# SET-1

Class: 10 F. M.: 75
Subject: C. Math Time: 3 hrs

***Attempt all the questions.***

**1. In a survey regarding the preference of Newari food and Thakali food, it has found that 70% like Newari food, 60% like Thakali food, 20% like none of these types of foods and 550 people like both types of foods.**

(a) If N and T denote the sets of people who like Newari food and Thakali food respectively, what does the cardinality notation $n(\overline{N \cup T})$ stand for? (1)

(b) Present the given information in a Venn-diagram. (1)

(c) Find the number of people who don't like both types of foods. (3)

(d) Compare the number of people who like Newari food only and the number of people who like Thakali food only. (1)

**2. Arjun borrowed Rs 4,00,000 from a commercial bank at the rate of 8% p.a. compounded semi-annually for 2 years. After one year, the bank changed its policy to pay the interest compounded quarterly at the same rate.**

(a) Write the formula to find the annual compound interest. (1)

(b) How much interest should he have to pay in the first year? Find it. (2)

(c) How much less interest would he have to pay if the bank had charged interest compounded annually for 2 years? (2)

**3. The present population of a municipality is 50,000. It is estimated that the population of the municipality increases by 4% and 5% respectively in next 2 years.**

(a) If the population growth rate of the municipality for the first year and the second year are $R_1$ % and $R_2$% respectively, write the formula to find the population after 2 years. (1)

(b) What will be the population of the municipality after two years? (1)

(c) If the population of the municipality increases at the rate of 5% per annum during the 2 years, by how many would the population of the municipality be more or less? (2)

**4. The exchange rate of Australian Dollar determined by Nepal Rastra Bank for Dec 29, 2025 is as follows.**

Buying rate: 1 AUD ($) = NPR 96.35; Selling rate: 1 AUD ($) = NPR 96.75

Urmila is going to Australia for higher study and she exchanged some AUD ($) with NPR 4,83,750 on Dec 29, 2025.

(a) At which rate did she exchange her money into AUD ($)? (1)

(b) How many Australian Dollars ($) did she get? (1)

(c) If Urmila cancelled her study plan to Australia due to her health issue and exchanged the Australian Dollars that she had into Nepali rupees when Nepali currency was devaluated by 2% in comparison with AUD ($), how much profit or loss would she have made in this transaction. (2)

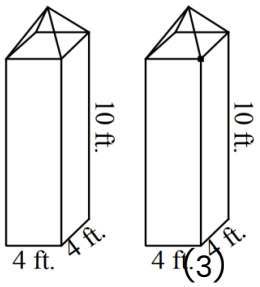
**5. A farmer stored a heap of wheat in the shape of a right circular cone. The diameter of the base is 7 m and the height is 1.2 m.**

(a) Write the formula for finding the volume of cone when its length of radius '*r*' and vertical height '*h*' are known. (1)

(b) Calculate the volume of the heap of wheat. (1)

(c) How much canvas is required to cover the heap to be protected from rain? Find it. (2)

**6. The gate of a school has two pillars; each of height is 10 ft. with four visible lateral faces and 4 ft. × 4 ft. bases. The top of each pillar has a combined pyramid of height 1.5 ft.**




(a) How many faces are visible in each combined structure? (1)

(b) Find the area of visible surfaces of both the structures. (3)

(c) If the cost of painting the combined structures of both pillars and pyramids is Rs 18,000; find the rate of painting. (1)

**7. A room is 6 m long, 5 m wide and 4 m high. There are 2 square windows of edge 1.5 m and a door of size 1 m × 3 m in the room.**

(a) Find the cost of painting the four walls and ceiling of the room excluding door and windows at the rate of Rs. 50 per square meter? (2)

(b) If the room had only one window and a door of size as mentioned in the context and the rate of painting was increased by one third of what it was before due to the increase in the market price, how much would be the total cost of painting the walls and ceiling of the room excluding door and window? Find it. (2)

**8.** **The table given below represents the number of jackets and hoodies sold in a Fancy Store during winter season.**

| Day | 1st | 2nd | 3rd | 4th | ... |
|---|---|---|---|---|---|
| No. of jackets | 3 | 6 | 12 | 24 | ... |
| No. of hoodies | 2 | 5 | 8 | 11 | ... |

(a) Write the formula for finding the geometric mean between two numbers 'a' and 'b'. (1)

(b) How many jackets are sold by the $7^{th}$ day? Find it. (2)

(c) Compare the total number of jackets and hoodies sold by the $7^{th}$ day. (2)

**9.** **In a rectangular field, the longer side is 5 m more than the shorter side and its area is 500 m².**

(a) Write the standard form of quadratic equation in $x$. (1)

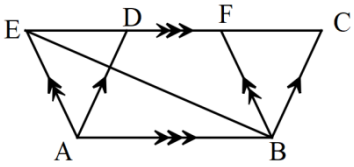
(b) Find the length and the breadth of the field. (3)

(c) Out of length or breadth, which one is to be decreased to make it a square and by what percent? (1)

**10.** (a) If $\frac{a}{x+3} + \frac{3}{x-1} = \frac{5x+7}{x^2+2x-3}$, find the value of $a$. (2)

(b) Prove that the value of $x$ obtained by solving the exponential equation $7^x + \frac{343}{7^x} = 56$ also satisfy the equation $3^{x-1} + 3^{2-x} = 4$. (3)

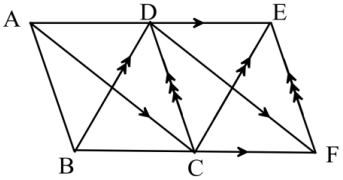
**11.** **In the figure, AD // BC, AE // BF and EC // AB.**




(a) Write the name of a parallelogram which is equal to the area of parallelogram ABCD. (1)

(b) Prove that area of $\Delta EAB$ is half of the area of $\square ABCD$. (2)

(c) In the figure, AE // BF, CD // FE, BD // CE and AC // DF. Prove that: AB // DC. (2)




**12.** **In a quadrilateral PQRS in which PQ = QR = 5 cm, RS = SP = 4 cm, and ∠PQR = 60°.**

(a) Construct the quadrilateral PQRS then construct a triangle PQT whose area is equal to the area of the quadrilateral. (3)

(b) Write the relation between the area of quadrilateral PQRS and triangle PQT with reason. (1)

**13. WXYZ is a cyclic quadrilateral.**

(a) Write the relation between ∠WXY and ∠WZY. (1)

(b) Verify experimentally that the relationship between ∠XYZ and ∠XWZ. (Two circles having radii at least 3 cm are necessary.) (2)

(c) If WXYZ is a parallelogram, find the value of ∠XYZ. (1)

**14. A 5 ft. tall boy is flying a kite. The length of string of the kite is $100\sqrt{3}$ m and the height of the kite from the ground is 155 ft.**

(a) Define angle of elevation. (1)

(b) Sketch a figure according to the given context. (1)

(c) Find the angle made by the string of the kite with the horizon. (1)

(d) If the angle made by the string of the kite with horizon is 45°, by how much more or less string is required to have the same height of the kite from the ground? (1)

**15. The marks obtained by the students in an examination are as follows.**

| Age (in years) | 0 – 10 | 10 – 20 | 20 - 30 | 30 - 40 | 40 – 50 |
|---|---|---|---|---|---|
| No. of people | 4 | 12 | $x$ | 9 | 5 |

(a) If the median of this data is 24, identify the median class. (1)

(b) Calculate the value of $x$. (2)

(c) Find the mean. (2)

(d) Compare the number of people of median and modal classes. (1)

**16. From a class having 24 boys and 16 girls, two students are selected randomly for class captain and vice-captain without sending the first student back to the class.**

(a) Define mutually exclusive events. (1)

(b) Show the probabilities of possible outcomes of selecting boys and girls in a tree diagram. (2)

(c) Find the probability of selecting both girls. (1)

(d) Compare the probability of selecting the students of same sex and different sex. (1)

**Best of Luck**

# SET-2

| | |
|---|---|
| Class: 10 | F. M.: 75 |
| Subject: C. Math | Time: 3 hrs |

***Attempt all the questions.***

**1. In a survey conducted among in a group of women regarding the celebration of Teej and Tihar festivals, it was found that 70% celebrated Teej, 60% celebrated Tihar but 10% didn't celebrate both the festivals while 20 celebrated Teej as well as Tihar.**

(a) If the sets of women who celebrate Teej and Tihar be A and B respectively, what is the value of $n(\overline{A \cup B})$? (1)

(b) Draw a Venn-diagram to illustrate the above information. (1)

(c) Find the number of women who celebrated Teej only. (3)

(d) Find the ratio of number of women who celebrated both the festivals and who celebrated none of the festivals. (1)

**2. Teriya deposited Rs. 10,00,000 in a development bank for 2 years to get the half yearly compound interest at the rate of 8% per annum. But just after 1 year, bank has changed the policy and decided to give the interest compounded quarterly at the same rate of interest.**

(a) Write the formula to calculate the interest compounded half-yearly. (1)

(b) Calculate the principal for the second year. (2)

(c) If the bank policy was not changed, how much more or fewer amounts would she get at the end of two years? Calculate it. (2)

**3. Mr. Himal purchased a microbus for Rs. 25,00,000. After using the microbus for three years, he earned Rs. 15,00,000. The value of the microbus depreciated by the rate of 10% per annum and the he sold it after three years.**

(a) If the purchasing price of the microbus is Rs.Vo, the rate of compound depreciation is R% per annum and price of the microbus after T years is Rs. $V_T$, then express $V_T$ in terms of $V_o$, R% and T. (1)

(b) Find the selling price of the bus after three years. (1)

(c) If Himal's wife Himani deposited Rs. 25,00,000 in a bank at the compound interest rate of 10% per annum, who will earn more after 3 years and by how much? (2)

**4. A business man exchanged some Canadian dollars with NRs 4,20,000 at the exchange rate of Canadian dollar 1= NRs. 105. After 5 days, Nepali currency was revaluated by 2% in comparison to Canadian dollar and on that day he exchanged the dollars into Nepali currency again.**

(a) How many Canadian dollars did he exchange with NRs 4,20,000? Find it. (1)

(b) Find the exchange rate of CAD $ 1 after devaluation in Nepali currency. (1)

(c) Calculate his gain or loss amount. (2)

**5. The height of a square based pyramid is 15 cm and the length of base is 16 cm.**

(a) How many triangular surfaces are there in a square based pyramid? (1)

(b) Find the height of the triangular faces. (1)

(c) Calculate the the cost of painting the total surfaces of the pyramid at the rate of Rs. 75 per 100 $cm^2$. (2)

**6. A masonry tool (plum bob) composed up of a cone and a hemisphere, hung from a string, is used to level the surface of wall. The radius and slant height of the conical portion are 2.1 cm and 7.5 cm respectively.**

(a) How the vertical height of a cone is calculated when its radius and slant height are given? (1)

(b) Calculate the total surface area of the plum bob. (2)

(c) If 1 $cm^3$ metal weighs 7.5 gram, find the weight of the plum bob excluding the string. (2)

**7. A room is 6 m long, 5 m wide and 4 m high. There are 2 square windows of edge 1.5 m and a door of size 1 m × 3 m in the room.**

(a) Find the cost of painting the four walls and ceiling of the room excluding door and windows at the rate of Rs. 50 per square meter? (2)

(b) If the room had only one window and a door of size as mentioned in the context and the rate of painting was increased by one third of what it was before due to the increase in the market price, how much would the total cost of painting the walls and ceiling of the room excluding door and window be? Find it. (2)

**8.** **The table given below represents the number of sweaters and pair of gloves sold in a Fancy Store during winter season.**

| Day | 1st | 2nd | 3rd | 4th | ... |
|---|---|---|---|---|---|
| No. of sweaters | 2 | 6 | 18 | 54 | ... |
| No. of pair of gloves | 5 | 15 | 25 | 35 | ... |

(a) Write the formula for finding the arithmetic mean between two numbers 'a' and 'b'. (1)

(b) How many sweaters are sold by the 8th day? Find it. (2)

(c) Compare the number of pair of gloves and sweaters sold by the 8th day. (2)

**9.** **The age difference between the mother and her daughter is 25 years. Now, the product of their ages is 600.**

(a) Write the roots of quadratic equation $ax^2 + bx + c = 0$. (1)

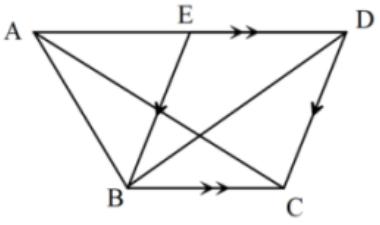
(b) Find their actual present age. (3)

(c) After how many years, the mother will be twice as old as her daughter? (1)

**10.** (a) Simplify: $\frac{a^2 + ab + b^2}{a + b} + \frac{a^2 - ab + b^2}{a - b}$ (2)

(b) Prove that the value of $x$ obtained by solving the exponential equation $5^{x-2} + 5^{3-x} = 6$ also satisfy the equation $4^x - 3 \times 2^{x+2} + 32 = 0$. (3)

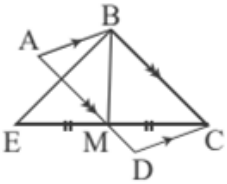
**11.** **In the figure, ΔABC, ΔDBC and ▱EBCD are on the same base BC and between the same parallel lines AD and BC.**




(a) Write the relation between the area of ΔABC and ▱EBCD. (1)

(b) Prove that: Area of ΔABC = Area of ΔDBC. (2)

(c) In the adjoining figure, M is any point of the side AD of the parallelogram ABCD and CM is extended to a point E such that CM = ME. Prove that: ▱ABCD = ΔBEC. (2)




**12.** **A circle with center O has central angle ∠POQ and circumference angle ∠PRQ standing on the same arc PQ.**

(a) Write the relation between ∠POQ and ∠PRQ. (1)

(b) If $\angle POQ = (5x)^\circ$ and $\angle PRQ = (x + 33)^\circ$, what is the value of $x$? (1)

(c) Experimentally verify that the relation between $\angle POQ$ and $\angle PRQ$ by drawing two circles of radii at least 3 cm are necessary. (2)

**13.** (a) Construct a parallelogram PQRS having side QR = 5.5 cm, PR = 8.9 cm and $\angle PQR = 120^\circ$. Also, construct a rectangle ABQR which is equal in area to the parallelogram PQRS. (3)

(b) Measure the length of side AR of the obtained rectangle ABQR and calculate the area of $\square PQRS$ with reason. (1)

**14. A person 1.68 meter tall observing upward to the top of a tower $30\sqrt{3}$ meter away from him, found the angle to be 30°.**

(a) What type of the given angle 30° is either angle of elevation or depression? Write it. (1)

(b) Sketch the required figure from the above context. (1)

(c) Find the height of the tower. (1)

(d) If the man looks at the top of the tower and to form the angle 45°, how many meters should he move towards the tower? Find it. (1)

**15. The marks obtained by the students in an examination are as follows.**

| Age (in years) | 0 – 10 | 10 – 20 | 20 - 30 | 30 - 40 | 40 – 50 |
|---|---|---|---|---|---|
| No. of people | 4 | 12 | $k$ | 9 | 5 |

(a) If the median of this data is 24, identify the median class. (1)

(b) Calculate the value of $k$. (2)

(c) Find the mean. (2)

(d) Compare the number of people of median and modal classes. (1)

**16. Paras planned to have two children at an interval of 5 years after married.**

(a) What is meant by independent events? (1)

(b) Find the probability of having both sons. (1)

(c) Show the probabilities of possible outcomes of getting son and daughter in a tree-diagram. (2)

(d) Compare the probability of having the children of same sex and different sex. (1)

**Best of Luck**

# SET-3

| | |
|---|---|
| Class: 10 | F. M.: 75 |
| Subject: C. Math | Time: 3 hrs |

***Attempt all the questions.***

**1.** **In a survey of 15000 students of different schools, 6000 of them were found to have tuition classes before the SEE examination. Among them, the ratio of students who studied Mathematics only and Science only is 5: 3. Likewise, 700 students studied both the subjects and 500 studied other subjects but not these two subjects.**

(a) If M and S denote the sets of students who studied Mathematics and Science respectively, write the relation among $n_o(M)$, $n_o(S)$, $n(M \cap S)$ and $n(M \cup S)$. (1)

(b) Represent the above information in a Venn-diagram. (1)

(c) Find the number of students who studied Science. (3)

(d) What percent of the students of the survey studied either Mathematics or Science? (1)

**2.** **Two years ago, Mr. Lamsal received Rs 5,00,000 as commission from the sale of Mrs. Shrestha's plot of land. Immediately, he deposited the entire commission amount in fixed deposit account in Nepal Bank for two years at the rate of 10% per annum interest being compounded annually. The bank charges 5% tax on the interest. But, the bank changed its policy last year and decided to calculate the interest semi-annually at the same rate.**

(a) How much net interest did he get last year after deducting the tax? (2)

(b) Find the interest of this year after deducting the tax. (2)

(c) After deducting the tax, by what percentage the interest of this year will be more than that of the last year? (1)

**3.** **Mr. Gurung bought a tripper for Rs 35,00,000. He used it for transporting construction materials and earned Rs 15,00,000 in 2 years. He sold it at 15% p.a. compound depreciation.**

(a) Define compound depreciation. (1)

(b) Calculate the price of the tripper after 2 years. (1)

(c) Find his total profit or loss percent during 2 years. (2)

**4.** **On November 26, 2025; Nepal Rastra Bank announced the following exchange rates of European Euro.**

| | |
|---|---|
| **Buying rate: € 1 = NRs. 164.28** | **Selling rate: € 1 = NRs. 164.98** |

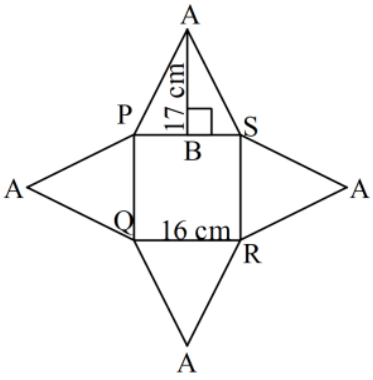
**On the same day, Mr. Sharma Magar bought some EURO (€) for NRs. 8,21, 400 to visit a few European countries. Unfortunately, because of his sickness, he cancelled his trip. Within a week Nepali rupee is devaluated by 5%. He again exchanged his EURO to Nepali rupee after a week.**

(a) How much Euro did he get? (1)

(b) Find the exchange rates after devaluation in Nepali rupee. (1)

(c) How much did he gain or lose? (2)

**5.** **The adjoining figure is a net made by Ramesh for a three-dimensional object in which PQ = QR = RS = PS = 16 cm and AB = 17 cm.**

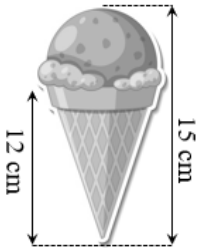



(a) For which solid did Ramesh make the net? (1)

(b) What is the total surface area of the solid? Calculate it. (2)

(c) Compare the vertical height and length of base of the solid formed from the net. (1)

**6.** **Kopila organized a party on the occasion of her daughter Kripa's first birthday. After meal, each of 100 people, including the family members, ate 1/1 cone filled with ice-cream as shown in the picture.**




(a) Write the formula to find the curved surface area of cone. (1)

(b) Find the volume of the ice-cream eaten by each person. (3)

(c) Each cylindrical ice-cream container has base diameter 12 cm and height 15 cm. At least how many cylindrical containers would she buy to make enough for all people? (1)

**7.** **A rectangular tank having internal length 5 m, breadth 3.2 m and height 2.5 m is constructed for distribution of water for a group of 5 families of a community.**

(a) What is the total cost of plastering the four internal walls of the tank at the rate of Rs. 500 per 3 square meter? (2)

(b) If each family consumes equal amount of water, how many litres of water is consumed by each family if the tank is completely filled once? (2)

**8.** **A licensed network business has started with a policy that each member should make 2 new members within every month. The following table represents the number of new members of the network business of the first five weeks.**

| Month | First | Second | Third | Fourth | Fifth |
|---|---|---|---|---|---|
| No. of new members | 4 | 8 | 16 | 32 | 64 |

(a) Identify and write the name of sequence based on the given context. (1)

(b) How many members will be there in the business by the 10th month? (2)

(c) Based on the above sequence, is 1 more month just after first anniversary of the establishment of the business enough to make altogether 32,000 members? Write it with reason. (2)

**9.** **In a rectangular field, the longer side is 40 m more than the shorter side but the diagonal of the field is 40 m more than its longer side.**

(a) Write the standard form of quadratic equation. (1)

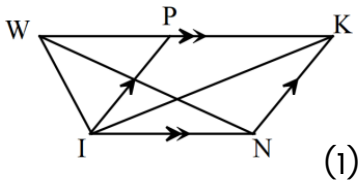
(b) Find the length and breadth of the field. (3)

(c) How many plots of land of dimension (40 m × 30 m) can be made on that field? (1)

**10.** (a) Simplify: $\frac{4x^3}{x^4 + a^4} - \frac{8x^7}{x^8 - a^8}$ (2)

(b) Solve: $16^x - 5 \times 4^{x+1} + 64 = 0$ (3)

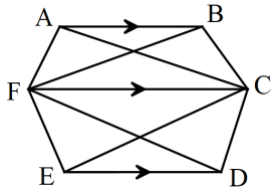
**11.** **In the given figure; WK // IN and IP // NK.**



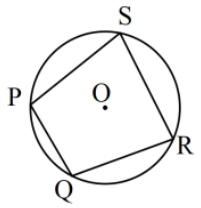

(a) Write the relationship between ΔINK and □PINK. (1)

(b) Prove that: area of triangle WIN = Area of triangle KIN. (2)

(c) In the figure, AB // FC // ED. Prove that: area of quadrilateral ACDF = Area of quadrilateral BCEF. (2)




**12.** **In a circle with centre O, PQRS is a cyclic quadrilateral.**




(a) Write the relationship between ∠PQR and ∠PSR. (1)

(b) Experimentally verify that ∠P and ∠R of a cyclic quadrilateral PQRS are supplementary. Two circles having radii at least 3 cm are necessary.) (2)

(c) If $\angle Q = (4x + 77)^\circ$ and $\angle S = (5x - 14)^\circ$, find the value of $x$. (1)

**13.** **Construct a parallelogram ABCD in which AB = 5 cm, BC = 4 cm and ∠ABC = 60°.**

(a) Construct a triangle having a side 6 cm and equal area to the parallelogram ABCD. (3)

(b) Justify with reason that 'area of □ABCD = area of ΔBEF'. (1)

**14. A person $\sqrt{3}$ m tall observing upward to the top of a tower which is $25\sqrt{3}$ m high, found the angle to be 30°.**

(a) How does the angle of elevation from? (1)

(b) Sketch the figure based on given context. (1)

(c) Find the height of the tower. (1)

(d) If the man looks at the top of the tower and to form the angle 45°, how many meters should he move towards the tower? (1)

**15. The first quartile of the given data is 40.**

| Marks obtained | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
|---|---|---|---|---|---|
| No. of students | 4 | 6 | *k* | 9 | 10 |

(a) Write the formula to calculate the first quartile of continuous data. (1)

(b) Find the value of 'k'. (2)

(c) Find the mode of the data. (2)

(d) Justify that the median and mode of this data lie in the same class. (1)

**16. There are 15 lemons of shape and size in a bag. Out of them 12 are yellow and the rest are green. Gita is going to take out two lemons from the bag one after the other without replacement.**

(a) If A and B are mutually exclusive events, what is the probability of $(A \cup B)$? (1)

(b) Show the probabilities of all possible outcomes in a tree-diagram. (2)

(c) Find the probability of getting both yellow lemons. (1)

(d) Compare the probability of getting same colored lemons and the probability of getting different colored lemons. (1)

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# SET-4

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|---|---|
| Class: 10 | F. M.: 75 |
| Subject: C. Math | Time: 3 hrs |

***Attempt all the questions.***

**1. In a survey, $\frac{3}{14}$ youth like only mathematics and 70 don't like mathematics at all. Also $\frac{9}{14}$ youth like Science but 20 like none of them.**

(a) If M= {Youth who like Mathematics} and S = {Youth who like Science} then write the value of $n(\overline{M \cup S})$. [1]

(b) Illustrate the above data in a Venn-diagram. [1]

(c) How many youths like both types of subjects? Compute it. [3]

(d) By what percentage the number of youth who like Mathematics only is less than that of Science only? Compare it. [1]

**2. Puja borrowed Rs 80, 000 for 2 years at 10% p.a. compounded annually. He paid only one fourth of the principal at the end of 2 years. He paid the remaining principal and interest at the same rate at the end of next 2 years.**

(a) The quarterly compound interest on a sum P in T years at R% p.a. is CI respectively. Write down the relation among P, T, R and CI. [1]

(b) Find the amount at the end of first two years. [1]

(c) How much amount did he pay at last to clear the debt? [2]

**3. A factory which was established at the investment of Rs 4 crore, earns Rs 75 lakhs as a profit in 3 years. But its cost was depreciated by 2.5% p. a. for the period and it sold.**

(a) In usual notation, what does $V_o - V_o\left(1 - \frac{R}{100}\right)^T$ stand for? [1]

(b) What will be the price of the factory after 3 years? [2]

(c) Find its loss or gain in the whole duration. [1]

**4. A students going to Canada for higher study needs Canadian dollar 5000. If Canadian $ 1 = Rs 98.50 and the bank charges 2% commission then,**

(a) Find the Nepali money required for the student. [2]

(b) If Nepali money is devaluated by 20% then how much Nepali money will be required? [1]

(c) If Nepali money was revaluated by 10% how much Nepali money would be required? In such situation, what will be the profit or loss to the students on exchange money? [2]

**5. 75 tourists are coming from USA to visit Annapurna. They planned to stay at Annapurna base camp for 4 days. For this purpose, they have ordered some square based pyramid tents in Nepal. A tent can hold 15 people and each person has 5 ft. × 3 ft. space on the ground with 50 cubic ft. of air to breathe.**

(a) What should be the area of base of a tent? [1]

(b) Find the length of base edge and vertical height. [2]

(c) Find the total cost required to make all tents at the rate of Rs 560 per $ft^2$. [2]

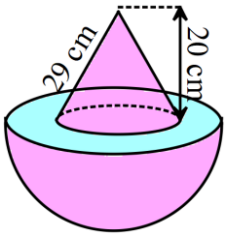
**6. The lower part of a tent is cylindrical and the upper part is hemispherical. The radius of both parts is the same. The total height of the tent is 7.1 m and the height of the cylindrical part is 5 m.**

(a) Draw a figure as per the information given in the question. [1]

(b) Find the total surface area of the tent. [2]

(c) The cost of cloth per square meter is Rs 500, find the total cost to construct the tent. [1]

**7.** **A toy is in the combined form of hemisphere and right cone. The diameter of the cone and radius of the hemisphere are equal.**




(a) Write the formula to calculate curved surface area of the toy. [1]

(b) Calculate the volume of the toy. [3]

**8.** **A firm produced 1000 radio sets during its first year. The total number of radio sets produced at the each of 10 years is 14500, assume that the production increased uniformly each year.**

(a) Write the sequence related to given context. [1]

(b) Estimate the increase in production each year. [2]

(c) How many radios will the firm produce in 15 years? [2]

**9.** **The government of Nepal decided to distribute an amount of Rs 1,00,000 equally among certain number of girls of a school. Had there been 5 girls more, each would have received Rs 1,000 less.**

(a) Write down the roots of quadratic equation $lx^2 + mx + n = 0$. [1]

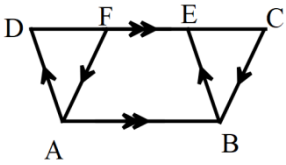
(b) Find the number of girls. [3]

(c) Find the amount of money received by each girl. [1]

**10.** (a) Simplify: $\frac{1}{x+1} + \frac{2}{x^2+1} + \frac{4x^4+4}{x^8-1}$ [3]

(b) Solve: $16^p - 5 \times 4^{p+1} + 64 = 0$ [2]

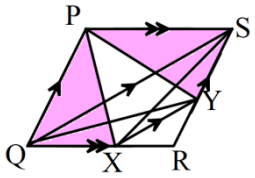
**11.** **Parallelograms ABED and FABC are on the same base AB and between the same parallels AB and CD.**




(a) Write the relationship between the area of □ABED and □FABC. [1]

(b) Prove that area of□ABED = area of □ABCF. [2]

(c) In the given figure, PQRS is a parallelogram. X and Y are the points on the sides QR and RS respectively such that QS // XY. Prove that the triangles PQX and PSY are equal in area. [2]

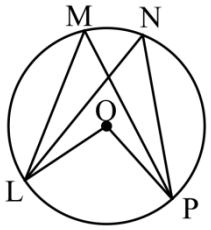



**12. A parallelogram ABCD has AB = 5.5 cm, AD = 6 cm and diagonal BD = 7 cm.**

(a) Construct the parallelogram ABCD and also construct another parallelogram EBCF which is equal in area to the parallelogram ABCD having the measurement of one angle 60°. [3]

(b) Calculate the area of parallelogram EBCF. [1]

**13. O is the centre of a circle. Central ∠LOP, inscribed ∠LMP and ∠LNP are standing on the same arc LP.**




(a) Write the relationship between the inscribed ∠LMP and ∠LNP. [1]

(b) The measure of central angle is $(9x + 2)^\circ$ and the measure of inscribed angle is $(4x + 5)^\circ$. Find the value of $x$. [1]

(c) Experimentally verify that the relationship between the inscribed ∠LMP and ∠LNP. (At least two circles with radii 3 cm are necessary.) [2]

**14. When a tree is broken by the wind from somewhere without detaching and its top touches the ground making an angle of 60o with the ground. The length of broken part of the tree 20 meter.**

(a) Define the angle of elevation. [1]

(b) Find the distance between top and bottom of the tree after broken. [1]

(c) What was the height of the tree before it was broken? Find it. [1]

(d) If the distance between the top and the bottom of the tree was equal to the remaining part of the tree when broken, how many degrees of angle would it make with the ground? Write with suitable argument. [1]

**15. The given data represents the monthly expenditure (in thousands) of the families of Dharampur Gaun.**

| Expenditure in Rs (000) | 15 – 25 | 25- 35 | 35-45 | 45- 55 | 55- 65 |
|---|---|---|---|---|---|
| No. of families | 4 | 6 | 12 | 5 | 3 |

(a) From the above data, write the class interval of mode. [1]

(b) From the above data, what is the expenditure of maximum family? [2]

(c) Find the value which divides the above data into two equal parts. [2]

(d) Dilmaya said that mode and median lie in the same class interval. Justify this statement. [1]

**16. There are one yellow, one red and one white sweet of same shape and size in a bag.**

(a) If a sweet is drawn at random, find the probability of getting red or white sweet. [1]

(b) A sweet is drawn randomly and with replacing the sweet, another sweet is drawn from the bag. Show all the possible outcomes of the probabilities in a tree-diagram. [2]

(c) Write the sample space. [1]

(d) What is the percentage of probability of getting red sweet in first time and white sweet in second time? [1]

**ꕥBest of Luck ꕥ**