FIRST TEST AUGUST 2023

CLASS : I PUC   **SUBJECT : BASIC MATHEMATICS (75)**   **Max. Marks : 40**

TIME : 1 Hr. 30 Mins

PART - A

I **Answer all questions :**   **1 x 10 = 10**

1) The imaginary part of $4 - i$ is

   a) -1 b) 4   c) 1   d) -4

2) $\left(\dfrac{9}{4}\right)^{-3/2} =$

   a) $\dfrac{27}{8}$ b) $\dfrac{8}{27}$ c) $\dfrac{1}{8}$ d) $\dfrac{1}{27}$

3) The value when 200 is decreased by 40% is

   a) 280   b) 60   c) 150   d) 120

4) The value of $\cos A \cdot \operatorname{cosec} A$ is

   a) $\tan A$ b) $\sin A$ c) $\cot A$ d) $\sec A$

5) The co-ordinates of the reflection of the point (2, 4) with respect to x-axis is

   a) $(2, -4)$ b) $(-2, 4)$ c) $(-2, -4)$ d) $(2, 4)$

6) Give the canonical representation of 96.

7) Simplify $a^{x+y} \cdot a^{2x-y}$.

8) By selling a book at ₹ 250 the profit made is ₹ 50. What is the cost price of the book?

9) Express $\dfrac{9\pi}{5}$ into degrees.

10) Find the distance of the point (5, 6) from the y-axis.

PART - B

II **Answer any FOUR questions:**   **2 x 4 = 8**

11) If the product of two numbers is 216 and their LCM is 36. Find their HCF.

12) Simplify : $\dfrac{\left(3^{0}\right)^{3} + \left(3^{2}\right)^{0}}{\left(3^{2}\right)^{2} + 3^{\left(3^{0}\right)}}$:

13) After revaluation a student's mark was changed from 80 to 92. Find the percentage increase in marks.

14) The angles of a triangle are in the ratio $3 : 4 : 5$. Find them in radians.

15) Prove that $\left(1 + \tan^{2}\theta\right) \cdot \left(1 - \sin^{2}\theta\right) = 1$.

16) Find the co-ordinates of the point which divides the line joining the points (3, 2) and (1, 4) in the ratio $5 : 6$ internally.

PART - C

II **Answer any FOUR questions :**   **3 x 4 = 12**

17) Prove that $\sqrt{2}$ is an irrational number.

(PTO)

18) Simply $2^{2x} - 6 \cdot 2^x + 8 = 0$.

19) If $a^x = b^y = c^z$ and $b^2 = ac$. Show that $\dfrac{1}{x} + \dfrac{1}{z} = \dfrac{2}{y}$.

20) A dealer buys 200 quintals of wheat at ₹ 1200 a quintals. He spends ₹ 10,000 on transporation and storage. Then he sells the wheat at ₹ 13 per kg. Find his profit or loss. Also calculate it as a percentage.

21) Prove that $\dfrac{1}{1+\sin A} + \dfrac{1}{1-\sin A} = 2\sec^2 A$.

22) Find the area of the triangle whose vertices are A(3, 4), B(2, −1) and C(4, −6).

PART - D

IV   Answer any TWO of the following :   5x2=10

23) If abc = 1 then prove that $\dfrac{1}{1+a+b^{-1}} + \dfrac{1}{1+b+c^{-1}} + \dfrac{1}{1+c+a^{-1}} = 1$.

24) If $a^{1/3} + b^{1/3} + c^{1/3} = 0$ then show that $(a + b + c)^3 = 27abc$.

25) A radio is sold at a profit of 25%. Cost price and selling price both are increased by ₹ 100. If the new profit is at the rate of 20%, find the original cost of the radio.

26) If x = ar sin A cos B, y = br sin A sin B and z = cr cos A then prove that $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} + \dfrac{z^2}{c^2} = r^2$.

*****