

SECOND TERMINAL EXAMINATION – 2079**Class:** Nine**F.M.:** 75**Time:** 3 hours**Mathematics****P.M.:** 30

Candidates are required to answer in their own words as far as practicable. The figures in the margin represent the full marks.

Attempt **all** the questions.

- If $U = \{x: x \leq 10, x \in N\}$, $A = \{x: x \text{ is a prime number}\}$, $B = \{x: x \text{ is an odd number}\}$ and $C = \{x: x \text{ is divisible by } 4\}$
 - Write the cardinality of U . [1]
 - Show the above information in V.D. [1]
 - Prove that: $A - (B \cup C) = (A \cup B) - (B \cup C)$ [3]
 - What types of sets are $A \cup B$ and $A \cap B$? [1]
- Out of 150 students of class IX, 60 students passed in Mathematics, 70 students passed in Science and 20 students passed in both subjects.
 - Write the given information in set notation. [1]
 - Draw a Venn Diagram to illustrate the above information. [1]
 - How many students did not pass in both subjects? [3]
- An unmarried employee of a bank has monthly salary of Rs 60,000. He deposits 10% of his income to provident fund. According to the fiscal year 2077/7078

For an unmarried person	
Topic	Rate
Income upto Rs 4 lakhs	1%
4-5 lakhs	10%
5-7 lakhs	20%
7-20 lakhs	30%
More than 20 lakhs	36%

- Write the formula to find rate of income tax? [1]
 - Find the total yearly taxable income? [2]
 - How much tax he has to pay yearly? [2]
- Mr. Baral is a shopkeeper. He labels the price of a jacket Rs. 4000. Mrs. Gurung buys the jacket with 10% VAT after getting 15% discount.
 - Write the formula to find the discount percent. [1]
 - Find the selling price of Mr. Baral after discount. [2]
 - Find the buying price of Mrs. Gurung with VAT [2]
 - A hydropower company issues 2,00,000 shares each costing Rs 100 out of which Mr. Santosh bought 5000 shares. If the hydropower makes a profit of Rs. 85,00,000 in a year and decides to distribute 25% cash dividend to its shareholders.
 - From what amount is the cash dividend distributed? [1]
 - Find total cash dividend. [1]
 - Calculate the cash dividend of each share. [1]
 - How much cash dividend does Mr. Santosh receive? [2]
 - Sigma has 8 bigaha 16 kattha 6 dhur of land. Epsilon has 1 bigaha 17 kattha 15 dhur of land.
 - What is the relation between bigaha and kattha? [1]
 - How much **dhur** of land does Sigma have? [2]
 - Who has more land and by how much? [2]
 - Diwas and Divya are studying in grade IX. One day, Diwas draws a rectangle having length 8 cm and breadth 6 cm. Divya draws an equilateral triangle having a side 8 cm.
 - What is the area of rectangle drawn by Diwas? [1]
 - What is the area of triangle drawn by gaurav? [2]
 - Which figure is more spacious and by how much? [2]
 - There is a room in a school which is 10m long, 6m wide and 2.5m high having a door of dimensions 2 m $\times$ 1.5 m. The length and breadth of the paper are 40 cm and 25 cm respectively.
 - Find the area of four walls. [1]

SET-A

- (b) Find the area of door. [1]
 (c) Find the area of wall without door. [1]
 (d) Find the area of a piece of paper. [1]
 (e) How many pieces of paper are required to cover the four walls of a room. [1]
9. (a) Write down the formula of $x^2 - y^2$. [1]
 (b) Factorize: $x^4 + 2x^2y^2 + 9y^4$ [2]
 (c) If $x + y = 5$ and $x - y = 4$, find the value of $x^2 - y^2$. [2]
10. (a) Select and write HCF of $6x^2y^4$ and $10xy^2$ [1]
 (A) $6xy^2$ (B) $10xy^2$
 (B) $2xy^2$ (D) $30xy^2$
 (b) Find the LCM of $x^3 - y^3$ and $x^2 - 2xy + y^2$. [3]
11. If $2a^3 + 16$, $a^2 + 4a + 4$ and $a^2 + 3a + 2$ are given algebraic expressions
 (a) Find the factors of $2a^3 + 16$. [1]
 (b) Find the factors of $a^2 + 4a + 4$. [1]
 (c) Find the factors of $a^2 + 3a + 2$. [1]
 (d) Write HCF and represent it in a venn diagram? [2]
12. (a) Simplify: $\sqrt[4]{(x+y)^{11}} \times (x+y)^{-\frac{3}{4}}$ [2]
 (b) Simplify: $\frac{9^{n+2} + 10 \times 9^n}{9^{n+1} \times 11 - 8 \times 9^n}$ [2]
13. (a) What do you mean by law of zero index. [1]
 (b) Simplify: [3]

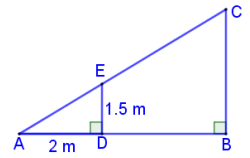
$$\left(\frac{x^a}{x^b}\right)^{a^2+ab+b^2} \times \left(\frac{x^b}{x^c}\right)^{b^2+bc+c^2} \times \left(\frac{x^c}{x^a}\right)^{c^2+ca+a^2}$$
14. (a) Draw two isosceles triangles naming PQR in which $PQ = QR$ and find mid-point M of the base QR and join P with M in each figure. [1]

- (b) Measure the size of $\angle PMQ$ and $\angle PMR$ and fill the result in the following table. [2]

Figure	$\angle PMQ$	$\angle PMR$	Result
(i)			
(ii)			

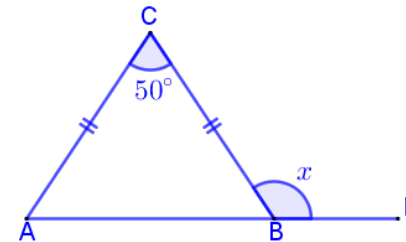
- (c) Write the conclusion from the above table. [1]

15. In the given figure CB is a tree and ED is the man. The tree and a man cast the shadow of 8 m and 2 m long respectively.



- (a) Show $\triangle ADE \sim \triangle ABC$. [3]
 (b) If the height of man is 1.5 m, find the height of the tree. [1]

16. (a) Find the value of x from the following figure. [2]



- (b) State giving reasons, whether it is possible to construct a triangle or not with its sides equal to 5 cm, 7 cm, 13 cm [2]

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