന്നു. അന്ന് തന്നെ അമ്മ അവയിൽ ഒന്ന് നാലു തുല്യഭാഗങ്ങളാക്കി വീതിച്ച് അവർക്ക് നൽകി. അപ്പോൾ ആനിക്കും ആൽബിക്കും $\frac{1}{4}$ ഭാഗം വീതം കിട്ടി. പിറ്റേന്ന് കേക്ക് മുറിക്കുമ്പോൾ ആൽബി രണ്ട് കഷ്ണം ആവശ്യപ്പെട്ടു. അമ്മ കേക്കിനെ 8 തുല്യഭാഗങ്ങളാക്കി മുറിച്ച് അതിൽ നിന്നും രണ്ട് ഭാഗം നൽകി. ആൽബിക്ക് കൂടുതൽ അളവ് കേക്ക് കിട്ടിയത് ഏത് ദിവസം?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) $\frac{1}{4}, \frac{2}{8}$ ഇവ താരതമ്യം ചെയ്ത്

b) $\frac{4}{1}, \frac{8}{2}$ ഇവ താരതമ്യം ചെയ്ത്

c) 1,2 ഇവ താരതമ്യം ചെയ്ത്

- **ഉത്തരം**

a) ആദ്യ ദിവസം b) രണ്ടാമത്തെ ദിവസം

c) രണ്ട് ദിവസവും കിട്ടിയത് തുല്യം d) ഇവയൊന്നും അല്ല

39) അർദ്ധവാർഷിക പരീക്ഷയിൽ 6-ാം ക്ലാസ് എ ഡിവിഷനിലെ 45 കുട്ടികളിൽ 46% പേർക്ക് എല്ലാവിഷയത്തിലും എ ഗ്രേഡ് ലഭിച്ചു. ബി ഡിവിഷനിലെ 50 കുട്ടികളിൽ 40% പേർക്കും എ ഗ്രേഡ് ലഭിച്ചു. എങ്കിൽ കൂടുതൽ എ ഗ്രേഡ് ലഭിച്ചിട്ടുണ്ടാകുക ഏത് ഡിവിഷനിലാണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) 45, 50 ഇവയിൽ വലുതേതെന്ന് കണ്ട്

b) 45ന്റെ 46%, 50ന്റെ 40% എന്നിവ കണ്ടെത്തി താരതമ്യം ചെയ്ത്

- **ഉത്തരം**

a) A b) B c) രണ്ട് ഡിവിഷനും d) ഇതൊന്നുമല്ല

40) ജോൺസൺ $2\frac{2}{5}$ കപ്പ് ഓറഞ്ച് ജ്യൂസും $2\frac{1}{5}$ കപ്പ് ലൈമും $2\frac{2}{5}$ കപ്പ് പൈനാപ്പിൾ ജ്യൂസും ചേർത്ത് മിക്സഡ് ജ്യൂസ് ഉണ്ടാക്കി. എങ്കിൽ ആകെ എത്ര കപ്പ് മിക്സഡ് ജ്യൂസ് ഉണ്ടാക്കിയിട്ടുണ്ടാകും.

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) ആകെ അളവുകൾ കൂട്ടിയിട്ട്

b) ആകെ അളവുകൾ ഗുണിച്ച്

- **ഉത്തരം**

a) 6 കപ്പ് b) 8 കപ്പ് c) 7 കപ്പ് d) 5 കപ്പ്

APPENDIX II

(Final)

MATHEMATICS PROBLEM SOLVING ABILITY TEST (2017)

Std. VII Time : 2 Hours

Dr. K. Vijayakumari	Jidhina.K
Associate Professor	M.Ed Student
Farook Training College	Faoork Training College

Personal Data Sheet

Name of the student: Name of the school:

Medium : Gender : M / F

Religion : H /M / C Birth order : First/Middle/Later

Occupation of father: Occupation of mother:

Qualification of father: Qualification of mother:

നിർദ്ദേശങ്ങൾ

നിത്യജീവിതവുമായി ബന്ധപ്പെട്ട ചില സന്ദർഭങ്ങളാണ് ചുവടെ ചോദ്യരൂപത്തിൽ നൽകിയിരിക്കുന്നത്. താഴെ നൽകിയിരിക്കുന്ന ഉദാഹണത്തെ അടിസ്ഥാനമാക്കി ചോദ്യങ്ങളുടെ ഉത്തരങ്ങൾക്ക് നേരെ ശരി (✓) അടയാളം രേഖപ്പെടുത്തുക. ആവശ്യമായവ പൂരിപ്പിക്കുകയും വേണം.

ഉദാഹരണം :

കായിക മത്സരത്തോട് അനുബന്ധിച്ച് നടന്ന ചാട്ടമത്സരത്തിൽ 13 വയസ്സുകാരൻ അമൽ 3.05 മീറ്ററും 12വയസ്സുകാരൻ ശ്യാമിൽ 3.50മീറ്ററും ചാടി. എങ്കിൽ ആരാണ് മത്സരത്തിൽ വിജയിച്ചത്.

- കണ്ടെത്തേണ്ട കാര്യം
  ആരാണ് കൂടുതൽ ദൂരം ചാടിയത്_____

- ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം
  b) കുട്ടികളുടെ വയസ്സ്
  ✓b) 3.05, 3.50 എന്നിവയിൽ വലുത് ഏതെന്ന അറിവ്
  c) മത്സര ഇനം

- ഉത്തരം
  a) അമൽ ✓ b) ശ്യാമിൽ c) രണ്ട് പേരും d) ആരും അല്ല

1) അപർണക്ക് ഒരു കുർത്ത തൈക്കുന്നതിന് $2\frac{1}{2}$ മീറ്റർ തുണി ആവശ്യമുണ്ട് ഇത്തരത്തിൽ 5 എണ്ണം തൈക്കുവാൻ എത്ര മീറ്റർ തുണി അപർണ വാങ്ങണം?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) കുർത്ത തൈക്കുന്നതിന് ആവശ്യമായ തുണിയുടെ അളവിനെ 5 കൊണ്ട് ഗുണിച്ച്
b) കുർത്ത തൈക്കുന്നതിന് ആവശ്യമായ തുണിയുടെ അളവിനെ 5 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

a) $12\frac{1}{2}$ മീറ്റർ b) $12\frac{2}{1}$ മീറ്റർ c) 10 മീറ്റർ d) ഇവയൊന്നും അല്ല

2) ഒരു മണിക്ക് ക്ലോക്കിലെ മണിക്കൂർ സൂചിയും മിനിറ്റ് സൂചിയും തമ്മിൽ ഉണ്ടാക്കുന്ന കോൺ 30^0 ആണ്. എങ്കിൽ 3 മണിക്ക് സൂചികൾ തമ്മിലുള്ള കോൺ എത്ര ഡിഗ്രി ആയിരിക്കും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) കോൺമാപിനി ഉപയോഗിച്ച് കോണളവ് കണ്ടെത്തുന്നു.

b) ക്ലോക്കിലെ മണിക്കൂർ സൂചിയും മിനിറ്റ് സൂചിയും നിൽക്കുന്ന സംഖ്യകൾക്കിടയിലെ കോണളവ് തന്നിരിക്കുന്ന കോണളവുമായി ബന്ധപ്പെടുത്തി കണക്കാക്കുന്നു.

- **ഉത്തരം**

b) 30^0 b) 45^o c) 90^o d) 135^o

3) മധുവും മുർഷിദും സ്കൂളിലെ കുട്ടികൾക്കായുള്ള പാൽവിതരണത്തിൽ അധ്യാപകനെ സഹായിക്കാറുണ്ട്. അത്തരത്തിൽ ഒരു ദിവസം വിതരണത്തിനുശേഷം 2 ലിറ്റർ പാൽ ബാക്കിയായി. അധ്യാപകൻ രണ്ട്പേർക്കും അത് തുല്യമായി വീതിച്ചു നൽകി. എങ്കിൽ ഓരോരുത്തർക്കും എത്ര ലിറ്റർ പാൽ വീതം ലഭിക്കും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ബാക്കിയായ പാലിന്റെ അളവിനെ കുട്ടികളുടെ എണ്ണം കൊണ്ട് ഗുണിച്ച്.

  b) ബാക്കിയായ പാലിന്റെ അളവിനെ കുട്ടികളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  b) 1 ലിറ്റർ b) 2 ലിറ്റർ c) $\frac{1}{2}$ ലിറ്റർ d) $\frac{3}{4}$ ലിറ്റർ

4) റഹീമിന്റെ വീട്ടിൽ നിന്നും 8.5 കിലോമീറ്റർ ദൂരമുണ്ട് അവൻ പഠിക്കുന്ന സ്കൂളിലേക്ക് എന്നും ആദ്യത്തെ കുറച്ച് ദൂരം സൈക്കിളിലും പിന്നീട് 5.4 കിലോമീറ്റർ ബസ്സിലുമാണ് അവൻ യാത്ര ചെയ്യാറുള്ളത്. എങ്കിൽ എത്ര കിലോമീറ്ററാണ് റഹീം സൈക്കിളിൽ സഞ്ചരിക്കുന്നത്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ സഞ്ചരിച്ച ദൂരവും ബസിൽ സഞ്ചരിച്ച ദൂരവും പരിഗണിച്ച്

  b) ആകെ സഞ്ചരിച്ച ദൂരം മാത്രം പരിഗണിച്ച്

- **ഉത്തരം**

  a) 13.9 കിലോമീറ്റർ b) 3 കിലോമീറ്റർ c) 31 കിലോമീറ്റർ d) 3.1 കിലോമീറ്റർ

5) അസ്മ, അഥീന എന്നിവർ അയൽക്കാരാണ്. കൂടാതെ ഓരോ അയൽക്കൂട്ടത്തിലെ അംഗങ്ങളും ഇടയ്ക്കിടയ്ക്ക് ഇവർ അയൽക്കൂട്ടത്തിൽ നിന്നും പണം കടം വാങ്ങാ റുണ്ട്. ഒരിക്കൽ കടം വാങ്ങിയ തുകയിൽ അസ്മ 5000 രൂപയും അഥീന, അസ്മ നൽകാനുള്ള തുകയുടെ 3 മടങ്ങും തിരിച്ച് കൊടുക്കണം. എങ്കിൽ എത്ര രൂപ അഥീന തിരിച്ച് നൽകണം?

കണ്ടെത്തേണ്ട കാര്യം

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) അസ്മ നൽകാനുള്ള തുകയോട് 3 കൂട്ടിയത്

  b) അസ്മ നൽകാനുള്ള തുകയെ 3 കൊണ്ട് ഗുണിച്ച്

  c) അസ്മ നൽകാനുള്ള തുകയെ 3 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) Rs.1,667 b) Rs.1,845 c) Rs.5,003 d) Rs.15,000

6) സ്കൂൾ കലോൽസവത്തിന്റെ ഭാഗമായി പ്രധാനവേദിയിൽ കുട്ടികൾക്കായി ഇരിക്കാൻ 100 ബഞ്ചുകളും 50 കസേരകളും ഉണ്ട്. ഓരോ ബഞ്ചിലും 4 കുട്ടികൾ വീതം ഇരിക്കു ന്നു. ബാക്കി ഉള്ളവർ കസേരകളിലും കൂടാതെ സ്ഥലം ലഭ്യമല്ലാത്തതിനാൽ 20 പേർ നിന്നു പരിപാടി വീക്ഷിക്കുന്നു. എങ്കിൽ പ്രധാനവേദിയിൽ ആകെ എത്ര കുട്ടികൾക്ക് പരിപാടി വീക്ഷിക്കാനാവും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**
  a) $(100 \times 4) + 50 + 20$
  b) $100 \times (4 + 50) + 20$

- **ഉത്തരം**

  b) 7400 b) 470 c) 5420 d) ഇവയൊന്നും അല്ല

7) റേഷൻ കടയിൽ നിന്ന് 4 കിലോഗ്രാം വീതം ലഭിക്കുന്ന ഗോതമ്പ് വാങ്ങാൻ 8 വീട്ടുകാർ ഒന്നിച്ച് എത്തി. കടയിൽ 30 കിലോഗ്രാം ഗോതമ്പ് മാത്രമേ അപ്പോൾ ഉണ്ടായിരുന്നുള്ളു. അത് തുല്യമായി വീതിച്ച് ഓരോരുത്തർക്കും കടക്കാരൻ നൽകി. എങ്കിൽ ഓരോ വീട്ടുകാർക്കും എത്ര കിലോഗ്രാം ഗോതമ്പ് കിട്ടും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെയുള്ള ഗോതമ്പിന്റെ അളവിനെ വീട്ടുകാരുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

  b) ആകെയുള്ള ഗോതമ്പിന്റെ അളവിനെ ഓരോരുത്തർക്കും ലഭിക്കുന്ന വിഹിതം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**
  b) $3\frac{6}{4}$ b) $3\frac{3}{4}$ c) $3\frac{4}{3}$ d) $3\frac{8}{6}$

8) ഒരു സ്കൂളിലെ 5-B യിൽ നിന്ന് 14 പേരും മറ്റു ക്ലാസ്സുകളിൽ നിന്നായി 216 പേരും ഉച്ചഭക്ഷണം കഴിക്കുന്നുണ്ട്. ഗവൺമെന്റ് ഒരു കുട്ടിക്ക് 150 ഗ്രാം അരിയാണ് നൽകുന്നത്. എങ്കിൽ ഒരു ദിവസം ആകെ എത്ര കിലോഗ്രാം അരി സ്കൂളിന് ആവശ്യമുണ്ട്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) സ്കൂളിൽ നിന്ന് ഉച്ചഭക്ഷണം കഴിക്കുന്ന കുട്ടികളുടെ ആകെ എണ്ണത്തെ 150 കൊണ്ട് ഹരിച്ച്

  b) സ്കൂളിൽ നിന്ന് ഉച്ചഭക്ഷണം കഴിക്കുന്ന കുട്ടികളുടെ ആകെ എണ്ണത്തെ 150 കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  b) 34.5 കി.ഗ്രാം. b) 3.45 കി.ഗ്രാം c) 345 കി.ഗ്രാം d) ഇവയൊന്നും അല്ല

9) നോട്ട് പുസ്തകത്തിന്റെ ഒരു പേജിനെ കോണോടു കോൺ മുറിച്ച് 2 കഷ്ണങ്ങൾ ആക്കിയാൽ കിട്ടുന്ന ഓരോ ഭാഗത്തിന്റെയും ആകൃതി എന്താണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) നോട്ട് പുസ്തകത്തിലെ പേജിന്റെ ആകൃതി ചതുരമാണ് എന്നത് പരിഗണിച്ച്.

  b) പേജിന്റെ ആകൃതി സമചതുരമാണ് എന്നത് പരിഗണിച്ച്.

- **ഉത്തരം**

  a) ചതുരം b) സമചതുരം c) ത്രികോണം d) ഇവയൊന്നും അല്ല

10) സ്കൂൾ തുറക്കുന്നതിനോടനുബന്ധിച്ച് അമ്മ ബെറ്റ്സി, ബെനില, ബെനിറ്റ എന്നിവർ ക്കായി 6 മീറ്റർ റിബ്ബൺ വാങ്ങി. എന്നിട്ട് അതിനെ $\frac{3}{4}$ മീറ്റർ നീളമുള്ള കഷണങ്ങൾ ആക്കി തുല്യമായി വീതിച്ച് എടുക്കാൻ ആവശ്യപ്പെട്ടു. എങ്കിൽ $\frac{3}{4}$ മീറ്റർ നീളമുള്ള എത്ര കഷ്ണങ്ങൾ ഉണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ വാങ്ങിയ റിബ്ബണിന്റെ നീളത്തെ $\frac{3}{4}$ കൊണ്ട് ഗുണിച്ച്.

  b) ആകെ വാങ്ങിയ റിബ്ബണിന്റെ നീളത്തെ $\frac{3}{4}$ കൊണ്ട് ഹരിച്ച്.

- **ഉത്തരം**

  a) 9 b) 7 c) 10 d) 8

11) പഞ്ചായത്തിലെ 7-ാം വാർഡിൽ ആകെ 2000 വോട്ടർമാരുണ്ട്. അതിൽ കഴിഞ്ഞ നിയമസഭ തിരഞ്ഞെടുപ്പിന് 65% പേർ വോട്ട് രേഖപ്പെടുത്തി. എങ്കിൽ എത്ര ആളുകൾ അന്നേദിവസം വോട്ട് ചെയ്തു?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ വോട്ടർമാരുടെ $\frac{65}{100}$ ഭാഗം എത്രയെന്ന് കണ്ട്

  b) ആകെ വോട്ടർമാരുടെ $\frac{35}{100}$ ഭാഗം എത്രയെന്ന് കണ്ട്

- **ഉത്തരം**

  a) 1400 b) 700 c) 1200 d) 1300

12) റമീസ് തന്റെ ബന്ധു വീടുകളിലേക്ക് കൊണ്ട് പോകുന്നതിനായി $\frac{3}{4}$ കിലോഗ്രാം ഭാരമുള്ള 3 കഷ്ണം തണ്ണിമത്തൻ വാങ്ങി. റമീസിന്റെ കൈവശം ആകെ എത്ര കിലോഗ്രാം തണ്ണിമത്തൻ ഉണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  c) കഷ്ണങ്ങളുടെ എണ്ണത്തെ $\frac{3}{4}$ കിലോഗ്രാം കൊണ്ട് ഗുണിച്ച്.

  d) കഷ്ണങ്ങളുടെ എണ്ണത്തെ $\frac{3}{4}$ കിലോഗ്രാം കൊണ്ട് ഹരിച്ച്.

- **ഉത്തരം**

  a) 2 കിലോഗ്രാം b) $2\frac{3}{4}$ കിലോഗ്രാം c) $2\frac{1}{4}$ കിലോഗ്രാം d) $2\frac{1}{2}$കിലോഗ്രാം.

13) 20 ചാക്ക് സിമന്റിന്റെ തൂക്കം 1000 കിലോഗ്രാം ആണ്. എങ്കിൽ 16 ചാക്ക് സിമന്റിന്റെ തൂക്കം എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഒരു ചാക്ക് സിമന്റിന്റെ തൂക്കം കണ്ട് അതിനെ 16 കൊണ്ട് ഗുണിച്ച്

  b) 16നെ ആകെ തന്നിരിക്കുന്ന തൂക്കം കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  a) 16 കിലോ ഗ്രാം b) 800 കിലോ ഗ്രാം

  c) 16,000 കിലോ ഗ്രാം d) ഇവയൊന്നുമല്ല

14) സ്കൂളിലെ ഫുട്ബോൾ പരിശീലനത്തിന് ആകെ 110 കുട്ടികൾ പേര് നൽകി. അതിൽ നിന്നും സ്ക്രീനിങ്ങിന് ശേഷം 77 പേരെ ഒഴിവാക്കി. ബാക്കിയുള്ളവരെ 11 പേർ വീതമുള്ള ഗ്രൂപ്പുകളാക്കി തിരിച്ച് പരിശീലനം നൽകാൻ തീരുമാനിച്ചു. എങ്കിൽ ആകെ എത്ര ഗ്രൂപ്പുകൾ ഉണ്ടാവും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ പേര് നൽകിയവരുടെ എണ്ണത്തെ ഗ്രൂപ്പിലെ അംഗങ്ങളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്
  b) സ്ക്രീനിങ്ങിന് ശേഷം ഒഴിവാക്കിയവരുടെ എണ്ണത്തെ ഗ്രൂപ്പിലെ അംഗങ്ങളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്
  c) സ്ക്രീനിങ്ങിലൂടെ തിരഞ്ഞെടുത്തവരുടെ എണ്ണത്തെ ഗ്രൂപ്പ് അംഗങ്ങളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 3 b) 7 c) 11 d) 4

15) മകന്റെ വയസ്സിന്റെ മൂന്ന് മടങ്ങിനോട് രണ്ട് കൂട്ടിയാൽ അച്ഛന്റെ വയസ്സ് കിട്ടും. അച്ഛന്റെ വയസ്സ് എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**
  a) മകന്റെ വയസ്സ് x എന്ന് പരിഗണിച്ച് അച്ഛന്റെ വയസ്സ്
  b) അച്ഛന്റെ വയസ്സ് x എന്ന് പരിഗണിച്ച് അതിന്റെ 3 മടങ്ങിനോട് 2 കൂട്ടി

- **ഉത്തരം**

  a) അച്ഛന്റെ വയസ്സ് = x ÷ 3+2 b) അച്ഛന്റെ വയസ്സ് = 3x+2
  c) അച്ഛന്റെ വയസ്സ് = 3x-2 d) ഇവയൊന്നുമല്ല

16) സ്കൂൾ പ്രവേശനോത്സവത്തോട് അനുബന്ധിച്ച് തോരണം ഉണ്ടാക്കാൻ വിവിധ നിറത്തിലുള്ള 30 മീറ്റർ റിബ്ബണുകൾ വാങ്ങി. ഇതിൽ $\frac{3}{4}$ മീറ്റർ നീളത്തിൽ ചുവപ്പും $\frac{1}{2}$ മീറ്റർ നീളത്തിൽ വെള്ളയും $\frac{1}{4}$ മീറ്റർ നീളത്തിൽ പച്ച റിബ്ബണും ബാക്കിയായി. എങ്കിൽ ആകെ എത്ര മീറ്റർ റിബ്ബൺ ബാക്കി ഉണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ നീളത്തിൽ നിന്ന് $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ എന്നിവയുടെ തുക കുറച്ച്

  b) $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$, ഇവയുടെ തുക കണ്ട്

- **ഉത്തരം**

  a) $28\frac{1}{2}$ മീറ്റർ b) 1 മീറ്റർ c) 2 മീറ്റർ d) $1\frac{1}{2}$ മീറ്റർ

17) നോട്ട് പുസ്തകത്തിലെ ഒരു പേജിന്റെ 4 മൂലകളിലെയും കോണളവുകൾ എത്ര ഡിഗ്രി വീതമാണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ചതുരത്തിലെ 4 കോണുകൾ തുല്യവും മട്ടകോണും ആണെന്ന അറിവ്.

  b) ചതുരത്തിന്റെ എതിർ കോണുകൾ അനുപൂരകമാണ് എന്നറിവ്.

- **ഉത്തരം**

  a) 90^0 b) 45^0 c) 130^0 d) 50^0

18) ചതുരാകൃതിയിലുള്ള ഒരു പുരയിടത്തിന്റെ ഒരു വശത്തിന്റെ നീളം x മീറ്ററും വീതി y മീറ്ററും ആയാൽ പുരയിടത്തിന് ചുറ്റുമുള്ള വേലിയുടെ നീളം എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) നീളം x വീതി y എന്ന് പരിഗണിച്ച് പരപ്പളവ് കണ്ട്

  b) നീളം x വീതി y എന്ന് പരിഗണിച്ച് ചുറ്റളവ് കണ്ട്

- **ഉത്തരം**

  a) വേലിയുടെ നീളം = xy b) വേലിയുടെ നീളം = 2(x+y)

  c) വേലിയുടെ നീളം = 2x+y d) വേലിയുടെ നീളം = x+2y

19) ഇഷ്ടിക കൊണ്ട് ഉണ്ടാക്കിയ ഒരു ടാങ്കിന്റെ അകത്തെ നീളം 3 മീറ്ററും വീതി 1.5 മീറ്ററും ആണ്. ടാങ്കിന് 1.6 മീറ്റർ ഉയരം ഉണ്ട്. എങ്കിൽ ടാങ്കിൽ എത്ര വെള്ളം കൊള്ളും?

കണ്ടെത്തേണ്ട കാര്യം

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ടാങ്കിന്റെ പരപ്പളവ് കണ്ട്

  b) ടാങ്കിന്റെ ഉള്ളളവ് കണ്ട്

  c) ടാങ്കിന്റെ ചുറ്റളവ് കണ്ട്

- **ഉത്തരം**

  a) 720 b) 7.2 c) 0.72 d) 72

20) ബാലുവിന് അടക്ക കച്ചവടമാണ്. ഇത്തവണ കിലോഗ്രാമിന് 145.50രൂപ പ്രകാരം 5.2 കിലോഗ്രാം അടക്ക ബാലു വിറ്റു. എങ്കിൽ അടക്കവിറ്റ ഇനത്തിൽ എത്ര രൂപ ബാലുവിന് കിട്ടും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഒരു കിലോഗ്രാം അടക്കയുടെ വിലയെ 5.2 കൊണ്ട് ഗുണിച്ച്

  b) ഒരു കിലോഗ്രാം അടക്കയുടെ വിലയെ 5.2 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  b) Rs.279.8 b) Rs.7566 c) Rs.756.6 d) Rs.2798

21) 10 രൂപ ബസ്സ് ചാർജ് നൽകുന്നതിനു പകരം നിഖില 100 രൂപയുടെ നോട്ടാണ് നൽകി യത്. അതിൽ 10 രൂപ ചാർജ് ഇനത്തിൽ എടുത്ത ശേഷം ബാക്കി 50 രൂപയുടെ ഒരു നോട്ടും 10 രൂപയുടെ നോട്ടുകളും കണ്ടക്ടർ തിരിച്ച് നൽകി. എങ്കിൽ അതിൽ എത്ര 10 രൂപ നോട്ടുകൾ ഉണ്ടായിരിക്കും.

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) നൂറ് രൂപയിൽനിന്ന് 50 രൂപ കുറച്ച് കിട്ടുന്ന സംഖ്യയെ 10 കൊണ്ട് ഹരിച്ച്

  b) നൂറ് രൂപയിൽ നിന്ന് 50 രൂപയും ബസ്സ് ചാർജും കുറച്ച് കിട്ടുന്ന സംഖ്യയെ 10 കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  b) 5 b) 6 c) 4 d) 3

22) തീവണ്ടി രാത്രി 8.40ന് കോഴിക്കോട് സ്റ്റേഷനിൽ നിന്ന് പുറപ്പെട്ട് 9.45ന് തിരൂരിൽ എത്തുന്നു. എങ്കിൽ തീവണ്ടി കോഴിക്കോട് നിന്ന് തിരൂരെത്താൻ ആകെ എത്ര സമയം എടുത്തു?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) തീവണ്ടിയുടെ വേഗത നോക്കി.

  b) തീവണ്ടി എത്തിച്ചേർന്ന സമയത്ത് നിന്നും തീവണ്ടി പുറപ്പെട്ട സമയം കുറച്ച്

  c) തീവണ്ടി പുറപ്പെട്ടതും എത്തിച്ചേർന്നതും ആയ സമയങ്ങൾ കൂട്ടി.

- **ഉത്തരം**

  a) 1.05 b) 17.85 c) 1.45 d) 17.00

23) മെഹറിൻ ആകെ ശമ്പളത്തിന്റെ $\frac{3}{10}$ ഭാഗം ആഹാരത്തിനും $\frac{1}{5}$ ഭാഗം കുട്ടികളുടെ വിദ്യാഭ്യാസത്തിനും $\frac{1}{10}$ ഭാഗം നിക്ഷേപമായും ചെലവാക്കുന്നു. എങ്കിൽ മറ്റാവശ്യങ്ങൾ ക്ക് ചെലവാക്കുന്നത് ശമ്പളത്തിന്റെ എത്രഭാഗമാണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) $\frac{1}{10}, \frac{1}{5}, \frac{3}{10}$ എന്നിവയുടെ തുക കണ്ട് അത് $\frac{10}{10}$ ൽ നിന്ന് കുറച്ച്.

  b) $\frac{1}{10}, \frac{1}{5}, \frac{3}{10}$ എന്നിവയുടെ തുക

- **ഉത്തരം**

  a) $\frac{6}{10}$ b) $\frac{5}{10}$ c) $\frac{3}{10}$ d) $\frac{4}{10}$

24) ഒരു ലിറ്റർ പെട്രോളിന് 67.50 രൂപയാണ്. വിനുവിന്റെ അച്ഛൻ 270 രൂപയ്ക്ക് പെട്രോൾ അടിച്ചു. എങ്കിൽ എത്ര ലിറ്റർ പെട്രോളാകും അദ്ദേഹം തന്റെ ബൈക്കിന് അടിച്ചിട്ടു ണ്ടാകുക?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ഒരു ലിറ്റർ പെട്രോളിന്റെ വിലയെ 270 കൊണ്ട് ഹരിച്ച്

  b) ഒരു ലിറ്റർ പ്രെട്രോളിന്റെ വിലയെ 270 കൊണ്ട് ഗുണിച്ച്

  c) 270 നെ ഒരു ലിറ്റർ പ്രെട്രോളിന്റെ വില കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 4.5 ലിറ്റർ b) 5.0 ലിറ്റർ c) 4.0 ലിറ്റർ d) 5.5 ലിറ്റർ

25) ജി.എച്ച്.എസ്.എസിൽ 3127 കുട്ടികൾ പഠിക്കുന്നുണ്ട്. ഇതിൽ എട്ടാം ക്ലാസ്സിലെ 657 കുട്ടികൾ സ്കൂളിൽ നിന്നും വിനോദയാത്രക്ക് പോകുന്നു. യാത്രാ ചിലവിലേക്ക് യാത്ര പോകുന്ന ഓരോ കുട്ടിയിൽ നിന്നും 200 രൂപ വീതം വാങ്ങിയാൽ വിനോദയാത്രക്കായി ആകെ എത്ര രൂപ സ്കൂൾ സമാഹരിച്ചിട്ടുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) സ്കൂളിലെ ആകെ കുട്ടികളുടെ എണ്ണത്തെ ഒരു കുട്ടിക്ക് ചിലവാകുന്ന തുക കൊണ്ട് ഗുണിച്ച്

  b) വിനോദയാത്രക്ക് പോകുന്ന കുട്ടികളുടെ എണ്ണത്തെ ഒരാൾക്ക് ചിലവാകുന്ന തുക കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  a) Rs.131400 b) Rs.6254 c) Rs.1314 d) Rs.625400

26) മാധവ് കടയിൽ നിന്നു വിവിധ നിറത്തിലുള്ള 13 പേനകൾ വാങ്ങി പേനയുടെ വിലയായി ആകെ 32.50 രൂപ നൽകി. എങ്കിൽ ഒരു പേനയുടെ വില എത്ര?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) പേനയുടെ വിലയെ പേനയുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്

  b) പേനയുടെ എണ്ണത്തെ വിലകൊണ്ട് ഹരിച്ച്

  c) പേനയുടെ വിലയെ എണ്ണം കൊണ്ട് ഗുണിച്ച്

- **ഉത്തരം**

  a) Rs.3.5 b) Rs.2 c) Rs.3 d) Rs.2.5

27) 7-ാം ക്ലാസിലെ 2 ഡിവിഷനുകളിലായി നടത്തിയ ഇംഗ്ലീഷ് പരീക്ഷയിൽ എ ഡിവിഷനിൽ 45ൽ 42 പേരും, ബി ഡിവിഷനിൽ 48ൽ 44 പേരും വിജയിച്ചു. ഏത് ഡിവിഷനിലാണ് മികച്ച വിജയം ലഭിച്ചിരിക്കുന്നത്.

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) 42, 44 ഇവയിൽ വലുത് കണ്ടെത്തി

  b) $\frac{42}{45}, \frac{44}{48}$ ഇവയിൽ വലുത് കണ്ടെത്തി

  c) $\frac{45}{42}, \frac{48}{44}$ ഇവിയിൽ വലുത് കണ്ടെത്തി

- **ഉത്തരം**

  a) B b) A c) രണ്ട് ഡിവിഷനിലും ഒരു പോലെ d) ഇതൊന്നുമല്ല

28) അടുക്കളത്തോട്ടത്തിൽ പാവലിന് പന്തൽ ഇടുന്നതിനായി വൈഷ്ണവ് 13.5 മീറ്റർ കയർ വാങ്ങി. ഇതിനെ 1.5 മീറ്റർ നീളത്തിൽ മുറിച്ച് കഷ്ണങ്ങളാക്കിയാണ് പന്തൽ ഒരുക്കിയത്. എങ്കിൽ 1.5 മീറ്റർ നീളത്തിലുള്ള എത്ര കഷ്ണം കയർ ലഭിക്കും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) ആകെ വാങ്ങിയ കയറിന്റെ നീളത്തെ 1.5 കൊണ്ട് ഹരിച്ച്

  b) ഒരു കഷ്ണത്തിന്റെ നീളത്തെ ആകെ കയറിന്റെ നീളം കൊണ്ട് ഹരിച്ച്

- **ഉത്തരം**

  a) 6 മീറ്റർ b) 7 മീറ്റർ c) 8 മീറ്റർ d) 9 മീറ്റർ

29) റിപ്പബ്ലിക് ദിനത്തോടനുബന്ധിച്ച് സ്കൂളിൽ നൽകുന്നതിനായി 2000 മിഠായികൾ വാങ്ങി അവയെ 40 എണ്ണം വീതമുള്ള വിവിധ പാക്കറ്റുകളാക്കിയാണ് ക്ലാസുകളിലേക്ക് വിതരണം ചെയ്തത്. എങ്കിൽ അത്തരം എത്ര പാക്കറ്റുകൾ ഉണ്ടാകാം?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  a) മിഠായികളുടെ എണ്ണത്തെ 40 കൊണ്ട് ഗുണിച്ച്

  b) ആകെ മിഠായികുളടെ എണ്ണത്തെ ഒരു പാക്കറ്റിലെ മിഠായികളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്.

  c) ഒരു പാക്കറ്റിലെ മിഠായികളുടെ എണ്ണത്തെ ആകെ മിഠായികളുടെ എണ്ണം കൊണ്ട് ഹരിച്ച്.

- **ഉത്തരം**

  a) 500 b) 1000 c) 50 d) 80000

30) പാർവ്വതി കിലോഗ്രാമിന് 32.50 പ്രകാരം 6 കി.ഗ്രാം അരിയും 28.50 പ്രകാരം 2 കി.ഗ്രാം പഞ്ചസാരയും വാങ്ങി. എങ്കിൽ ആകെ എത്ര രൂപ സാധനങ്ങൾക്കായി പാർവ്വതി ചിലവാക്കിയിട്ടുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

  b) 1 കി.ഗ്രാം. പഞ്ചസാരയുടെയും അരിയുടെയും വിലകൾ കൂട്ടി

  b) ആറ് കൊണ്ട് ഒരു കി.ഗ്രാം അരിയുടെ വില ഗുണിച്ച് അതിനെ 2 കൊണ്ട് ഗുണിച്ച ഒരു കി.ഗ്രാം പഞ്ചസാരയുടെ വില കൂട്ടി

- **ഉത്തരം**

  a) Rs.248 b) Rs.61 c) Rs.252 d) Rs.65

31) മനു തന്റെ സേവിംഗ്സ് ബോക്സ് (ഹുണ്ടിക) പൊട്ടിച്ചപ്പോൾ അതിൽ 50 പൈസയുടെ 30 നാണയങ്ങളും 1 രൂപയുടെ 40 നാണയങ്ങളും 2 രൂപയുടെ 15 നാണയങ്ങളും 5 രൂപയുടെ 14 നാണയങ്ങളും 10 രൂപയുടെ 5 നാണയങ്ങളും ഉണ്ടായിരുന്നു. എങ്കിൽ ആകെ എത്ര രൂപ മനുവിന്റെ പക്കലുണ്ടാകും?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) നാണയങ്ങളുടെ എണ്ണത്തെ അതിന്റെ മൂല്യം കൊണ്ട് ഗുണിച്ച് തുക കാണൽ

b) നാണയങ്ങളുടെ ആകെ മൂല്യം കണ്ട്

c) നാണയങ്ങളുടെ എണ്ണം കൂട്ടി.

- **ഉത്തരം**

a) Rs.205 b) Rs.230 c) Rs.104 d) Rs.220

32) 6-ാം ക്ലാസ് വിദ്യാർത്ഥികളായ മായ, മാസി, ഗാദ എന്നിവരുടെ ഉയരം ചുവടെ കൊടുക്കുന്നു. 140.01 സെന്റീമീറ്റർ, 140.40 സെന്റീമീറ്റർ, 140.05 സെന്റീമീറ്റർ ഉയര ക്രമത്തിൽ ഇവർ അസംബ്ലിക്ക് നിൽക്കുകയാണെങ്കിൽ എങ്ങനെയാകും നിൽക്കുക?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) ദശാംശ സംഖ്യകളെ അവരോഹണക്രമത്തിലെഴുതി

b) ദശാംശ സംഖ്യകളെ ആരോഹണക്രമത്തിലെഴുതി

- **ഉത്തരം**

a) മായ, ഗാദ, മാസി b) ഗാദ, മാസി, മായ
c) മാസി, മായ, ഗാദ d) മായ, മാസി, ഗാദ

33) ദേവികയുടെയും ഫാത്തിമയുടെയും വീടുകളിലെ കഴിഞ്ഞ 4 മാസത്തെ വൈദ്യുതി ഉപയോഗം (യൂണിറ്റിൽ) ചുവടെ കൊടുക്കുന്നു.

മാസം / വ്യക്തി	ഏപ്രിൽ	മെയ്	ജൂൺ	ജൂലായ്
ദേവിക	85	77	80	78
ഫാത്തിമ	78	89	70	80

ഇവരിൽ ആരുടെ കുടുംബമാണ് മറ്റുള്ളവർക്ക് മാതൃകയാകും വിധം ശരാശരി വൈദ്യുതി ഉപയോഗം നിയന്ത്രിക്കുന്നത്?

- **കണ്ടെത്തേണ്ട കാര്യം**

.....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) വൈദ്യുത ഉപഭോഗത്തിന്റെ ശരാശരി കണ്ട്

b) ഓരോ മാസത്തെയും വൈദ്യുതി ഉപഭോഗം താരതമ്യം ചെയ്ത്

- **ഉത്തരം**

a) ഫാത്തിമ b) ദേവിക c) രണ്ട് പോരും d) ആരും തന്നെയില്ല

34) അർദ്ധവാർഷിക പരീക്ഷയിൽ 6-ാം ക്ലാസ് എ ഡിവിഷനിലെ 45 കുട്ടികളിൽ 46% പേർക്ക് എല്ലാവിഷയത്തിലും എ ഗ്രേഡ് ലഭിച്ചു. ബി ഡിവിഷനിലെ 50 കുട്ടികളിൽ 40% പേർക്കും എ ഗ്രേഡ് ലഭിച്ചു. എങ്കിൽ കൂടുതൽ എ ഗ്രേഡ് ലഭിച്ചിട്ടുണ്ടാകുക ഏത് ഡിവിഷനിലാണ്?

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) 45, 50 ഇവയിൽ വലുതേതെന്ന് കണ്ട്

b) 45ന്റെ 46%, 50ന്റെ 40% എന്നിവ കണ്ടെത്തി താരതമ്യം ചെയ്ത്

- **ഉത്തരം**

a) A b) B c) രണ്ട് ഡിവിഷനും d) ഇതൊന്നുമല്ല

35) ജോൺസൺ $2\frac{2}{5}$ കപ്പ് ഓറഞ്ച് ജ്യൂസും $2\frac{1}{5}$ കപ്പ് ലൈമും $2\frac{2}{5}$ കപ്പ് പൈനാപ്പിൾ ജ്യൂസും ചേർത്ത് മിക്സഡ് ജ്യൂസ് ഉണ്ടാക്കി. എങ്കിൽ ആകെ എത്ര കപ്പ് മിക്സഡ് ജ്യൂസ് ഉണ്ടാക്കിയിട്ടുണ്ടാകും.

- **കണ്ടെത്തേണ്ട കാര്യം**

  .....

- **ഉത്തരത്തിലെത്താൻ ആവശ്യമായ വിവരം**

a) ആകെ അളവുകൾ കൂട്ടിയിട്ട്

b) ആകെ അളവുകൾ ഗുണിച്ച്

- **ഉത്തരം**

a) 6 കപ്പ് b) 8 കപ്പ് c) 7 കപ്പ് d) 5 കപ്പ്

APPENDIX III

(Final)

MATHEMATICS PROBLEM SOLVING ABILITY TEST (2017)

Std. VII Time: 2 hours

Dr. K. Vijayakumari
Associate professor
Farook Training College

Jidhina K
M.Ed student
Farook Training College

Personal Data Sheet

Name of the student: Name of the school:

Medium : Gender : M/F

Religion : H / M / C Birth order : First/Middle/ Later

Occupation of father: Occupation of mother:

Qualification of father: Qualification of mother:

Instructions

Some questions related to the daily life situations are given below. Based on the given example mark the answer by encircling the relevant option and fill up the necessary.

Example:

A long jump competition was conducted as part of school sports day. In that Amal 13 years, jumped 3.05m and Shyamil 12 years, jumped 3.50m. Then find out who is the winner?

- What is to be found out
  The person who covered maximum distance _____
- Essential information to solve the problem
  a) Age of children
  (b) Knowledge about the greatest number among 3.05 and 3.50
  c) Competition item
- Answer
  a) Amal (b) Shyamil c) Both d) None of these

1) Aparna requires $2\frac{1}{2}$ m cloth to stitch a Kurtha. Then how many metres of cloth she needs for stitching 5 Kuthas?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Multiply the required length of cloth by 5
  b) Divide the required length of cloth by 5
- Answer
  a) $12\frac{1}{2}$ m b) $12\frac{2}{1}$ m c) 10 m d) None of these

2) The hour and minute hands of a clock make the angle between them at 1'o clock is 30°. Then what will be the measure of angle at 3'o clock between the hands?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Measure the angle by using protractor
  b) Measure the angle between the hands to be connected with the given angle
- Answer
  a) 30° b) 45° c) 90° d) 135°

3) Madhu and Murshid help their teacher for distributing milk to students. One day after the distribution 2 litres of milk remained in the pot. Teacher divided it and gave them equally. Then how much litres of milk each person will get?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Multiply the measure of remaining milk by 2
  b) Divide the measure of remaining milk by 2

- Answer

  a) 1 litre b) 2 litre c) $\frac{1}{2}$ litre d) $\frac{3}{4}$ litre

4) Rahim's house is 8.5km far from his school. Daily he travels a certain distance by bicycle and then 5.4 km by bus to reach the school. Find the distance Rahim travels in bicycle?

- What is to be found out

  .....

- Essential information to solve the problem
  a) By considering the total distance and the distance travelled by bus.
  b) By considering the total distance only

- Answer

  a) 13.9km b) 3km c) 31km d) 3.1km

5) Asma and Atheena are neighbours and they are the members of the same ayalkootam. sometimes they borrow money from the ayalkootam. If Asma has to refund rupees 5000 and Atheena, three times that of Asma, find the amount to be refund by Atheena?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Add 3 to the amount that Asma has to paid
  b) Multiply the amount that Asma needs to pay by 3
  c) Divide the amount that Asma needs to pay by 3
- Answer

  a) Rs.1667 b) Rs.1845 c) Rs.5003 d) Rs.15000

6) 100 benches and 50 chairs are arranged in the main stage for children to view the school youth festival. 4 students can sit in each bench. Chairs and benches are fully occupied. 20 students were standing and watching the programme. Find out the total number of students viewing the programme?

- What is to be found out

  .....

- Essential information to solve the problem
  a) $(100 \times 4) + 50 + 20$
  b) $100 \times (4 + 50) + 20$

- Answer
  a) 7400 b) 470 c) 5420 d) None of these

7) Monthly a family can get 4kg of wheat from the ration shop. One day 8 persons reached for buying the wheat. But the shop had only 30 kg of wheat. The shopkeeper divided that into equal parts and gives them. How many kilograms of wheat will get for each family?

- What is to be found out
  .....

- Essential information to solve the problem
  a) Divide the total kilogram of wheat by the number of persons
  b) Divide the total kilogram of wheat by each families monthly share

- Answer
  a) $3\frac{6}{4}$ b) $3\frac{3}{4}$ c) $3\frac{4}{3}$ d) $3\frac{8}{6}$

8) 14 students from V standard B and 216 students from other classes are having meals from the school. Government is providing 150 g of rice for a child. Then for one day how many kilograms of rice is required for the school?

- What is to be found out
  .....

- Essential information to solve the problem
  a) Divide the total number of students having meals from the school by 150.
  b) Multiply the total number of students having meals from the school by 150.

- Answer
  a) 34.5kg b) 3.45kg c) 345kg d) None of these

9) A page of a note book is cut into two pieces through its opposite vertices. Then what is the shape of each piece?

- What is to be found out
  .....
- Essential information to solve the problem
  a) By considering the rectangular shape of a page
  b) By considering the square shape of a page
- Answer
  a) Rectangle b) Square c) Triangle d) None of these

10) Mother bought 6m ribbon for her daughters Betsy, Benila and Beneeta. She told them to cut the ribbon into equal pieces of length $\frac{3}{4}$ m. How many $\frac{3}{4}$ m length pieces will be got?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Multiply total length of ribbon by $\frac{3}{4}$
  b) Divide total length of ribbon by $\frac{3}{4}$
- Answer
  a) 9 b) 7 c) 10 d) 8

11) There are 2000 voters in the seventh ward of a Panchayath. Of these, 65% of voters voted in the legislative election. How many people voted that election?

- What is to be found out
  .....
- Essential information to solve the problem
  a) To find the 65% of total number of voters
  b) To find the 35% of total number of voters
- Answer
  a) 1400 b) 700 c) 1200 d) 1300

12) Ramees bought 3 pieces of watermelon which weighed $\frac{3}{4}$ kg each. What is the total weight of watermelon in Ramees hand?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Multiply number of pieces by $\frac{3}{4}$
  b) Divide the number of pieces by $\frac{3}{4}$
- Answer
  a) 2kg b) $2\frac{3}{4}$ kg c) $2\frac{1}{2}$kg d) $2\frac{1}{4}$kg

13) The weight of 20 sacks of cement is 1000kg. Then what is the weight of 16 sacks of cement?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Multiply the weight of a sack of cement by 16
  b) Multiply the given weight by 16
- Answer
  a) 16kg b) 800kg c) 16000kg d) None of these

14) 110 students gave their name for school football training programme. After the screening test, 77 were rejected. The remaining students were divided into 11members groups and provided training to them. Then find out the total number of groups?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Divide the total number of students by the number of students in each group
  b) Divide number of rejected students by the number of students in each group
  c) Divide the number of selected students by the number of members in each group
- Answer
  a) 3 b) 7 c) 11 d) 4

15) What is the age of father when his age is more than two to the 3 times of the age of his son.

- What is to be found out
  .....
- Essential information to solve the problem
  a) Considering the age of son as x
  b) Considering the age of father as x and add 2 to its 3 times
- Answer
  a) Age = x÷3+2 b) Age = 3x+2 c) Age = 3x-2 d) Age = x÷3-2

16) For decorating school on the reopening day after the summer vacation, school bought 30m ribbon of different colours. Of these, $\frac{3}{4}$m of red ribbon, $\frac{1}{2}$m white and $\frac{1}{4}$m green were left remaining. Then how many metres of ribbon remained?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Subtracting the sum of $\frac{3}{4}$, $\frac{1}{4}$ and $\frac{1}{2}$ from the total length
  b) Finding the sum of $\frac{3}{4}$, $\frac{1}{4}$ and $\frac{1}{2}$
- Answer
  a) $28\frac{1}{2}$m b)1m c) 2m d) $1\frac{1}{2}$ m

17) What is the measure of angles in each vertices of a page in a note book?

- What is to be found out
  .....
- Essential information to solve the problem
  a) For a rectangle 4 angles are equal and right angled
  b) The opposite angles of a rectangle is supplementary to each other
- Answer
  a) 90° b) 45° c) 130° d) 50°

18) A rectangular landscape has x metre length and y metre breadth. What is the total length of the wall surrounded by the landscape?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Finding the perimeter by considering the length as x and breadth as y
  b) Finding the area by considering the length as x and breadth as y
- Answer
  a) Length of the wall = xy b) Length of the wall = 2(x+y)
  c) Length of the wall = 2x+y d) Length of the wall = x+2y

19) A rectangular tank has 3m length, 1.5m breadth and 1.6m height. Find the storage capacity of the tank?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Finding the area of the tank
  b) Finding the volume of the tank
  c) Finding the surface area of the tank
- Answer
  a) 720 b) 7.2 c) 0.72 d) 72

20) Balu is an Areca nut seller. One day he sold 5.2 kg of Areca nut. Prize of 1kg Areca nut is Rs.145.50 How much rupees he earned by selling Areca nut on that day?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Multiply the prize of 1kg Areca nut by 5.2
  b) divide the prize of 1kg Areca nut by 5.2
- Answer
  a) Rs.279.8 b) Rs.7566 c) Rs.756.6 d) Rs. 2798

21) Nikhila gave 100 rupees note for10 rupees bus fare. The conductor gave the balance as one note of 50 rupees and the rest in10 rupees notes. Find the number of 10 rupees notes?

- What is to be found out
  .....

- Essential information to solve the problem
  a) Subtract 50 rupees from 100 rupees and divide that number by 10
  b) Subtract 50 rupees and bus fare from 100 rupees and divide that number by 100
- Answer
  a) 5 b) 6 c) 4 d) 3

22) A train departed from Kozhikode station at 8.40pm and arrived Tirur station at 9.45pm. Find out the time the train took to reach Tirur?

- What is to be found out
  .....

- Essential information to solve the problem
  a) Considering the speed of train
  b) Subtract the arrival time from the departure time of the train
  c) By adding the arrival and departure time of the train
- Answer
  a) 1.05 b) 17.85 c) 1.45 d) 17.00

23) From the total salary Meherin spend $\frac{3}{10}$ part for food $\frac{1}{5}$ part for children's education and $\frac{1}{10}$ part as savings. Then how much money she spends for other things?

- What is to be found out
  .....

- Essential information to solve the problem
  a) Subtract the sum of $\frac{3}{10}$, $\frac{1}{5}$ and $\frac{1}{10}$ from $\frac{10}{10}$
  b) The sum of $\frac{3}{10}$, $\frac{1}{5}$ and $\frac{1}{10}$
- Answer
  a) $\frac{6}{10}$ b) $\frac{5}{10}$ c) $\frac{3}{10}$ d) $\frac{4}{10}$

24) Cost of 1 litre petrol is rupees 67.50. Vinu's father filled petrol for rupees 270. Then how much litres of petrol he filled in his bike?

- What is to be found out
  .....
- Essential information to solve problem
  a) Divide the cost of 1 litre petrol by 270
  b) Multiply the cost of 1 litre petrol by 270
  c) Divide 270 by the cost of 1 litre petrol
- Answer
  a) 4.5litre b) 5.0litre c) 4.0 litre d) 5.5 litre

25) 3127 students are studying in G.H.S.S. Among them 657 students of eight standard are going for an excursion. For the expense of travel 200 rupees was collected from each student. Then for the excursion how much rupees the school collected?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Multiply the total number of students in school by the expense of one
  b) Multiply the number of students who are going for the excursion by the expense of one
- Answer
  a) Rs.131400 b) Rs.6254 c) Rs.1314 d) Rs.625400

26) Madhav bought 13 different coloured pens from a sop and as cost he paid a total of rupees 32.50. What is the cost of one pen?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Divide the cost of pen by the number of pen
  b) Divide the number of pen by the cost of pen
  c) Multiply the cost of pen by number of pen

- Answer

  a) Rs.2 b) Rs.2.5 c) Rs.3 d) Rs.3.5

27) English examination was conducted in the two divisions of seventh standard. From division A 42 out of 45 and from B 44 out of 48 passed the exam. Which class got great achievement?

- What is to be found out

  .....

- Essential information to solve the problem

  a) Finding the greatest among 42 and 44

  b) Finding the greatest among $\frac{42}{45}$ and $\frac{44}{48}$

  c) Finding the greatest among $\frac{45}{42}$ and $\frac{44}{42}$

- Answer

  a) B b) A c) Both are equal d) None of these

28) Vyshnav bought 13.5 metres of rope to plant snake gourd in his vegetable garden. Then he cuts the rope into 1.5m length pieces and made roof. How many 1.5m length pieces will be there?

- What is to be found out

  .....

- Essential information to solve the problem

  a) Divide the total length of rope by 1.5

  b) Divide length of each piece by total length of the rope

- Answer

  a) 6m b)7m c) 8m d) 9m

29) The school bought 2000 sweets to distribute on republic day. One packet contains 40 sweets. How many packets will be there?

- What is to be found out

  .....

- Essential information to solve the problem

  a) Multiply the number of sweets by 40

  b) Divide the total number of sweets by number of sweets in a packet

  c) Divide the number of sweets in a packet by total number of sweets

- Answer

  a) 500 b) 1000 c) 50 d)80000

30) Parvathy bought 6kg rice and 2kg sugar, which cost Rs.22.50 and Rs.28.50 per kilogram respectively. Find the total amount of money she spends?

- What is to be found out

  .....

- Essential information to solve problem
  a) Adding the cost of 1kg rice and sugar
  b) Multiply the cost of 1kg of rice by 6 add that number to the 2 times the cost of kg of sugar
- Answer
  a) Rs.248 b) Rs.61 c) Rs.252 d) Rs.65

31) Manu opened his piggy bag to find 30 coins of 50 paisa, 40 coins of Rs.1, 15 coins of Rs.2, 14 coins of Rs.5 and 5 coins of Rs.10. what is the total amount that he has?

- What is to be found out

  .....

- Essential information to solve problem
  a) Multiply the number of coins by its denomination then find its sum
  b) Finding the total denomination of coins
  c) Adding the number of coins
- Answer
  a) Rs.205 b) Rs.230 c) Rs.104 d) Rs.220

32) Height of Maya, Masi, Gadha are 140.01cm, 140.40cm and 140.05 cm respectively. How will they stand in the assembly to their heights?

- What is to be found out

  .....

- Essential information to solve the problem
  a) Arrange the decimals in descending order
  b) Arrange the decimals in ascending order
- Answer
  a) Maya, Gadha, Masi b) Gadha, Masi, Maya
  c) Masi, Maya, Gadha d) Maya, Masi, Gadha

33) Consumption of electricity (in units) for 4 months in Devika's and Fathima's house is as follows

Month / Person	April	May	June	July
Devika	85	77	80	78
Fathima	78	89	70	80

Among them which family is controlling their average electricity usage as role model to others?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Finding the average electricity usage
  b) Comparing each months electricity usage
- Answer
  a) Fathima b) Devika c) Both d) None of these

34) 46% of 45 students from division A and 40% of 50 students from division B of sixth standard got A grade in all the subjects in the half yearly examination. Find the division which got more A grade?

- What is to be found out
  .....
- Essential information to solve the problem
  a) Finding the greatest among 45 and 50
  b) Comparing the 46% of 45 and 40% of 50
- Answer
  a) A b) B c) Both d) None of these

35) Johnson prepared juice by mixing $2\frac{2}{5}$ cup of orange juice, $2\frac{1}{5}$ cup of lime and $2\frac{2}{5}$ cup of pine apple juice. Then how many cups of juice he prepared?

- What is to be found out

  .....

- Essential information to solve the problem
  a) By adding all the measures
  b) By multiplying all the measures
- Answer
  a) 6 b) 8 c) 7 d) 5

APPENDIX IV

PERCENTILE NORMS OF PROBLEM SOLVING ABILITY IN MATHEMATICS AMONG UPPER PRIMARY SCHOOL STUDENTS OF KERALA

		PSA1	PSA2	PSA3	Total
Percentiles	10	4.00	14.00	10.00	34.00
	20	13.00	16.00	12.00	42.60
	25	15.00	17.00	12.00	45.50
	30	17.40	17.00	13.00	49.00
	40	20.00	19.00	15.00	55.20
	50	23.00	20.00	17.00	60.00
	60	25.00	21.00	19.00	64.00
	70	28.00	22.00	21.00	68.60
	75	29.00	23.00	21.00	70.00
	80	30.00	24.00	22.00	72.40
	90	33.00	26.00	26.00	79.00

APPENDIX V

LIST OF SCHOOLS

Sl.No.	Name of the institution	No. of Students
1	Government Girls H.S. School, Talassery.	54
2	Ramavilasam H. S.School, Chokli	35
3	H.I.M.U.P.School , Kalpetta	38
4	S.K.M.J.H.S.School, Kalpetta	59
5	St. Joseph Boys Higher Secondary School, Kozhikode	33
6	G.V.H.S.S ,Cheruvannur	29
7	G.V.H.S.S, Meenchanda	49
8	Venerni English Medium H.S.S, Farook college	45
9	N.S.S U.P School, Meenchanda	32
10	G.H.School, Nallalam	37
11	G.V.H.S.School, Kondotty	25
12	R.H.S.School, Vaidyarangadi	35
13	PMG H.S.School, Palakkad	33
14	B.E.M.H.S.School, Palakkad	46