Examdate → 6/4/25

21555

Paper–II

Part—I (GENERAL MATHEMATICS)

(Descriptive Type)

Full Marks : 50

Time : 1 hours

The figures in the margin indicate full marks for the questions

1. A train travels a distance of 300 km at constant speed. If the speed of the train is increased by 5 km an hour, the journey would have taken 2 hours less. Find the original speed of the train. 5

2. Solve the following system of equations :

$$\frac{1}{2x}-\frac{1}{y}=-1,\ \frac{1}{x}+\frac{1}{2y}=8$$

where $x \neq 0,\ y \neq 0$. 5

3. Two circles touch externally. The sum of their areas is 130π square centimetre and the distance between their centres is 14 cm. Find the radii of the circles. 5

4. At a point on the level ground, the angle of elevation of a vertical tower is found to be such that its tangent is $\frac{5}{12}$. On walking 192 metres towards the tower, the tangent of the angle of elevation is $\frac{3}{4}$. Find the height of the tower. 5

5. Two dice, one blue and one grey are thrown at the same time. Write down all possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is—

(a) 8 ;

(b) 13 ;

(c) less than or equal to 12 ? 5

6. The sum of the reciprocals of Rahman's age (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age. 5

7. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has *(a)* no girl and *(b)* at least one boy and at least one girl?

1+4=5

8. The sum of n terms of two arithmetic progressions are in the ratio $(3n+8):(7n+15)$. Find the ratio of their 12th terms. 5

9. Find the value of k, so that the function f defined by

$$f(x)=\begin{cases}\dfrac{k\cos x}{\pi-2x}, & \text{if } x\neq\pi/2\\ 3, & \text{if } x=\pi/2\end{cases}$$

is continuous at $x=\pi/2$. 5

10. Using integration, find the area enclosed by the parabola $4y=3x^2$ and the line $2y=3x+12$. 5

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