Chapter - I

INTRODUCTION

Mathematics has an important role for the development of science and technology. Mathematics helps people to understand and interpret very important quantitative and qualitative aspect of living and natural phenomena. Realizing the importance of mathematics Andre Hichnerwolez, former president of the international Commission for the teaching of mathematics has stated the role of mathematics.

In the realm of science, mathematics has a special position. It is an independent discipline but it also provides other disciplines with a tool for their thinking. In all our efforts to understand the physical world, the trend is very frequent towards the construction of those major theories which seek to represent wide segment of the physical world as subtly as possible and do it in mathematical terms. It is desirable to check these theories of some imaginary world and this is done by assorting judiciously designed experiments and mathematical deductions.

For understanding of every discipline, mathematics is essential. Without having mathematical knowledge it is very difficult to understand any other disciplines such as economics, physics, chemistry, social science, psychology, engineering etc. Accepting the need and implication of mathematics in daily life, Roger Bacon said,

> Mathematics is the gate and key of the science … Neglect of mathematics work injury to all knowledge, since he who is ignorant of it can not know the other sciences or it can not know the other sciences or the things of world. And, what is worse, men who are thus ignorant are unable to perceive their own ignorance and so do not seek a remedy. (Eves, 1983)

For developing the mathematical knowledge and skill in solving the daily life problem, teaching of mathematics in every level of school education, perceived as a gateway of higher tertiary of education of different fields, has been accepted to be essential in each country.

In the context of Nepal mathematics has been accepted as one of the components of education system since the time of Vedic Period. During the period, of Vedas, the sacred writings of the Hindus were composed one of these treats mathematics.

Formerly mathematics had been included as a subject of instruction in every level with the establishment of Durbar High School in 1854 AD during the Rana regime. Till 1950 AD, the progress of education in Nepal was taking place neither at sufficiently quick take place nor in a really systematic manner. Since the dawn of democracy in 1951 AD an awareness of the value of education swept through the country. New schools came to be established and school enrollment increased on an unprecedented scale. In 1971 AD National Education System Plan (NESP) was introduced with aim of systematic development in the country. NESP declared the national, level wise and class wise objectives and developed new curriculum for every level of schools. The NESP mathematics curriculum (1971 AD) has stated the role of mathematics in every life in the following words.

> A well grounded understanding of mathematics is essential for every day life as well as for higher study in the field of science and technology ..... students apply mathematical concept, skill, logical reasoning to many different kind of problems not only as student but also as adult. No matter, what occupation student choose in his adult life, a mastery of mathematical concept, skill and processes will certainly increase his efficiency and effectiveness. (Sidhu, K.S. 1997)

NESP has also emphasized in making mathematics life oriented. Mathematics has been taught as a compulsory subject in each level of school education system in Nepal.

1.1. Historical Background of Teacher Training in Nepal

Training can be defined in different ways. It is a process to impart special skill to a person through practice. Teacher training is a programme in which they are trained to teach their students using scientific techniques and methods.

"Training is to prepare or be prepared for a job, activity or sport, by learning skills or by mental or physical exercise." (Cambridge International Dictionary of English, 1995:1548) It is an occasion of practicing skills and doing exercise. According to Oxford Advanced Learner's Dictionary Training is "process of preparing or being prepared for a sport or job."

Training is a process of assisting a person in enhancing his or her efficiency and effectiveness at work by improving knowledge, developing skills and cultivating appropriate attitudes and behaviour towards works.

Training is taken as instrument to increase knowledge and change conception and teaching skills. Training enhances personal development, protects from decreasing capacity, brings efficiency in working style and encourages a person to work.

Education is the basis for constructing human resource. Such human resource can be achieved through quality education. Therefore investment used in education is for producing manpower equipped with knowledge skill and capacity. School education is the basis for constructing manpower necessary for the nation.

In the context of Nepal formal education started in 1843. Before this, informal education used to be provided in hermitages and monasteries. Before 1950 (The year of establishment of democracy in Nepal) no efforts were made for the development of education except the establishment of Tri-Chandra College and few schools in 1939.

With the establishment of schools, some efforts were made for the training of teachers. Professional competency is essential for the teaching profession as in other fields. Training is necessary for a teacher to enhance professional ability and to become a successful teacher. Training also helps to increase knowledge and skills. Similarly it also helps to increase proficiency and refreshment for a teacher. To make teaching learning smooth and effective, to enhance the professional ability, to introduce the rapid changing teaching method and technology, to educate students according to time, to use new approaches and child psychology in teaching, to develop skill in constructing instructional materials and use them, to

enable to adopt evaluation technology, to make teaching materials and use scientific technology, teacher training is essential.

Basic Teacher Training Centre, which was established in the year 1947, which was established with the basic education, can be taken as formal beginning of teacher training programme. In this way beginning of teacher training was made with the establishment of Basic Education. After the political change of 1950 this Centre became passive because of the closing of schools of basic education. The Basic Teacher Training Centre was converted to Nepal Teacher Teaching Centre in the year 1956. Three months basic training used to be provided for secondary level passed, experienced primary teachers by it. Those who studied up to class ten were trained and made teachers in the newly opened schools. Later training period was increased and made for 10 months.

According to the Report of Nepal National Education Planning Commission (1954), College of Education was established in the year 1957. After that pre-service training was held. In this Bachelor level was programmed for one year, Intermediate for two year and SLC for four years. By this, mobile training was organized for teacher training. In teacher teaching or training programme normal school training, education teacher training, vocational training, far area teacher training, women teacher training etc. were organized by College of Education.

Tribhuvan University was established in the year 1959 AD. After the establishment of NESP in 1971 AD training was made compulsory and minimum qualifications for Primary, Lower Secondary and Secondary level were determined SLC, Proficiency C. Level and Bachelor level respectively. Institute of Education was established in TU for providing Pre-service training and On-service training for training of the teacher. Previous Institutions related to training i.e. College of education, English Language Training Center, National Vocational training center, Primary school teacher training center, were combined to Institute of Education.

This was the gradual development in the field of teacher training.

1.2. Statement of the Problem

Does the mathematics' achievement of the students taught by trained teachers differ from the students taught by untrained teachers?

Does the mathematics achievement of the boys differ from girls?

Does the mathematics achievement of the boys taught by trained teachers differ from the boys taught by untrained teachers?

Does the mathematics achievement of the girls taught by trained teachers differ from the girls taught by untrained teachers?

1.3. Objectives of the study

This study is intended to accomplish the following objectives:

- To find out the difference in mathematics achievement of students taught by trained and untrained teachers.
- To compare the mathematics achievements of the boys and girls.
- To compare the mathematics achievement of the boys taught by trained and untrained teachers.
- To compare the mathematics achievement of the girls taught by trained and untrained teachers.

1.4. Significance of the Study

Mathematics is an essential part of school curriculum which is taught from primary level to secondary 1evel as a compulsory subject. It is generally agreed that every one needs the fundamental knowledge of mathematics in daily life.

There are several studies towards the comparative study of mathematics achievement in Nepal. Some of them are related to find out the achievement of the students in mathematics using various independent variables. But the research of students taught by trained teachers and untrained teachers in lower secondary level are not conducted yet. So the researcher wanted to compare the achievements in mathematics of students taught by trained and untrained teachers in Kaski district.

What are the achievements of students in mathematics taught by trained and untrained teachers? What differences are there in their achievements? What are the related questions of this study? In the content researcher wanted to study their achievements comparatively. So the researcher has decided to study on this topic.

This study would provide information for the mathematics teacher and student of lower secondary level. It would help the teacher to use appropriate teaching method in different situations. It would provide valuable information to curriculum developers and to those persons who are interested to the teaching learning field. The result of this study would provide information- to the teachers, parents and students about the achievement level of students taught by trained teachers and untrained teachers. Thus the study is significant for the reason that: it would help to provide informations to the concerned agencies to reform and improve the mathematics teaching at lower secondary level.

1.5. Statement of the Research Hypothesis

1.5.1 Research Hypothesis:

The research hypotheses formulated for the study are as follows.

- There is no significant difference between mathematics achievement of students taught by trained and untrained teachers.
- There is no significant difference between the mathematics achievement of boys and girls.
- There is no significant difference between the mathematics achievements of boys taught by trained teachers and untrained teachers.
- There is no significant difference between the mathematics achievements of girls taught by trained teachers and untrained teachers.

1.5.2 Statistical hypothesis

I) $H_0: \mu_1 = \mu_2$ (Null hypothesis)

$H_1: \mu_1 \neq \mu_2$ (Alternative hypothesis)

Where μ_1 and μ_2 are respectively the corresponding parametric means of students taught by trained and untrained teachers of lower secondary level.

II) $H_0: \mu_3 = \mu_4$ (Null hypothesis)

$H_1: \mu_3 \neq \mu_4$ (Alternative hypothesis)

Where μ_3 and μ_4 are respectively the corresponding parametric means of boys and girls.

III) $H_0: \mu_5 = \mu_6$ (Null hypothesis)

$H_1: \mu_5 \neq \mu_6$ (Alternative hypothesis)

Where μ_5 and μ_6 are respectively the corresponding parametric means of boys taught by trained teachers and untrained teachers.

IV) $H_0: \mu_7 = \mu_8$ (Null hypothesis)

$H_1: \mu_7 \neq \mu_8$ (Alternative hypothesis)

Where μ_7 and μ_8 are respectively the corresponding parametric means of girls taught by trained and untrained teachers.

1.6. Limitation of the Study

The study has the following limitations:

a) This study was limited to the Public schools of Kaski district.

b) This study included only seventh grade pupils taught by trained teachers and untrained teachers.

c) Some of the variables like class situation, age group. I.Q. socio-economic status was not controlled.

d) This study included the schools in which trained and untrained teachers were teaching.

1.7. Definition of Terminology

a) **Achievement:** In this study, student's achievement means the score obtained by the students on the test which is prepared by the researcher.

b) **Public Schools:** In this study public schools are those schools which **receive** the government grant for the salary of the teachers and other purposes.

c) **Trained Teacher:** Teachers who have passed Certificate Level of Education (c. ed.) or who have received 10 months in-service training after completion of his/her I A., I.Com, I.Sc. levels.

d) **Untrained Teacher:** The teachers who have passed other faculties like Arts, Science and Commerce with no any specific training.

e) **Lower Secondary Level:** The level in which class 6 to 8 is taught.

This study includes Lower Secondary, Secondary, or Higher Secondary level schools. However achievement test would be given only to those students, who are studying at class VII.

CHAPTER - II

REVIEW OF RELATED LITERATURE

The review of related literature deals with the theories or research studies which have been already done by the scholars. It helps to conduct new research in a systematic manner by providing general outline of this research study and avoids the unnecessary duplications. Realizing the importance of literature review, some are made here to present the significant results of the conclusions of different studies mainly focusing on mathematical achievements of the students which are relevant to the present study.

Pathak (1986) did his research on "A Study of the Problems Faced by the Teachers of Kathmandu District in the Implementation of Mathematics Curriculum for Lower Secondary School." In this study, out of 87 lower secondary teachers only 65 were selected in his study. He had a set of structural questionnaire consisting of the problems regarding objectives, teaching methods, instructional materials and evaluation techniques. The set of questionnaire was also related with the opinion of the teachers on the above problems. In his study he discovered that the Lower Secondary Schools were having problems in selecting proper evaluation methods.

Gurung (1997) made a comparative study of achievement of the public and private schools situated in urban and rural regions in Lamjung district in his research entitled Concept of Set. He found that the students studying in the schools of urban areas have higher achievement than the students studying in the schools of rural areas. The achievement of private schools was found significantly higher than that of the public schools.

Sah (2000) conducted a study entitled "A comparative study of achievement in mathematics of lower secondary level students of different ethnic groups" including 150 Brahmin, Sah and Chaudhary students of grade eight of the public schools in Saptary district concluded that the achievement of Brahmin students were higher than that of the Sah and Chaudhary students.

Shrestha (1975) made a comparative study on the achievement of the students in mathematics through discovery method and traditional method of teaching and found that the achievement of the students taught by discovery method was higher than that taught by traditional method.

Paudel (2006) made a comparative study on mathematics achievement of secondary level students taught by trained and untrained teacher. He concluded that the achievement scores of the students taught by trained teacher is significantly higher than the students taught by untrained teachers.

Timilsina (2004) conducted a mathematics achievement of secondary level students taught by the teacher with education background. He found that the achievement of students taught by the teachers with education is higher than the achievement of students taught by the teachers with out education backgoung.

Maccoby and Jacklin (1974) said that although both boys and girls have equal educational opportunity, it is fairly well established in the western countries that boys are superior to girls in mathematical ability.

Bhattarai (2006) made a achievement of students at grade five in mathematics taught by trained and untrained teacher in Kathmandu district. He concluded that the mathematics achievement scores of the students taught by trained teacher is more than the scores of students taught by untrained teachers.

Thapa (2002) conducted a study entitled "A Comparative Study of Mathematics Achievement of Normal and Deaf students of Primary Level". In a sample of 100 students (50 normal and 50 deaf) of grade five from 4 sample school (2 normal and 2 deaf schools) in Kaski and Kathmandu districts showed that -

a) the mean of mathematics achievement of normal students was higher than that of deaf students and there is significant difference between their mean scores,

b) the mean of mathematics achievements of boys was found higher than that of girls and there is significant difference between their mean scores,

c) the mean of mathematics achievements of normal boys was found higher than that of deaf boys and there is significant difference between their mean scores,

d) the mean of Mathematics achievement of normal girls was found higher than that of deaf girls and there is significant difference between their mean scores,

e) the mean of mathematics achievements of primary level students of Kathmandu district was found higher than that of Kaski district and there is no significant difference between their mean scores.

Amatya (1978) conducted a thesis entitled "A Comparative Study on the Effectiveness of Teaching Mathematics with and without the use of instructional materials." He concluded that the achievement of students taught by using instructional materials is significantly higher than the achievement of students taught without using instructional materials.

Maskey (1975) conducted a comparative study on mathematics achievement of primary school students under different class sizes. This study was made to investigate the effect of the class size in the achievement of students in mathematics at the third grade level of primary school in Birgunj Town Panchayat. He found that students studying in small size achieved higher than the students studying in large size class.

Teacher's motivation to the students and student's active involvement influence the achievement of students in mathematics. This idea is supported by Khatiwada (1974) and concluded in his Master's Degree thesis that teaching was more pupil centred in the classes conducted by the trained teachers than in the classes conducted by the untrained teachers. He found that relationship between the student's activities and the achievements of the students were found to be significantly related.

Poudel (2003) conducted a study entitled “A Study of Mathematics Achievement of Tibetan and Nepalese Students of Primary Level”. In a sample of 150 students (75 Tibetan students and 75 Nepalese Students) of grade five from 8

samples School (4 Tibetan schools and 4 Nepalese schools) in Kaski and Kathmandu districts showed that:

a) The mean score of Mathematics achievement of Nepalese Students was higher than that of Tibetan Students and there is significant difference between their mean scones.

b) The mean scores of boys are higher than girls and there is significant difference between their mean scores.

c) The mean scores of Nepalese boys are higher than that of Tibetan boys and there is significant difference between their mean scores.

d) The mean score of Mathematics achievement of Nepalese girls is higher than that of Tibetan girls and there is not significant difference between their mean scores.

The mean of Mathematics achievements of primary level students of Kathmandu district found higher than that of Kaski district and there is no significant difference between their mean scores.

After analyzing and reviewing these studies, the researcher arrives at the conclusion that, the research study has been fruitful to find out various problems faced by students in the process of mathematics learning. This study was helpful to compare the achievement of the boys and girls who are taught by trained and untrained teachers in mathematics.

CHAPTER - III

METHODOLOGY

3.1. Design of the Study

This chapter consists the frame work of the study. It describes the procedures of the design of study which are to be carried out to achieve the objective of the study. This chapter includes the population and sample of the study, the method of sampling, the instruments in collecting data and information and the statistical tools and techniques.

The researcher adopted the survey method in this study being the socio-cultural aspect in facing different problems. Also, the achievement of students does not take any laboratory experiment. That's why it is a survey type study among the mathematics students.

3.2. Population of the Study

This study was undertaken for the purpose of mathematics achievement of students taught by trained and untrained teachers. So the population of the study consisted of the students of grade seven from some schools taught by trained teachers and untrained teachers in Kaski district.

3.3. Sample of the Study

The sample size of the students for this study was 128. In the process of taking sample, the researcher contacted District Education Office (DEO) Kaski and collected 4 schools taught by trained teachers and 4 school taught by untrained teachers randomly. At the second stage, 16 students were selected randomly from each sample school with the cooperation of headmasters and teachers. Out of 128 students, 64 students were selected from the school taught by trained teachers and 64 students were selected from the school taught by untrained teachers. Thus,

altogether the sample of the study consists of 128 students. Table 1 gives the detailed description of the sample.

Table : 1

Distribution of Sample

S.N.	Name of the Schools	Taught by trained teachers		Taught by untrained teachers		Total
		Boys	Girls	Boys	Girls	
1.	Sangam Secondary School, Lumle-4, Kaski	-	-	7	9	16
2.	Dharmasthali Lower Seocndary School, Pokhara-5, Kaski	6	10	-	-	16
3.	Shree Maheswari Lower Secondary School, Pumdi Bhumdi-3, Kaski	-	-	12	4	16
4.	Shree Bindyabasini Higher Secondary School, Pokhara-2, Kaski	7	9	-	-	16
5.	Shree Bhadrakali Higher Secondary School, Pokhara-15	-	-	8	8	16
6.	Shree Dharapani Secondary School, Dhikurpokhari-5, Kaski	7	9	-	-	16
7.	Shree Udaya Secondary School, Dhampus-5, Kaski	5	11	-	-	16
8.	Shree Siddha Secondary School, Pokhara-15	-	-	8	8	16
	Total	25	39	35	29	128

3.4 Instruments

3.4.1. Construction

The main instrument for this study was achievement test paper. So, the researcher constructed an achievement test consisting 60 multiple choice items covering the contents of grade seven mathematics. The items were from the different areas of mathematics i.e. arithmetic, algebra and geometry. There were 29 (48.33%) items from arithmetic, 15 (25%) items from algebra and 16 (26.66%) items from geometry. In achievement test paper containing 14 (23.33%) items from knowledge, 18 (30%) items from skill, 15 (25%) items from comprehension and 13 (21.66%) items from application level of cognitive domain. The test items covering different areas of mathematics and different level of cognitive domain are shown in the following table.

Table – 2

Item Covering Area of Mathematics and Levels of Cognitive Domain

S.N.	Cognitive Domain / Areas	K	S	C	A	Total
1	Arithmetic	6	11	7	5	29 (48.33%)
2	Algebra	2	5	4	4	15 (25%)
3	Geometry	6	2	4	4	16 (26.66%)
	Total	14 (23.33%)	18 (30%)	15 (25%)	13 (21.66%)	60 (100%)

Where K = knowledge, S = skill, C = comprehension, and A = application

3.4.2 Validation and Reliableness

The content validity of the test was established by its approval from the mathematics education experts, school teachers and thesis advisor. For the reliability of the test the investigator carried out pilot study of the test prepared. 45

students of Rastriya Higher Secondary School, Bagar-1, Pokhara were used for pilot study. Before administering the test paper, the investigator instructed the students how to respond the test paper.

To obtain the reliability of the achievement test, the scores of 24 students in the item analysis chart, (Appendix - XI) have been denoted by the alphabets in the first column of the table in Appendix – XIII. The scores on the odd & even items of 60 items have been shown in second and third columns. The sums and difference, between these 24 pairs of half test scores have been shown in fourth and fifth column (Appendix - XIII)

Since 27 percent of 24 students are approximately six, the six highest sums and the six lowest sums in the fourth column are identified by the letters 'H' and 'L' respectively. The sum of the highest six sum score is 271and the sum of the lowest six sum score is 98. So, the difference between these sums is equal to 173. The squared difference equals to 29929. By the same process, the value 484 is calculated from the squared difference between the sum of six highest difference scores and six lowest difference scores. The quotient 484 divided by 29929 is subtracted from one to get the reliability, which is found to 0.98 approximately.

3.4.3 Refinement

The test was refined by eliminating it's inappropriate items. Item Analysis Table determines the Difficulty Index (P–value) and Discrimination Index (D-value) of each item in the instrument. The P-value and D-value of each item were calculated from the 27 percent of the highest scores and 27 percent of the lowest scores of 45 students participating in pilot test. Taking into account of the P-value and D-value of each item, as Mentioned by Singh (1997) on Test, Measurement and Research Methods in Behavioural sciences only those items were selected whose P-value is ranging between 30 to 70 percent and D-value is 0.20 to 0.70. In this way 20 items were rejected and the remaining 40 items were accepted for the final form (Appendix-XI). Thus, the refined achievement test paper contains only 40 items. (Appendix I & II)

3.5 Procedure of Data collection

Prior to the administration of the achievement test, the researcher visited each of the selected schools. The researcher met the headmasters and explained in detail the purpose of the visit and sought permission and appointment to visit the school on the next day. The tool for the study was administered on a sample of 128 students from the schools included in the sample. Before administering the test, the researcher explained the answering procedure of mathematics achievement test to the students. The time allocated for completing the test was one hour. After the time duration of examination the answer sheets were collected and scored by the researcher and scores were tabulated for the analysis.

3.6. Data Analysis Procedure

The data were collected by administering achievement test paper among the sample students. The collected data were analyzed by the mean, standard deviation, two tailed t-test and z-test of the 0.05 level of significance.

CHAPTER - IV

ANALYSIS AND INTERPRETATION

The data for the study were collected from grade seven students. The collected data were tabulated and analyzed for the study of attainment of objectives and verification of the hypothesis.

This chapter deals with the statistical analysis and interpretation of data obtained from the scores obtained by the sample students in the achievement test. These data were tabulated and analyzed using mean, standard deviation and two tailed t-test. The data of the achievement test scores were analyzed under the following headings

1. Comparison of the mathematics achievement of the students taught by trained and untrained teachers.
2. Comparison of the mathematics achievement of the boys and girls.
3. Comparison of the mathematics achievement of the boys taught by trained and untrained teachers.
4. Comparison of mathematics achievement of the girls taught by trained and untrained teachers.

4.1. Comparison of the Mathematics Achievement of the Students Taught by Trained and Untrained Teachers

The mean, standard deviation and corresponding z-value of the scores obtained by the students taught by trained and untrained teachers are presented in table-3.

Table-3

Group	No. of cases	mean	S.D.	z- value	conclusion
students taught by trained teacher	64	26.45	5.69	2.008	significant at 0.05 level
students taught by untrained teacher	64	24.32	6.25		

$^{Z}0.025, 126 = 1.96$ at 0.05 level of significance

From the above table it is observed that the mean score of the students taught by trained teachers and the students taught by untrained teachers are 26.45 and 24.32 respectively. Therefore, the mean score of students taught by trained teachers is higher than the mean score of students taught by untrained teachers by 2.13. Since the calculated z-value is greater than the tabulated value ($^{Z}0.025, 126 = 1.96$).

Hence, this difference in mean is significant at 0.05 levels. It indicates that there is difference between the mean achievement of students taught by trained teachers and taught by untrained teachers at 0.05 levels. Hence, the null hypothesis of no significant difference between the mathematics achievement of students taught by trained and untrained teachers is rejected and the alternative hypothesis is accepted.

4.2. Comparison of Mathematics Achievement of Boys and Girls

The mean, standard deviation and corresponding z- value of the scores obtained by boys and girls are tabulated below.

Table-4

Group	No. of cases	Mean	S.D.	z-value	conclusion
Boys	60	27.16	5.94	3.564	Significant at 0.05 level
Girls	68	23.51	5.61		

^{Z} 0.025, 126 = 1.96 at 0.05 level of significance

From the above table, it is seen that the mean score of boys and girls are respectively 27.16 and 23.51. Therefore, the mean score of boys is higher than the mean score of girls by 3.65. Since, the calculated z-value is greater than the tabulated value ($^{Z}0.025, 126 = 1.96$). Hence, this difference in means is found significant at 0.05 levels. It indicates that there is difference between the mean achievement of boys and girls at 0.05 levels.

Hence, the null hypothesis of no significant difference between the mathematics achievement of boys and girls is rejected and the alternative hypothesis is accepted.

4.3. Comparison of Mathematics Achievement of Boys Taught by Trained Teachers and Boys Taught by Untrained Teachers.

The mean, standard deviation and corresponding t-value of the scores obtained by boys taught by trained teacher and boys taught by untrained teachers are tabulated below:

Table-5

Group	No of cases	Mean	S.D.	t-value	Conclusion
Boys taught by trained teacher	25	28.96	4.02	2.29	Significant at 0.05 level
Boys taught by untrained teacher	35	25.77	6.7		

$^{t}0.025, 58 = 1.96$ at 0.05 level of significance

Above table shows that the mean scores of boys taught by trained teachers and taught by untrained teachers are respectively 28.96 and 25.77. Therefore, the mean scores of boys taught by trained teachers, is higher than the mean score of boys taught by untrained teachers by 3.19. Since the calculated t-value is greater than the tabulated t-value ($^{t}0.025, 58 = 1.96$). Hence, this difference in means is found significant at 0.05 levels. It indicates that there is difference between the boys taught by trained teachers and taught by untrained teachers.

Hence, the null hypothesis of no significant difference between the boys taught by trained teachers and boys taught by untrained teacher is rejected and the alternative hypothesis is accepted.

4.4. Comparison of Mathematics Achievement of Girls Taught by Trained and Untrained Teachers.

The mean, standard deviation and corresponding t-value of the scores obtained by girls taught by trained and untrained teacher are tabulated below.

Table-6

Group	No of cases	Mean	S.D.	t-value	Conclusion
Girls taught by trained teacher	39	24.74	5.75	1.62	Insignificant at 0.05 level
Girls taught by untrained teacher	29	22.58	5.20		

^{t} 0.025, 66 = 1.96 at 0.05 level of significance

By above table, it is observed that the mean scores of girls taught by trained teacher and taught by untrained teachers are 24.74 and 22.58 respectively. Therefore, the mean scores of girls taught by trained teacher, is higher than the mean score of girls taught by untrained teachers by 2.16. Since the calculated t-value is less than the tabulated t-value (^{t}0.025, 66 = 1.96). Hence, this difference in means is found insignificant at 0.05 levels. It indicates that there is no difference between the mean achievements of girls taught by trained teachers and untrained teachers.

Hence, the null hypothesis of no significant difference between the mathematics achievement of girls taught by trained teachers and taught by untrained teachers is accepted and alternative hypothesis is rejected.

CHAPTER - V

SUMMARY, FINDINGS AND RECOMMENDATIONS

After the analysis and interpretation of the collected data an attempt has been made to summarize to enlist the findings and some recommendations for further study. The first section of this chapter presents the summary of the research the second section presents its findings and the last section presents recommendations based on the findings of the study.

5.1. Summary

This study was concerned with the study of mathematics. Achievement of Lower Secondary Students Taught by Trained and Untrained Teachers in Kaski District. For this study, the researcher developed the achievement test paper with the help of prescribed curriculum and text book of mathematics of grade. Seven and administered the test in Rastriya Higher Secondary School, Purano Tudikhel, Pokhara for the item analysis of the test paper and for checking its reliability and validity to standardize test. This test paper was the main instrument used for the study.

For this study, the researcher selected 128 students. (64 students taught by trained teachers and 64 students taught by untrained teachers) randomly as a sample from four schools taught by trained teachers and four schools taught by untrained teachers. The standardize test paper was administered to sample students in all those schools. The score of 128 students were analyzed by using the mean, standard deviation, two-tailed t-test and z-test under the following (headings) objectives:

i. Comparison of the mathematics achievements of the students taught by trained and untrained teachers.
ii. Comparison of the mathematics achievement of the boys and girls.

iii. Comparison of the mathematics achievement of the boys taught by trained and untrained teachers.
iv. Comparison of mathematics achievement of the girls taught by trained and untrained teachers.

5.2. Findings

The statistical analysis of the collected data yielded the following results as the findings of the study.

i. The mean scores of the students taught by trained teacher is 26.45 and untrained teachers is 24.32. So the mean score of students taught by trained teacher is higher than the students taught by untrained teacher by 2.13. Hence, this difference in means is found significant at 0.05 level.
ii. The mean scores of boys and girls are 27.16 and 23.51 respectively. The mean score of boys is higher than girls by 3.65. Hence, this difference in means is found significant at 0.05 level.
iii. The mean scores of boys taught by trained teachers is 28.96 and the mean score of boys taught by untrained teacher is 25.77. The mean score of boys taught by trained teacher is higher than the boys taught by untrained teacher by 3.19. Hence, this difference in means is found significant at 0.05 level.
iv. The mean scores of girls taught by trained teacher is 24.74 and the mean score of girls taught by untrained teacher is 22.58. The mean score of girls taught by trained teacher is greater than by 2.16. Hence this difference in means is found insignificant at 0.05 level.

5.3. Recommendations

After conducting this study, the researcher got some findings. On the basis of those findings, the researcher would like to suggest some recommendation for the improvement in mathematics instructions at lower secondary level.

i. This study was conducted in Kaski district. To get more valid and reliable result it would be better to extend to nation-wide.
ii. The study of this kind should be conducted at all levels of school and in other subjects as well.
iii. This study was limited to the students of grade seven from eight schools. (4 schools taught by trained teachers and 4 schools taught by untrained teacher) of Kaski districts, hence the researcher can not generalize the finding of this study to all grades and the whole country. So the similar study should be done regional wise as well as national wise in order to establish the finding of the study.
iv. It is better to research on trained and untrained teachers in various aspects in various level.
v. This study shows that mathematics achievement of the students taught by untrained teachers is comparatively low. To find out the causes of this poor result, it is necessary to go for further research. So the concerned authority, educational policy makers and teachers in school management should pay special attention to the students taught by untrained teachers education and design a better plan to promote their educational level.

Student's and parental attitude towards mathematics, teacher's attitude towards students and in mathematics, social status and others factors contributing to student's achievement play a significant role in the achievement of mathematics but this study didn't tell anything about these matters. Further study should be intended on these areas.

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Appendix - I

pknlAw dfkg k/LIff

कक्षा : सात | पूर्णाङ्क: ४०

विषय : गणित | उत्तीर्णाङ्क: १३

समय: ४० मि

विद्यार्थीको नाम :- **रोल नं.-**

विद्यालयको नामः-

निर्देशन: *दिइएका प्रत्येक प्रश्नको चारवटा उत्तर (a, b, c, d) मध्ये सही उत्तरमा ठीक (√) चिन्ह लगाऊ । जस्तैः-*

उदाहरण: तलका मध्ये 16 को वर्गमूल कुन हो ?

a. 2 b. 8 c. 4 d. 12

Questions:

प्र.नं.१. यदि A= {a, b, c, d, e} र B= {d, e, f, g, h} भए A B कति हुन्छ ?

a. {a, b} b. {c, d} c. {d, e} d. {g, h}

प्र.नं.२. निम्नमध्ये 22 को वर्गसंख्या कति हुन्छ ?

a. 144 b. 256 c. 484 d. 444

प्र.नं.३. निम्नमध्ये 625 को वर्गमूल कति हुन्छ ?

a. 25 b. 21 c. 18 d. 16

प्र.नं.४. $2\sqrt{2} \times 3\sqrt{2}$ को मान कति हुन्छ ?

a. 25 b. 10 c. 12 d. 16

प्र.नं.५. 24 र 48 को ल.स. (L.C.M.) कति हुन्छ ?

a. 21 b. 48 c. 28 d. 34

प्र.नं.६. $4\frac{1}{7}$ लाई दशमलवमा लेख्दा कति हुन्छ ?

a. 4.1428 b. 3.821 c. 0.222 d. 5.232

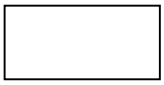
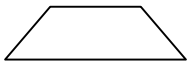
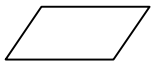
प्र.नं.७. 12.5 लाई प्रतिशतमा लेख्दा कति हुन्छ ?

a. 1250% b. 35% c. 120% d. 212%

प्र.नं.८. $\frac{26}{78}$ को अनुपातलाई न्युनतम पदमा (lowest term) लैजादा कति हुन्छ ?

a. $\frac{1}{5}$ b. $\frac{1}{6}$ c. $\frac{1}{3}$ d. $\frac{1}{2}$

प्र.नं.९. निम्न चित्रमध्ये कुन चित्रका सबै भूजा बराबर हुन्छन् ?

a.  b.  c.  d. 

प्र.नं.१०. यदि ५ वटा कलमको मूल्य रु. ७५ पर्छ भने ८ वटा कलमको मूल्य कति पर्ला ?

a. रु. 120 b. रु. 130 c. रु. 140 d. रु. 150

प्र.नं.११. 3,2,6,3,2,1,0,7 को अंकगणितीय मध्येक (Arithmetic mean) कति होला ?

a. 2 b. 3 c. 4 d. 5

प्र.नं.१२. $(\frac{5}{6})^3 \times (\frac{2}{3})^2$ को मान कति हुन्छ ?

a. $\frac{500}{1944}$ b. $\frac{600}{864}$ c. $\frac{300}{1242}$ d. $\frac{900}{1234}$

प्र.नं.१३. यदि x = 6 र y = 2 भए $\frac{x^2 \Gamma y^2}{x \Gamma y}$ को मान कति हुन्छ ?

a. 2 b. 3 c. 4 d. 5

प्र.नं.१४. $a^3 - b^3$ को सुत्र कुन हो ?

a. $(a+b)^3 - 3ab\,(a+b)$ b. $(a-b)^3 + 3ab\,(a-b)$

c. $a^2+3a^2b+3ab^2+b^3$ d. $a^2+2ab+b^2$

प्र.नं.१५. आयतको परिमिति निकाल्ने सूत्र कुन हो ?

a. l+b b. 2(l+b) c. l×b d. l×b×h

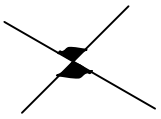
प्र.नं.१६. तलका संख्यामध्ये कुन संख्या रुढ हो ?

a. 16 b. 22 c. 28 d. 29

प्र.नं.१७. यदि a+b = 6 र ab = 7 भए a^3+b^3 को मान कति हुन्छ ?

a. 70 b. 80 c. 90 d. 100

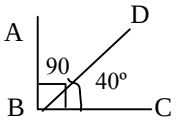
प्र.नं.१८. दिएको चित्रमा रङ लगाइएको कोण कस्तो कोण हो ?



a. संगत कोण b. आसन्न कोण

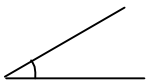
c. एकान्तर कोण d. विपरितार्थक कोण (शिर्षाभिमुख कोण)

प्र.नं.१९. यदि सँगैको चित्रमा ABC = 90^0 र CBD = 40^0 भए ABD को मान कति हुन्छ ?



a. 30º b. 40º c. 50º d. 60º

प्र.नं.२०. सँगैको चित्रमा दिइएको कोण कति डिग्रीको होला नापेर पत्ता लगाऊ ।



a. 30º b. 100º c. 60º d. 150º

प्र.नं.२१. a^2-b^2 को सुत्र कुन हो ?

a. (a+b) (a-b) b.$(a+b)^2$ c. $(a-b)^2$ d. $a^2-2ab+b^2$

प्र.नं.२२. यदि लम्वाई (l) = 12cm, चौडाई (b)= 8cm र उचाई (h)=5cm भएको घनाकार वस्तुको आयतन कति होला ?

a. $270cm^3$ b. $480cm^3$ c. $670cm^3$ d. $220cm^3$

प्र.नं.२३. षष्टभूज (Hexahedron) मा कति ओटा भूजा हुन्छन् ?

a. 4 b. 5 c. 6 d. 7

प्र.नं.२४. $7a+3$ बाट $3a$ घटाउँदा कति हुन्छ ?

a. $2a+1$ b. $3a+2$ c. $4a+3$ d. $5a+4$

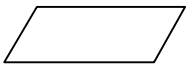
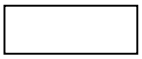
प्र.नं.२५. यदि वर्गको एउटा भूजा 4 cm छ भने त्यसको क्षेत्रफल कति हुन्छ ?

a. $8cm^2$ b. $10cm^2$ c. $16cm^2$ d. $20cm^2$

प्र.नं.२६. समीकरण $-8x+4 = x-8$ मा x को मान कति होला ?

a. $\frac{2}{3}$ b. $\frac{5}{6}$ c. $\frac{4}{3}$ d. $\frac{8}{10}$

प्र.नं.२७. तलका चित्रमध्ये कुन चित्र समानान्तर चतुर्भुज (स.च.) हो ?

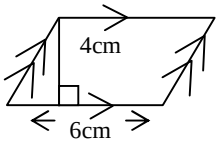
a.  b. 

c.  d. 

प्र.नं.२८. दिइएको चतुर्भुजको क्षेत्रफल कति हुन्छ ?

a. $24cm^2$ b. $25cm^2$

c. $26cm^2$ d. $27cm^2$

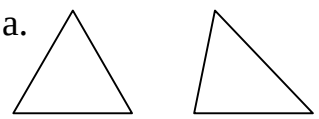
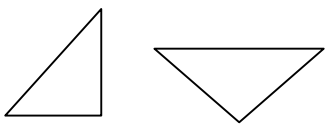


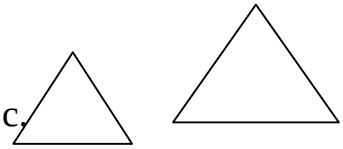
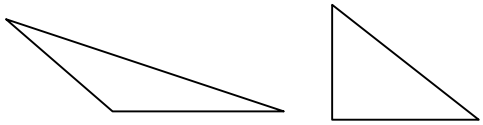
प्र.नं.२९. 4,265,321,264 अंकमा कमा (,) कुन प्रणालीअनुसार दिइएको छ ?

a. राष्ट्रिय प्रणाली b. अन्तर्राष्ट्रिय प्रणाली

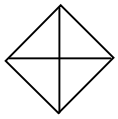
c. रोमन प्रणाली d. कुनै पनि होइन

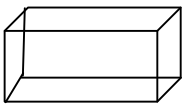
प्र.नं.३०. तलका मध्ये कुन त्रिभूजहरु समरुप छन् ?

a.  b. 

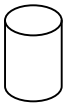
c.  d. 

प्र.नं.३१. तलका चित्रमध्ये कुन चित्र ट्रेटाहेड्रन (tetrahedron) हो ?

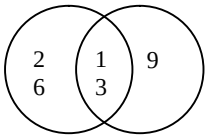
a. 

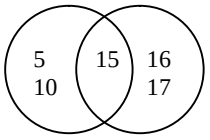
b. 

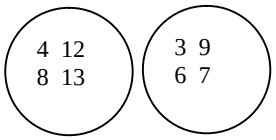
c. 

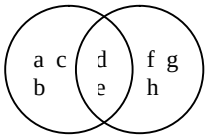
d. 

प्र.नं.३२. तलका मध्ये कुन समूह अलग्गिएको समूह हो ?

a. 

b. 

c. 

d. 

प्र.नं.३३. तलका मध्ये कुन भनाइ ठिक छ ?

a. +7 < -3 b. + 3 > +5 c. -5 > -7 d. +5 < -5

प्र.नं.३४. (-12) ÷ (-4) को मान कति हुन्छ ?

a. 2 b. 3 c. 4 d. 5

प्र.नं.३५. कुनै निश्चित अंकमा 6 जोड्दा त्यसको उत्तर 10 हुन्छ भने त्यो अंक पत्ता लगाऊ ।

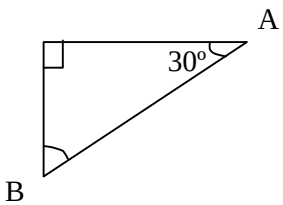
a. 3 b. 4 c. 5 d. 6

C

प्र.नं.३६. दिइएको त्रिभूज ABC मा Δ ABC को मान कति हुन्छ ?

a. 30° b. 40°

c. 50° d. 60°



प्र.नं.३७. तलका मध्ये कुन समपूरक कोण हुन् ?

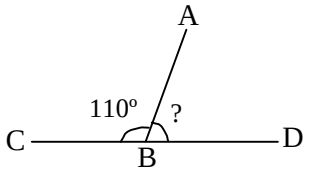
a. 30° र 60° b. 40° र 30°

c. 30° र 50° d. 50° र 10°

प्र.नं.३८. 75% लाई भिन्नमा लेख्दा के हुन्छ ?

a. $\frac{4}{5}$ b. $\frac{3}{5}$ c. $\frac{2}{3}$ d. $\frac{3}{4}$

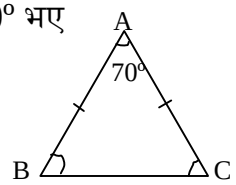
प्र.नं.३९. यदि दिएको चित्रमा $ABC = 110^o$ भए ABD को मान पत्ता लगाऊ ।



a. 45^o b. 80^o

c. 60^o d. 70^o

प्र.नं.४०. दिइएको त्रिभूज ABC समद्विवाहु त्रिभूज हो । यदि $A = 70^o$ भए C को मान कति होला ?



a. 50^o b. 55^o

c. 60^o d. 65^o

Appendix - II

Achievement test exam

Class: 7 F.M. : 60
Subject: Maths P.M. : 19.5

Name of the School:
Name of the Student:

Among the four answers given to each of the following questions only one is correct. Read the question carefully and put the tick mark (√) against the letter (a, b, c or d) which you think is correct.

Example:
which of the following number is square root of 16?
a. 2 b. 8 c. 4 d. 12

Questions:

Q.1. If A= {a, b, c, d, e} and B= {d, e, f, g, h}. Find A B
a. {a, b} b. {c, d} c. {d, e} d. {g, h}

Q.2. Which of the following is the square of 22?
a. 144 b. 256 c. 484 d. 444

Q.3. Which of the following is square root of 625?
a. 25 b. 21 c. 18 d. 16

Q.4. What is the product of $2\sqrt{2} \times 3\sqrt{2}$?
a. 25 b. 10 c. 12 d. 16

Q.5. Which of the following is the lowest common multiple (L.C.M.) of 24 and 48?
a. 21 b. 48 c. 28 d. 34

Q.6. What is $4\frac{1}{7}$ as decimal?
a. 4.1428 b. 3.821 c. 0.222 d. 5.232

Q.7. What is 12.5 in percent?
a. 1250% b. 35% c. 120% d. 212%

Q.8. Which of the following is $\frac{26}{78}$ ratio in its lowest term?
a. $\frac{1}{5}$ b. $\frac{1}{6}$ c. $\frac{1}{3}$ d. $\frac{1}{2}$

Q.9. If the cost of 5 pens is Rs. 75 what is the cost of 8 pens?

a. Rs. 120 b. Rs. 130 c. Rs. 140 d. Rs. 150

Q. 10. What is the arithmetic mean of 3,2,6,3,2,1,0,7?

a. 2 b. 3 c. 4 d. 5

Q. 11. What is the product of $(\frac{5}{6})^3 \times (\frac{2}{3})^2$?

a. $\frac{500}{1944}$ b. $\frac{600}{864}$ c. $\frac{300}{1242}$ d. $\frac{900}{1234}$

Q.12. If x = 6 and y = 2 which is the value of $\frac{x^2 \Gamma y^2}{x \Gamma y}$?

a. 2 b. 3 c. 4 d. 5

Q.13. What is the formula of $a^3–b^3$?

a. $(a+b)^3–3ab\ (a+b)$ b. $(a–b)^3+3ab\ (a-b)$

c. $a^2+3a^2b+3ab^2+b^3$ d. $a^2+2ab+b^2$

Q.14. Which of the following formula is used to find perimeter of rectangle?

a. l+b b. 2(l+b) c. l×b d. l×b×h

Q. 15. Which of the following is the odd number?

a. 4 b. 5 c. 6 d. 8

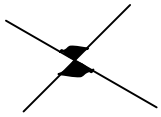
Q. 16. If a+b = 6 and ab = 7 then what is the value of a^3+b^3?

a. 70 b. 80 c. 90 d. 100

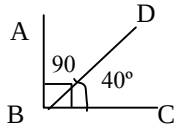
Q.17. Which angle is the coloured angle?

a. Vertically opposite angle b. adjacent angle

c. complementary angle d. Alternat angle

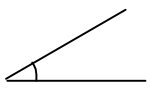


Q.18. If angle ABC = 90^0 and CBD = 40^0 then What is the value of ABD from the given figure?



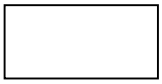
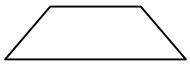
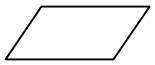
a. 30º b. 40º c. 50º d. 60º

Q.19 What is the measurement of angle?



a. 30º b. 100º c. 60º d. 150º

Q. 20. Which of the following figure has all sides are equal?

a.  b.  c.  d. 

Q.21. Which is the correct formula for the term a^2-b^2 ?

a. (a+b) (a-b) b.$(a+b)^2$ c. $(a-b)^2$ d. a^2-2ab+b^2

Q.22. What is the volume of the cuboid if l= 12cm, b= 8cm and h=5cm?

a. 270cm^3 b. 480cm^3 c. 670cm^3 d. 220cm^3

Q.23. How many faces are there in a Hexahedron?

a. 4 b. 5 c. 6 d. 7

Q.24. If we subtract 3a from 7a+3 the result is:

a. 2a+1 b. 3a+2 c. 4a+3 d.5a+4

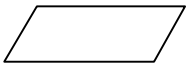
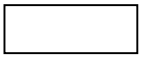
Q.25. If One side of a square is 4 cm, what is the area of a square?

a. 8cm^2 b. 10cm^2 c. 16cm^2 d. 20cm^2

Q.26. Which is solution of the equation –8x+4 = x–8?

. $\frac{2}{3}$ b. $\frac{5}{6}$ c. $\frac{4}{3}$ d. $\frac{8}{10}$

Q.27. Which figure is called a Parallelogram?

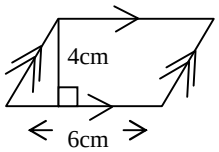
a.  b. 

c.  d. 

Q.28. What is the area of this quadrilateral?

a. 24cm^2 b. 25cm^2

c. 26cm^2 d. 27cm^2

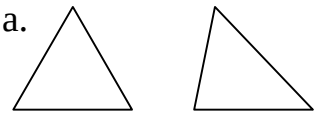
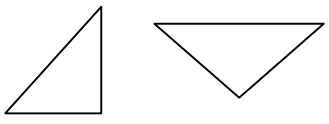


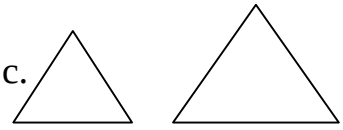
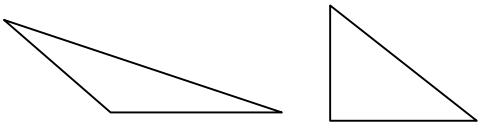
Q.29. In 4,265,321,264 commas (,) are given according to

a. national system b. International system

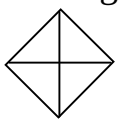
c. Roman system d. None of these

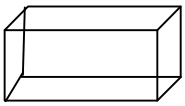
Q. 30. Which triangles are similar?

a.  b. 

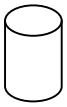
c.  d. 

Q. 31. Which figure is called tetrahedron?

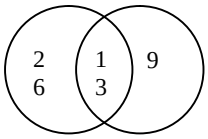
a. 

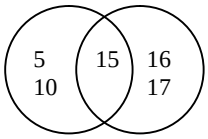
b. 

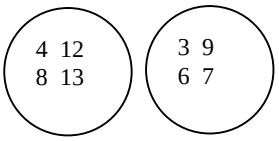
c. 

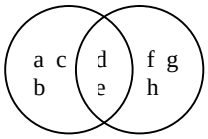
d. 

Q.32. Which set is called disjoint set?

a. 

b. 

c. 

d. 

Q. 33. Which is the correct statement?

a. +7 < -3 b. + 3 > +5 c. -5 > -7 d. +5 < -5

Q. 34. What is the value of (-12) ÷ (-4)

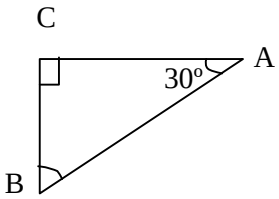
a. 2 b. 3 c. 4 d. 5

Q. 35. If 6 is added to a certain number, the result is 10, find the number.

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

Q. 36. What is the value of an angle ABC from Δ ABC

a. 30° b. 40°
c. 50° d. 60°



Q.37. Which of the following pair of angles is the complementary angles ?

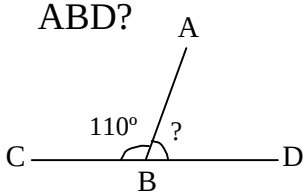
a. 30° and 60° b. 40° and 30°
c. 30° and 50° d. 50° and 10°

Q.38. What is 75% to a fraction?

a. $\frac{4}{5}$ b. $\frac{3}{5}$ c. $\frac{2}{3}$ d. $\frac{3}{4}$

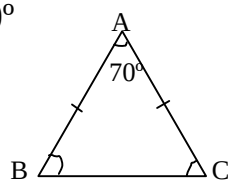
Q.39. If ABC = 110º in the given figure. What is ABD?

a. 45º b. 80º
c. 60º d. 70º



Q.40. If triangle ABC is an isosceles triangle and A = 70º what must be the C?

a. 50º b. 55º
c. 60º d. 65º



Appendix – III
Marks obtained by students taught by trained teachers.

Name of the students taught by trained teachers and their marks

S.N.	Name of the students	Marks	S.N.	Name of Students	Marks
1	Lila Bhandari	36	33	Ganga Lama	30
2	Pradip Thakuri	31	34	Ranjan Kunwar	29
3	Anish Paija	29	35	Amrita Thapa	21
4	Man maya Magar	25	36	Tashi Dhundrup Gurung	29
5	Sunita B.K.	23	37	Jamuna Lama	29
6	Manu Gurung	26	38	Sumitra Kunwar	32
7	Saroj Pun	27	39	Arati Poudel	30
8	Dilip Gurung	31	40	Amrita Adhikari	23
9	Mina Subedi	26	41	Alishiba Sharma	24
10	Ashmita G.C.	20	42	Arjun Subedi	28
11	Binu Gurung	30	43	Sharmila Poudel	26
12	Ajay Pariyar	23	44	Sundar Koirala	24
13	Aasha Adhikari	18	45	Rajendra Pariyar	27
14	Sharmila Nepali	22	46	Ganesh Subedi	30
15	Laxman Pariyar	26	47	Anju Adhikari	18
16	Bikal Parajuli	26	48	Sangita Pariyar	26
17	Dinesh Sunar	38	49	Sundar Bhandari	33
18	Balkrishna Poudel	36	50	Alisha Bhandari	34
19	Arjun Sunar	35	51	Puja Gurung	21
20	Santosh Pariyar	27	52	Laxmi Khadka	33
21	Sharmila Giri	23	53	Manu Nepali	17
22	Bishal B.K.	28	54	Madan Bhandari	30
23	Sangita B.K.	24	55	Anita Bhandari	23
24	Maya Nepali	33	56	Kamal B.K.	26
25	Amrit Sunar	30	57	Shiva Bhandari	26
26	Roshani Shrestha	31	58	Binita Bhandari	24
27	Srijana Nepali	14	59	Ritu Bhandari	23
28	Umesh Sunar	27	60	Sunita Bhandari	17
29	Devi Giri	20	61	Nabin Shrestha	32
30	Hari Kumari K.C.	28	62	Maya Gurung	31
31	Sabitri B.K.	16	63	Ashmita Gautam	26
32	Kalpana Poudel	24	64	Lila Devi Bhandari	18

Appendix – IV

Marks obtained by students taught by untrained teachers.

Name of the students taught by untrained teachers and their marks

S.N.	Name of the students	Marks	S.N.	Name of Students	Marks
1	Rohit Bhandari	30	33	Subash Sunar	36
2	Anu Gurung	27	34	Sagar Raj Baral	35
3	Alina Gurung	18	35	Atam Baral	27
4	Gita Lama	23	36	Sabina Sunar	32
5	Hari Bhujel	17	37	Sabita B.K.	32
6	Niru Chaudhari	24	38	Manish Karki	31
7	Amrita Thapa	20	39	Sujan Baral	35
8	Binjina Pariyar	18	40	Ramchandra B.K.	34
9	Anita Pariyar	29	41	Chunmaya B.K.	33
10	Suraj Gurung	26	42	Santosh Nepali	28
11	Soburna Gurung	29	43	Krishna Baral	28
12	Krishna Thapa	20	44	Hari Nepali	23
13	Anita Roka Magar	27	45	Sanjaya Baral	28
14	Yanmaya Gurung	17	46	Lila Kantha Baral	35
15	Purna Bahadur Thapa	14	47	Rita Baral	20
16	Kamal Karki	16	48	Rajan Baral	34
17	Lila Gurung	28	49	Chija B.K.	17
18	Bishwa Raj Lamichhane	33	50	Dhruba B.K.	14
19	Suraj Gurung	28	51	Priya Devkota	22
20	Sangita Thapa	25	52	Rita Devkota	19
21	Sadiksha Ale	28	53	Binod Devkota	22
22	Kalpana Acharya	26	54	Srijana B.K.	16
23	Shree Prasad Gurung	30	55	Sabita Sunar	17
24	Buddhi Raj Nepali	24	56	Bishal B.K.	25
25	Nista Gurung	20	57	Puspa Devkota	16
26	Arati Shah	28	58	Santosh B.K.	15
27	Hitman Gurung	29	59	Jyoti Devkota	15
28	Dambar Kumari Gurung	22	60	Buddhi Bahadur Pariyar	21
29	Chandra Kala Subedi	26	61	Kumar Devkota	16
30	Rajendra Gurung	27	62	Asari B.K.	15
31	Uttam Gurung	24	63	Gaumaya B.K.	15
32	Kiran B.K.	28	64	Kumar Rai	20

Appendix – V
Marks obtained by boys taught by trained and untrained teachers

Name of the boys taught by trained and untrained teachers and their marks

S.N.	Name of the Boys	Marks	S.N.	Name of Boys	Marks
1	Rohit Bhandari	30	31	Bishal B.K.	25
2	Hari Bhujel	17	32	Santosh B.K.	15
3	Amrit Thapa	20	33	Buddhi Bahadur Pariyar	21
4	Suraj Gurung	26	34	Kumar Devkota	16
5	Soburna Gurung	29	35	Kumar Rai	20
6	Krishna Thapa	20	36	Pradip Thakuri	31
7	Purna Bahadur Thapa	14	37	Anish Paija	29
8	Kamal Karki	16	38	Saroj Pun	27
9	Bishwa Raj Lamichhane	33	39	Dilip Gurung	31
10	Suraj Gurung	28	40	Ajay Pariyar	23
11	Shree Prasad Gurung	30	41	Laxman Pariyar	26
12	Buddhi Raj Nepali	24	42	Bikal Parajuli	26
13	Hitman Gurung	29	43	Dinesh Sunar	38
14	Rajendra Gurung	27	44	Balkrishna Poudel	36
15	Uttam Gurung	24	45	Arjun Sunar	35
16	Krishna B.K.	28	46	Santosh Pariyar	27
17	Subash Sunar	36	47	Bishal B.K.	28
18	Sagar Raj Baral	35	48	Amrit Sunar	30
19	Atam Baral	27	49	Umesh Sunar	27
20	Manish Karki	31	50	Rajan Kunwar	29
21	Sujan Baral	35	51	Tashi Dhundrup Gurung	29
22	Ramchandra B.K.	34	52	Arjun Subedi	28
23	Santosh Nepali	28	53	Sundar Koirala	24
24	Krishna Baral	28	54	Rajendra Pariyar	27
25	Hari Nepali	23	55	Ganesh Subedi	30
26	Sanjaya Baral	28	56	Sundar Bhandari	33
27	Lila Kantha Baral	35	57	Madan Bhandari	30
28	Rajan Baral	34	58	Kamal B.K.	26
29	Dhruba B.K.	14	59	Shiva Bhandari	26
30	Binod Devkota	22	60	Nabin Shrestha	32

Appendix - VI
Marks obtained by Girls taught by trained and untrained teachers

Name of the Girls taught by trained and untrained teachers and their marks

S.N.	Name of the Girls	Marks	S.N.	Name of Girls	Marks
1	Anu Gurung	27	35	Asmita G.C.	20
2	Alina Gurung	18	36	Binu Gurung	30
3	Gita Lama	23	37	Aasha Adhikari	18
4	Niru Chaudhari	24	38	Sharmila Nepali	22
5	Binjina Pariyar	18	39	Sharmila Giri	23
6	Anita Pariyar	29	40	Sangita B.K.	24
7	Anita Roka Magar	27	41	Maya Nepali	33
8	Yanmaya Gurung	17	42	Roshani Shrestha	31
9	Lila Gurung	28	43	Srijana Nepali	14
10	Sangita Thapa	25	44	Devi Giri	20
11	Sadiksha Ale	28	45	Hari Kumari K.C.	28
12	Kalpana Acharya	26	46	Sabitri B.K.	16
13	Nista Gurung	20	47	Kalpana Poudel	24
14	Arati Shah	28	48	Ganga Lama	30
15	Dambar Kumari Gurung	22	49	Amrita Thapa	21
16	Chandrakala Subedi	26	50	Jamuna Lama	29
17	Sabina Sunar	32	51	Sumitra Kunwar	32
18	Sabita B.K.	32	52	Arati Poudel	30
19	Chunmaya B.K.	33	53	Amrita Adhikari	23
20	Rita Baral	20	54	Alishiba Sharma	24
21	Chija B.K.	17	55	Sharmila Poudel	26
22	Priya Devkota	22	56	Anju Adhikari	18
23	Rita Devkota	19	57	Sangita Pariyar	26
24	Srijana B.K.	16	58	Alisha Bhandari	34
25	Babita Sunar	17	59	Puja Gurung	21
26	Puspa Devkota	16	60	Laxmi Khadka	33
27	Jyoti Devkota	15	61	Mana Nepali	17
28	Asari B.K.	15	62	Anita Bhandari	23
29	Gaumaya B.K.	15	63	Binita Bhandari	24
30	Lila Bhandari	36	64	Ritu Bhandari	23
31	Manmaya Magar	25	65	Sunita Bhandari	17
32	Sunita B.K.	23	66	Maya Gurung	31
33	Manu Gurung	26	67	Ashmita Gautam	26
34	Mina Subedi	26	68	Lila Devi Bhandari	18

Appendix - VII
Marks obtained by boys taught by trained teachers

Name of the boys taught by trained teachers and their marks

S.N.	Name of the Boys	Marks
1	Pradip Thakuri	31
2	Anish Paija	29
3	Saroj Pun	27
4	Dilip Gurung	31
5	Ajay Pariyar	23
6	Laxman Pariyar	26
7	Bikal Parajuli	26
8	Dinesh Sunar	38
9	Balkrishna Poudel	36
10	Arjun Sunar	35
11	Santosh Pariyar	27
12	Bishal B.K.	28
13	Amrit Sunar	30
14	Umesh Sunar	27
15	Rajan Kunwar	29
16	Tashi Dhundrup Gurung	29
17	Arjun Subedi	28
18	Sundar Koirala	24
19	Rajendra Pariyar	27
20	Ganesh Subedi	30
21	Ishwar Bhandari	33
22	Madan Bhandari	30
23	Kamal B.K.	26
24	Shiva Bhandari	26
25	Nabin Shrestha	32

Appendix - VIII
Marks obtained by boys taught by untrained teachers

Name of the boys taught by untrained teachers and their marks

S.N.	Name of the Boys	Marks
1	Rohit Bhandari	30
2	Hari Bhujel	17
3	Amrit Thapa	20
4	Suraj Gurung	26
5	Soburna Gurung	29
6	Krishna Thapa	20
7	Purna Bahadur Thapa	14
8	Kamal Karki	16
9	Bishwa Raj Lamichhane	33
10	Suraj Gurung	28
11	Shree Prasad Gurung	30
12	Buddhi Raj Nepali	24
13	Hitman Gurung	29
14	Rajendra Gurung	27
15	Uttam Gurung	24
16	Kiran B.K.	28
17	Subash Sunar	36
18	Sagar Raj Baral	35
19	Atam Baral	27
20	Manish Karki	31
21	Sujan Baral	35
22	Ramchandra B.K.	34
23	Santosh Nepali	28
24	Krishna Baral	28
25	Hari Nepali	23
26	Sanjay Baral	28
27	Lila Kantha Baral	35
28	Rajan Baral	34
29	Dhruba B.K.	14
30	Binod Devkota	22
31	Bishal B.K.	25
32	Santosh B.K.	15
33	Buddhi Bahadur Pariyar	21
34	Kumar Devkota	16
35	Kumar Rai	20

Appendix - IX
Marks obtained by Girls taught by trained teachers

Name of the Girls taught by trained teachers and their marks

S.N.	Name of the Girls	Marks	S.N.	Name of Girls	Marks
1	Lila Bhandari	36	21	Sumitra Kunwar	32
2	Manmaya Magar	25	22	Arati Poudel	30
3	Sunita B.K.	23	23	Amrita Adhikari	23
4	Manu Gurung	26	24	Alishiba Sharma	24
5	Mina Subedi	26	25	Sharmila Poudel	26
6	Ashmita G.C.	20	26	Anju Adhikari	18
7	Binu Gurung	30	27	Sangita Pariyar	26
8	Aasha Adhikari	18	28	Alisha Bhandari	34
9	Sharmila Nepali	22	29	Puja Gurung	21
10	Sharmila Giri	23	30	Laxmi Khadka	33
11	Sangita B.K.	24	31	Mana Nepali	17
12	Roshani Shrestha	31	32	Anita Bhandari	23
13	Srijana Nepali	14	33	Binita Bhandari	24
14	Devi Giri	20	34	Ritu Bhandari	23
15	Hari Kumari K.C.	28	35	Sunita Bhandari	17
16	Sabitri B.K.	16	36	Maya Gurung	31
17	Kalpana Poudel	24	37	Ashmita Gautam	26
18	Ganga Lama	30	38	Lila Devi Bhandari	18
19	Amrita Thapa	21	39	Maya Nepali	33
20	Jamuna Lama	29			

Appendix - X
Marks obtained by Girls taught by untrained teachers

Name of the Girls taught by untrained teachers and their marks

S.N.	Name of the Girls	Marks
1	Anu Gurung	27
2	Alina Gurung	18
3	Gita Lama	23
4	Niru Chaudhari	24
5	Binjina Pariyar	18
6	Anita Pariyar	29
7	Anita Roka Magar	27
8	Yanmaya Gurung	17
9	Lila Gurung	28
10	Sangita Thapa	25
11	Sadiksha Ale	28
12	Kalpana Acharya	26
13	Nista Gurung	20
14	Arati Shah	28
15	Dambar Kumari Gurung	22
16	Chandrakala Subedi	26
17	Sabina Sunar	32
18	Sabita B.K.	32
19	Chunmaya B.K.	33
20	Rita Baral	20
21	Chija B.K.	17
22	Priya Devkota	22
23	Rita Devkota	19
24	Srijana B.K.	16
25	Babita Sunar	17
26	Puspa Devkota	16
27	Jyoti Devkota	15
28	Asari B.K.	15
29	Gaumaya B.K.	15

Appendix - XI
Item Analysis chart of Mathematics Achievement Test

Q.N.	UR	LR	P-value (%)	D-value	Decision	Q.N.	UR	LR	P-value (%)	D-value	Decision
1	9	4	54.16	0.416	A	31	7	2	37.5	0.416	A
2	12	10	91.66	0.166	R	32	2	2	16.66	0	R
3	11	10	87.5	0.083	R	33	8	2	41.66	0.5	A
4	10	4	58.33	0.5	A	34	12	9	87.5	25	R
5	12	4	66.66	0.666	A	35	10	5	62.5	0.416	A
6	10	4	58.33	0.5	A	36	4	1	0.83	0.25	R
7	10	l5	62.5	0.41	A	37	12	7	79.16	0.416	R
8	12	7	79.16	0.41	R	38	7	3	41.66	0.33	A
9	11	5	66.66	0.5	A	39	10	7	62.5	0.416	A
10	4	1	20.83	0.25	R	40	5	3	33.33	0.166	R
11	8	3	45.83	0.416	A	41	10	4	58.33	0.5	A
12	8	2	41.66	0.5	A	42	10	6	66.66	0.33	A
13	10	6	66.66	0.33	A	43	1	1	8.33	0	R
14	3	0	12.5	0.25	R	44	8	7	62.5	0.083	R
15	8	4	50	0.33	A	45	4	1	20.83	0.5	R
16	9	3	50	0.5	A	46	9	4	54.16	0.416	A
17	8	2	41.66	0.5	A	47	8	1	37.5	0.583	A
18	12	8	83.33	0.33	R	48	7	5	50	0.166	R
19	8	3	45.83	0.416	A	49	9	3	50	0.5	A
20	9	2	45.83	0.583	A	50	4	1	20.83	0.25	R
21	11	4	62.5	0.583	A	51	3	5	33.33	]-0.166	R
22	9	5	58.33	0.33	A	52	7	3	41.66	0.38	A
23	4	3	29.16	0.083	R	53	10	5	62.5	0.416	A
24	9	4	54.16	0.41	A	54	5	2	29.16	0.25	R
25	10	3	54.16	0.58	A	55	10	4	50.33	0.5	A
26	8	4	50	0.33	A	56	12	4	66.66	0.666	A
27	9	5	58.33	0.33	A	57	10	2	50	0.66	A
28	3	5	33.33	-0.166	R	58	8	1	37.5	0.583	A
29	8	3	45.83	0.41	A	59	9	1	41.66	0.66	A
30	11	4	62.5	0.583	A	60	6	2	33.33	0.33	A

UR = Number of students who give right answer with 27 percent high score group

LR = Number of students who give right answer with 27 percent low score group

P = Difficulty level or power of index. D = Discriminations index.

A = Accepted R = Rejected

APPENDIX – XII

Specification Chart of Achievement Test

S.N.	Units	Level of Cognitive domain				Total
		K	S	C	A	
1.	Set	-	1	1	-	2
2.	Operation on Whole Number	2	2	1	-	5
3.	Operation on Integer	-	-	-	1	1
4.	Fraction and decimal	1	-	-	-	1
5.	Ratio, Proportion and Percentage	1	1	1	-	3
6.	Unitary Method	-	1	-	-	1
7.	Algebraic expression	2	2	2	1	7
8.	Equation and inequality	-	1	1	1	3
9.	Lines and angles	3	2	-	-	5
10.	Triangles and quadrilaterals	1	-	2	2	5
11.	Solids	1	-	1	-	2
12.	Area and volume	1	1	-	2	4
13.	Statistics	-	1	-	-	1
	Total	12	12	9	7	40
	Percentage	30%	30%	22.5%	17.5%	100%

Appendix – XIII

Spilt – Half Reliability Calculation Table

Students	Odd	Even	Sum	Difference
A	29	27	56 H	2
B	26	25	51 H	1 L
C	25	21	46 H	4 H
D	21	19	40 H	2
E	21	18	39 H	3
F	20	19	39 H	1 L
G	20	18	38	2
H	22	16	38	6 H
I	20	17	37	3
J	19	17	36	2
K	19	16	35	3
L	20	15	35	5 H
M	13	10	23	3
N	13	11	24	2
O	12	10	22	2
P	12	9	21	3
Q	11	10	21	1 L
R	10	9	19	1 L
S	10	8	18 L	2 L
T	11	6	17 L	5 H
U	10	7	17 L	3
V	10	6	16 L	4 H
W	8	7	15 L	1 L
X	10	5	15 L	5 H

APPENDIX - XIV

ANSWER KEY of ACHIECEMENT TEST

Item number	Answer	Item number	Answer
1	c	21	a
2	c	22	b
3	a	23	c
4	c	24	c
5	b	25	c
6	a	26	c
7	a	27	a
8	c	28	a
9	a	29	b
10	b	30	c
11	a	31	a
12	d	32	c
13	b	33	c
14	b	34	b
15	b	35	b
16	c	36	d
17	a	37	a
18	c	38	d
19	a	39	d
20	a	40	b

APPENDIX – XV

List of Schools taught by trained teacher

1. Dharmasthali Lower Secondary School, Pokhara-5, Kaski
2. Shree Dharapani Secondary School, Dhikurpokhari-5, Kaski
3. Bindhyawasini Higher Secondary School, Pokhara-2, Kaski
4. Shree Udaya Secondary School, Dhampus-5, Kaski

List of School taught by untrained teachers

1. Maheswari Lower Secondary School, Pumdi Bhumdi-3, Kaski
2. Bhadrakali Higher Secondary School, Pokhara-15, Kaski
3. Shree Siddha Secondary School, Pokhara-15, Kaski
4. Sangam Secondary School, Lumle-4, Kaski

APPENDIX – XVI

Raw Scores of Sample Students

Schools taught by trained teachers

Dharmasthali Lower Secondary School, Pokhara-5, Kaski

Boys	Girls
29, 29, 28, 24, 27, 30	30, 21, 29, 32, 30, 23, 24, 26, 18, 26

Dharapani Secondary School, Dhikurpokhari-5, Kaski

Boys	Girls
38, 36, 35, 27, 28, 30, 27	23, 24, 31, 14, 20, 28, 16, 24, 33

Bindhyawasini Higher Secondary School, Pokhara-2, Kaski

Boys	Girls
31, 29, 27, 31, 23, 26, 26	36, 25, 23, 26, 26, 20, 30, 18, 22

Udaya Secondary School, Dhampus-5, Kaski

Boys	Girls
33, 30, 26, 26, 32	34, 21, 33, 17, 23, 24, 23, 17, 31, 26, 18

School taught by untrained teachers

Maheswari Lower Secondary School, Pumdi-Bhumdi-3, Kaski

Boys	Girls
36, 35, 27, 31, 35, 34, 28, 28, 23, 28, 35, 34	32, 32, 33, 20

Bhadrakali Higher Secondary School, Pokhara-15, Kaski

Boys	Girls
33, 28, 30, 24, 29, 27, 24, 28	28, 25, 28, 26, 20, 28, 22, 26

Shree Siddha Secondary School, Pokhara-15, Kaski

Boys	Girls
30, 17, 20, 26, 29, 20, 14, 16	27, 18, 23, 24, 18, 29, 27, 17

Sangam Secondary School, Lumle-4, Kaski

Boys	Girls
14, 22, 25, 15, 21, 16, 20	17, 22, 19, 16, 17, 16, 15, 15, 15

APPENDIX – XVII

Statistical Formulae Used in the Analysis

1) Reliability coefficient – $r_{tt} = 1 - \frac{D_d^2}{D^2_s}$

2) Level of Difficulty P = $\frac{U_R - L_R}{T} \times 100\%$

3) Power of Discrimination D = $\frac{U_R - L_R}{\frac{T}{2}}$

4) Mean $\bar{x} = \frac{\phi fx}{N}$

5) Standard Deviation (s) = $\sqrt{\frac{\phi(x - \bar{x})^2}{N - 1}}$

Where, s=$\hat{\sigma}$ is an unbiased estimate population of standard deviation.

6) t = $\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$

7) Degree of freedom = N_1+N_2-2

8) z = $\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\hat{\sigma}_1^2}{N_1} + \frac{\hat{\sigma}_2^2}{N_2}}}$

Where, $\hat{\sigma}_1^2 = s_1^2$ and $\hat{\sigma}_2^2 = s_2^2$, $\hat{\sigma}_1^2$ is variance of 1st group and $\hat{\sigma}_2^2$ is Variance of 2nd group.

:बचपक यदतबष्लभम दथ कतगमभलतक तबगनजत दथ तचबष्लभम तभबअजभचक।

ल्कभ या तजभ कतगमभलतक तबगनजत दथ तचबष्लभम तभबअजभचक बलम तजभष्च ुबचपक

S.N.	Name of the students	Marks	S.N.	Name of Students	Marks
1	Lila Bhandari	36	33	Ganga Lama	30
2	Pradip Thakuri	31	34	Ranjan Kunwar	29
3	Anish Paija	29	35	Amrita Thapa	21
4	Man maya Magar	25	36	Tashi Dhundrup Gurung	29
5	Sunita B.K.	23	37	Jamuna Lama	29
6	Manu Gurung	26	38	Sumitra Kunwar	32
7	Saroj Pun	27	39	Arati Poudel	30
8	Dilip Gurung	31	40	Amrita Adhikari	23
9	Mina Subedi	26	41	Alishiba Sharma	24
10	Ashmita G.C.	20	42	Arjun Subedi	28
11	Binu Gurung	30	43	Sharmila Poudel	26
12	Ajay Pariyar	23	44	Sundar Koirala	24
13	Aasha Adhikari	18	45	Rajendra Pariyar	27
14	Sharmila Nepali	22	46	Ganesh Subedi	30
15	Laxman Pariyar	26	47	Anju Adhikari	18
16	Bikal Parajuli	26	48	Sangita Pariyar	26
17	Dinesh Sunar	38	49	Sundar Bhandari	33
18	Balkrishna Poudel	36	50	Alisha Bhandari	34
19	Arjun Sunar	35	51	Puja Gurung	21
20	Santosh Pariyar	27	52	Laxmi Khadka	33
21	Sharmila Giri	23	53	Manu Nepali	17
22	Bishal B.K.	28	54	Madan Bhandari	30
23	Sangita B.K.	24	55	Anita Bhandari	23
24	Maya Nepali	33	56	Kamal B.K.	26
25	Amrit Sunar	30	57	Shiva Bhandari	26
26	Roshani Shrestha	31	58	Binita Bhandari	24
27	Srijana Nepali	14	59	Ritu Bhandari	23
28	Umesh Sunar	27	60	Sunita Bhandari	17
29	Devi Giri	20	61	Nabin Shrestha	32
30	Hari Kumari K.C.	28	62	Maya Gurung	31

31	Sabitri B.K.	16	63	Ashmita Gautam	26
32	Kalpana Poudel	24	64	Lila Devi Bhandari	18

:बचपक यदतबष्लभम दथ कतगमभलतक तबगनजत दथ गलतचबष्लभम तभबअजभचक।

ल्कभ या तजभ कतगमभलतक तबगनजत दथ गलतचबष्लभम तभबअजभचक बलम तजभष्च ुबचपक

S.N.	Name of the students	Marks	S.N.	Name of Students	Marks
1	Rohit Bhandari	30	33	Subash Sunar	36
2	Anu Gurung	27	34	Sagar Raj Baral	35
3	Alina Gurung	18	35	Atam Baral	27
4	Gita Lama	23	36	Sabina Sunar	32
5	Hari Bhujel	17	37	Sabita B.K.	32
6	Niru Chaudhari	24	38	Manish Karki	31
7	Amrita Thapa	20	39	Sujan Baral	35
8	Binjina Pariyar	18	40	Ramchandra B.K.	34
9	Anita Pariyar	29	41	Chunmaya B.K.	33
10	Suraj Gurung	26	42	Santosh Nepali	28
11	Soburna Gurung	29	43	Krishna Baral	28
12	Krishna Thapa	20	44	Hari Nepali	23
13	Anita Roka Magar	27	45	Sanjaya Baral	28
14	Yanmaya Gurung	17	46	Lila Kantha Baral	35
15	Purna Bahadur Thapa	14	47	Rita Baral	20
16	Kamal Karki	16	48	Rajan Baral	34
17	Lila Gurung	28	49	Chija B.K.	17
18	Bishwa Raj Lamichhane	33	50	Dhruba B.K.	14
19	Suraj Gurung	28	51	Priya Devkota	22
20	Sangita Thapa	25	52	Rita Devkota	19
21	Sadiksha Ale	28	53	Binod Devkota	22
22	Kalpana Acharya	26	54	Srijana B.K.	16
23	Shree Prasad Gurung	30	55	Sabita Sunar	17
24	Buddhi Raj Nepali	24	56	Bishal B.K.	25
25	Nista Gurung	20	57	Puspa Devkota	16
26	Arati Shah	28	58	Santosh B.K.	15
27	Hitman Gurung	29	59	Jyoti Devkota	15
28	Dambar Kumari Gurung	22	60	Buddhi Bahadur Pariyar	21
29	Chandra Kala Subedi	26	61	Kumar Devkota	16
30	Rajendra Gurung	27	62	Asari B.K.	15

31	Uttam Gurung	24	63	Gaumaya B.K.	15
32	Kiran B.K.	28	64	Kumar Rai	20

:बचपक यदतबष्लभम दथ दयथक तबगनजत
दथ तचबष्लभम बलम गलतचबष्लभम तभबअजभचक

ल्कभ या तजभ दयथक तबगनजत दथ तचबष्लभम बलम गलतचबष्लभम तभबअजभचक
बलम तजभष्च ुबचपक

S.N.	Name of the Boys	Marks	S.N.	Name of Boys	Marks
1	Rohit Bhandari	30	31	Bishal B.K.	25
2	Hari Bhujel	17	32	Santosh B.K.	15
3	Amrit Thapa	20	33	Buddhi Bahadur Pariyar	21
4	Suraj Gurung	26	34	Kumar Devkota	16
5	Soburna Gurung	29	35	Kumar Rai	20
6	Krishna Thapa	20	36	Pradip Thakuri	31
7	Purna Bahadur Thapa	14	37	Anish Paija	29
8	Kamal Karki	16	38	Saroj Pun	27
9	Bishwa Raj Lamichhane	33	39	Dilip Gurung	31
10	Suraj Gurung	28	40	Ajay Pariyar	23
11	Shree Prasad Gurung	30	41	Laxman Pariyar	26
12	Buddhi Raj Nepali	24	42	Bikal Parajuli	26
13	Hitman Gurung	29	43	Dinesh Sunar	38
14	Rajendra Gurung	27	44	Balkrishna Poudel	36
15	Uttam Gurung	24	45	Arjun Sunar	35
16	Krishna B.K.	28	46	Santosh Pariyar	27
17	Subash Sunar	36	47	Bishal B.K.	28
18	Sagar Raj Baral	35	48	Amrit Sunar	30
19	Atam Baral	27	49	Umesh Sunar	27
20	Manish Karki	31	50	Rajan Kunwar	29
21	Sujan Baral	35	51	Tashi Dhundrup Gurung	29
22	Ramchandra B.K.	34	52	Arjun Subedi	28
23	Santosh Nepali	28	53	Sundar Koirala	24
24	Krishna Baral	28	54	Rajendra Pariyar	27
25	Hari Nepali	23	55	Ganesh Subedi	30
26	Sanjaya Baral	28	56	Sundar Bhandari	33
27	Lila Kantha Baral	35	57	Madan Bhandari	30
28	Rajan Baral	34	58	Kamal B.K.	26
29	Dhruba B.K.	14	59	Shiva Bhandari	26
30	Binod Devkota	22	60	Nabin Shrestha	32

:बचपक यदतबष्लभम दथ न्ष्चकि तबगनजत दथ तचबष्लभम बलम गलतचबष्लभम तभबअजभचक

ल्कभ या तजभ न्ष्चकि तबगनजत दथ तचबष्लभम बलम गलतचबष्लभम तभबअजभचक बलम तजभष्च ्बचपक

S.N.	Name of the Girls	Marks	S.N.	Name of Girls	Marks
1	Anu Gurung	27	35	Asmita G.C.	20
2	Alina Gurung	18	36	Binu Gurung	30
3	Gita Lama	23	37	Aasha Adhikari	18
4	Niru Chaudhari	24	38	Sharmila Nepali	22
5	Binjina Pariyar	18	39	Sharmila Giri	23
6	Anita Pariyar	29	40	Sangita B.K.	24
7	Anita Roka Magar	27	41	Maya Nepali	33
8	Yanmaya Gurung	17	42	Roshani Shrestha	31
9	Lila Gurung	28	43	Srijana Nepali	14
10	Sangita Thapa	25	44	Devi Giri	20
11	Sadiksha Ale	28	45	Hari Kumari K.C.	28
12	Kalpana Acharya	26	46	Sabitri B.K.	16
13	Nista Gurung	20	47	Kalpana Poudel	24
14	Arati Shah	28	48	Ganga Lama	30
15	Dambar Kumari Gurung	22	49	Amrita Thapa	21
16	Chandrakala Subedi	26	50	Jamuna Lama	29
17	Sabina Sunar	32	51	Sumitra Kunwar	32
18	Sabita B.K.	32	52	Arati Poudel	30
19	Chunmaya B.K.	33	53	Amrita Adhikari	23
20	Rita Baral	20	54	Alishiba Sharma	24
21	Chija B.K.	17	55	Sharmila Poudel	26
22	Priya Devkota	22	56	Anju Adhikari	18
23	Rita Devkota	19	57	Sangita Pariyar	26
24	Srijana B.K.	16	58	Alisha Bhandari	34
25	Babita Sunar	17	59	Puja Gurung	21
26	Puspa Devkota	16	60	Laxmi Khadka	33
27	Jyoti Devkota	15	61	Mana Nepali	17
28	Asari B.K.	15	62	Anita Bhandari	23
29	Gaumaya B.K.	15	63	Binita Bhandari	24
30	Lila Bhandari	36	64	Ritu Bhandari	23
31	Manmaya Magar	25	65	Sunita Bhandari	17
32	Sunita B.K.	23	66	Maya Gurung	31

33	Manu Gurung	26	67	Ashmita Gautam	26
34	Mina Subedi	26	68	Lila Devi Bhandari	18

:बचपक यदतबष्लभम दथ दयथक तबगनजत दथ तचबष्लभम तभबअजभचक

ल्कभ या तजभ दयथक तबगनजत दथ तचबष्लभम तभबअजभचक बलम तजभष्च ्बचपक

S.N.	Name of the Boys	Marks
1	Pradip Thakuri	31
2	Anish Paija	25
3	Saroj Pun	27
4	Dilip Gurung	31
5	Ajay Pariyar	23
6	Laxman Pariyar	26
7	Bikal Parajuli	26
8	Dinesh Sunar	38
9	Balkrishna Poudel	36
10	Arjun Sunar	35
11	Santosh Pariyar	27
12	Bishal B.K.	28
13	Amrit Sunar	30
14	Umesh Sunar	27
15	Rajan Kunwar	29
16	Tashi Dhundrup Gurung	29
17	Arjun Subedi	28
18	Sundar Koirala	24
19	Rajendra Pariyar	27
20	Ganesh Subedi	30
21	Sundar Bhandari	33
22	Madan Bhandari	30
23	Kamal B.K.	26
24	Shiva Bhandari	26
25	Nabin Shrestha	32

:बचपक यदतबष्लभम दथ दयथक तबगनजत दथ गलतचबष्लभम तभबअजभचक

ल्कभ या तजभ दयथक तबगनजत दथ गलतचबष्लभम तभबअजभचक बलम तजभष्च ुबचपक

S.N.	Name of the Boys	Marks
1	Rohit Bhandari	30
2	Hari Bhujel	17
3	Amrit Thapa	20
4	Suraj Gurung	26
5	Soburna Gurung	29
6	Krishna Thapa	20
7	Purna Bahadur Thapa	14
8	Kamal Karki	16
9	Bishwa Raj Lamichhane	33
10	Suraj Gurung	28
11	Shree Prasad Gurung	30
12	Buddhi Raj Nepali	24
13	Hitman Gurung	29
14	Rajendra Gurung	27
15	Uttam Gurung	24
16	Kiran B.K.	28
17	Subash Sunar	36
18	Sagar Raj Baral	35
19	Atam Baral	27
20	Manish Karki	31
21	Sujan Baral	35
22	Ramchandra B.K.	34
23	Santosh Nepali	28
24	Krishna Baral	28
25	Hari Nepali	23
26	Sanjay Baral	28
27	Lila Kantha Baral	35
28	Rajan Baral	34
29	Dhruba B.K.	14
30	Binod Devkota	22
31	Bishal B.K.	25
32	Santosh B.K.	15

33	Buddhi Bahadur Pariyar	21
34	Kumar Devkota	16
35	Kumar Rai	20

:बचपक यदतबष्लभम दथ न्ष्चकि तबगनजत दथ तचबष्लभम तभबअजभचक

ल्कभ या तजभ न्ष्चकि तबगनजत दथ तचबष्लभम तभबअजभचक बलम तजभष्च ्बचपक

S.N.	Name of the Girls	Marks	S.N.	Name of Girls	Marks
1	Lila Bhandari	36	21	Sumitra Kunwar	32
2	Manmaya Magar	25	22	Arati Poudel	30
3	Sunita B.K.	23	23	Amrita Adhikari	23
4	Manu Gurung	26	24	Alishiba Sharma	24
5	Mina Subedi	26	25	Sharmila Poudel	26
6	Ashmita G.C.	20	26	Anju Adhikari	18
7	Binu Gurung	30	27	Sangita Pariyar	26
8	Aasha Adhikari	18	28	Alisha Bhandari	34
9	Sharmila Nepali	22	29	Puja Gurung	21
10	Sharmila Giri	23	30	Laxmi Khadka	33
11	Sangita B.K.	24	31	Mana Nepali	17
12	Roshani Shrestha	31	32	Anita Bhandari	23
13	Srijana Nepali	14	33	Binita Bhandari	24
14	Devi Giri	20	34	Ritu Bhandari	23
15	Hari Kumari K.C.	28	35	Sunita Bhandari	17
16	Sabitri B.K.	16	36	Maya Gurung	31
17	Kalpana Poudel	24	37	Ashmita Gautam	26
18	Ganga Lama	30	38	Lila Devi Bhandari	18
19	Amrita Thapa	21	39	Maya Nepali	33
20	Jamuna Lama	29			

:बचपक यदतबष्लभम दथ न्ष्चकि तबगनजत दथ गलतचबष्लभम तभबअजभचक

ल्कभ या तजभ न्ष्चकि तबगनजत दथ गलतचबष्लभम तभबअजभचक बलम तजभष्च
ऋबचपक

S.N.	Name of the Girls	Marks
1	Anu Gurung	27
2	Alina Gurung	18
3	Gita Lama	23
4	Niru Chaudhari	24
5	Binjina Pariyar	18
6	Anita Pariyar	29
7	Anita Roka Magar	27
8	Yanmaya Gurung	17
9	Lila Gurung	28
10	Sangita Thapa	25
11	Sadiksha Ale	28
12	Kalpana Acharya	26
13	Nista Gurung	20
14	Arati Shah	28
15	Dambar Kumari Gurung	22
16	Chandrakala Subedi	26
17	Sabina Sunar	32
18	Sabita B.K.	32
19	Chunmaya B.K.	33
20	Rita Baral	20
21	Chija B.K.	17
22	Priya Devkota	22
23	Rita Devkota	19
24	Srijana B.K.	16
25	Babita Sunar	17
26	Puspa Devkota	16
27	Jyoti Devkota	15
28	Asari B.K.	15
29	Gaumaya B.K.	15

Achievement test exam

Class: 7 F.M. : 60
Subject: Maths P.M. : 19.5

Name of the School:
Name of the Student:

Among the four answers given to each of the following questions only one is correct. Read the question carefully and put the tick mark (√) against the letter (a, b, c or d) which you think is correct.

Example:
which of the following number is square root of 16?
a. 2 b. 8 c. 4 d. 12

Questions:

Q.1. If A= {a, b, c, d, e} and B= {d, e, f, g, h}. Find A B
a. {a, b} b. {c, d} c. {d, e} d. {g, h}

Q.2. Which of the following is the square of 22?
a. 144 b. 256 c. 484 d. 444

Q.3. Which of the following is square root of 625?
a. 25 b. 21 c. 18 d. 16

Q.4. What is the product of $2\sqrt{2} \times 3\sqrt{2}$?
a. 25 b. 10 c. 12 d. 16

Q.5. Which of the following is the lowest common multiple (L.C.M.) of 24 and 48?
a. 21 b. 48 c. 28 d. 34

Q.6. What is $4\frac{1}{7}$ as decimal?
a. 4.1428 b. 3.821 c. 0.222 d. 5.232

Q.7. What is 12.5 in percent?
a. 1250% b. 35% c. 120% d. 212%

Q.8. Which of the following is $\frac{26}{78}$ ratio in its lowest term?
a. $\frac{1}{5}$ b. $\frac{1}{6}$ c. $\frac{1}{3}$ d. $\frac{1}{2}$

Q.9. If the cost of 5 pens is Rs. 75 what is the cost of 8 pens?

a. Rs. 120 b. Rs. 130 c. Rs. 140 d. Rs. 150

Q. 10. What is the arithmetic mean of 3,2,6,3,2,1,0,7?

a. 2 b. 3 c. 4 d. 5

Q. 11. What is the product of $(\frac{5}{6})^3 \times (\frac{2}{3})^2$?

a. $\frac{500}{1944}$ b. $\frac{600}{864}$ c. $\frac{300}{1242}$ d. $\frac{900}{1234}$

Q.12. If x = 6 and y = 2 which is the value of $\frac{x^2 \Gamma y^2}{x \Gamma y}$?

a. 2 b. 3 c. 4 d. 5

Q.13. What is the formula of $a^3 – b^3$?

a. $(a+b)^3 – 3ab\ (a+b)$ b. $(a–b)^3+3ab\ (a-b)$

c. $a^2+3a^2b+3ab^2+b^3$ d. $a^2+2ab+b^2$

Q.14. Which of the following formula is to find perimeter of rectangle?

a. l+b b. 2(l+b) c. l×b d. l×b×h

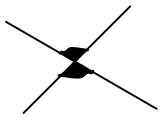
Q. 15. Which of the following is the odd number?

a. 4 b. 5 c. 6 d. 8

Q. 16. If a+b = 6 and ab = 7 then what is the value of a^3+b^3?

a. 70 b. 80 c. 90 d. 100

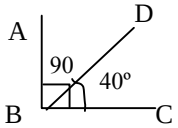
Q.17. Which angle is the coloured angle?



a. Vertically opposite angle b. adjacent angle

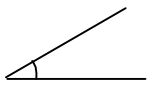
c. complementary angle d. Alternat angle

Q.18. If angle ABC = 90^0 and CBD = 40^0 then What is the value of ABD from the given figure?



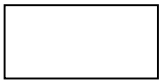
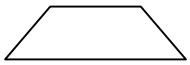
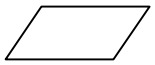
a. 30º b. 40º c. 50º d. 60º

Q.19 What is the measurement of angle?



a. 30º b. 100º c. 60º d. 150º

Q. 20. In Which figure of the following has all sides are equal?

a.  b.  c.  d. 

Q.21. Which is the correct formula for the term a^2-b^2 ?

a. (a+b) (a-b) b.$(a+b)^2$ c. $(a-b)^2$ d. $a^2-2ab+b^2$

Q.22. What is the volume of the cuboid if l= 12cm, b= 8cm and h=5cm?

a. $270cm^3$ b. $480cm^3$ c. $670cm^3$ d. $220cm^3$

Q.23. How many faces are there in a Hexahedron?

a. 4 b. 5 c. 6 d. 7

Q.24. If we subtract 3a from 7a+3 the result is:

a. 2a+1 b. 3a+2 c. 4a+3 d.5a+4

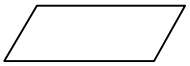
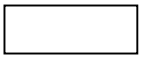
Q.25. If One side of a square is 4 cm, what is the area of a square?

a. $8cm^2$ b. $10cm^2$ c. $16cm^2$ d. $20cm^2$

Q.26. Which is solution of the equation –8x+4 = x–8?

. $\frac{2}{3}$ b. $\frac{5}{6}$ c. $\frac{4}{3}$ d. $\frac{8}{10}$

Q.27. Which figure is called a Parallelogram?

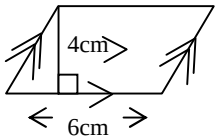
a.  b. 

c.  d. 

Q.28. What is the area of this quadrilateral?

a. $24cm^2$ b. $25cm^2$

c. $26cm^2$ d. $27cm^2$

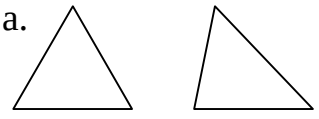
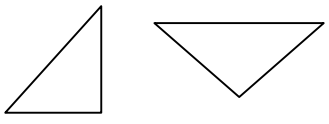


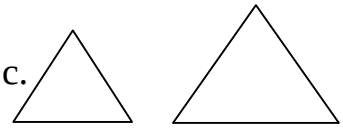
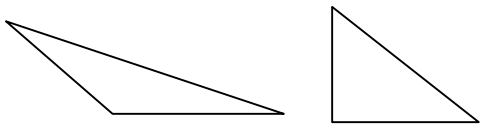
Q.29. In 4,265,321,264 has given commas according to

a. national system b. International system

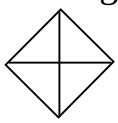
c. Roman system d. Non of these

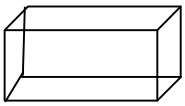
Q. 30. Which triangles are similar?

a.  b. 

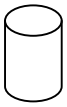
c.  d. 

Q. 31. Which figure is called tetrahedron?

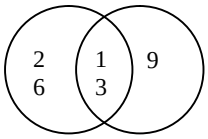
a. 

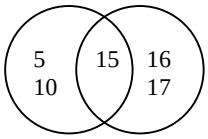
b. 

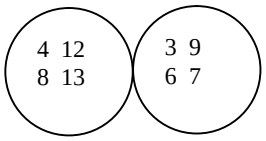
c. 

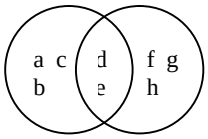
d. 

Q.32. Which set is called disjoint set?

a. 

b. 

c. 

d. 

Q. 33. Which is the correct statement?

a. +7 < -3 b. + 3 > +5 c. -5 > -7 d. +5 < -5

Q. 34. What is the value of (-12) ÷ (-4)

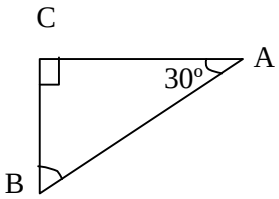
a. 2 b. 3 c. 4 d. 5

Q. 35. If 6 is added to a certain number, the result is 10, find the number.

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

Q. 36. What is the value of an angle ABC from Δ ABC

a. 30° b. 40°
c. 50° d. 60°



Q.37. Which of the following pair of angles is the complementary angles ?

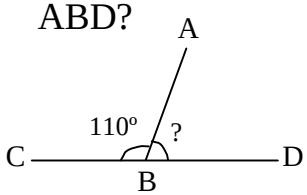
a. 30° and 60° b. 40° and 30°
c. 30° and 50° d. 50° and 10°

Q.38. What is 75% to a fraction?

a. $\frac{4}{5}$ b. $\frac{3}{5}$ c. $\frac{2}{3}$ d. $\frac{3}{4}$

Q.39. If ABC = 110º in the given figure. What is ABD?

a. 45º b. 80º
c. 60º d. 70º



Q.40. If triangle ABC is an isosceles triangle and A = 70º what must be the C?

a. 50º b. 55º
c. 60º d. 65º