0297

SET -

Total No. of Questions - **21**
Total No. of Printed Pages - **3**

Regd. No.

Part - III

MATHEMATICS, Paper - II

(Bridge Course)

(English Version)

MODEL QUESTION PAPER

(For the Academic year 2021-22 only)

Time : **3 Hours**   *Max. Marks :* **75**

Note: This question paper consists of two sections A and B.

Section - A   **10×3=30**

I.   **Short Answer Type Questions.**

  (i)   **Answer ANY TEN questions.**

  (ii)   **Each question carries 3 marks.**

1.   Resolve $\dfrac{5x+1}{(x-1)(x+2)}$ into partial fractions.

2.   Resolve $\dfrac{x^2+1}{(x^2+x+1)^2}$ into partial fractions.

3.   Find the equation of the circle for which $(1, 2)$, $(4, 5)$ are the end points of a diameter.

4.   If the length of the tangent from $(5, 4)$ to the circle $x^2 + y^2 + 3ky = 0$ is 1, then find k.

5.   Find the polar of $(1, -2)$ with respect to the circle $x^2 + y^2 - 10x - 10y + 25 = 0$.

6.   Find centre and radius of the circle $3x^2 + 3y^2 - 5x - 6y + 4 = 0$.

7.   Find power of $(2, 3)$ w.r.t. the circle $x^2 + y^2 - 2x + 8y - 23 = 0$.

8.   Find the mean deviation about the mean for the following data:

     3, 6, 10, 4, 9, 10.

                                                                                       Turn Over

9. Find the mean deviation about the median for the following data:

    6, 7, 10, 12, 13, 4, 8, 12

10. Evaluate $\int \dfrac{\sec^2 x}{(1+\tan x)^3}\,dx$ on $I \subset IR - \left\{n\pi - \dfrac{\pi}{4} : n \in Z\right\}$.

11. Evaluate $\int \dfrac{x}{1+x^2}\,dx$

12. Evaluate $\int \dfrac{\cos(\log x)}{x}\,dx$

13. Evaluate $\int\limits_{0}^{4} (x + e^{2x})\,dx$

14. Evaluate $\int\limits_{0}^{2} |1-x|\,dx$

15. Form the differential equation of the family of curves $y = ae^{3x} + be^{4x}$, where a and b are parameters.

Section - B   **3×15=45**

II. **Long Answer Type Questions.**

   (i)   **Attempt ANY THREE questions.**

   (ii) **Each question carries fifteen marks.**

16. a) Resolve $\dfrac{2x^2 + 3x + 4}{(x-1)(x^2+2)}$ into partial fractions.   (8)

    b) Resolve $\dfrac{x^3}{(x-a)(x-b)(x-c)}$ into partial fractions.   (7)

17. a) If (2,1), (0,1), (4,5) and (0,C) are concyclic, then find C.   (8)

    b) Find the coordinates of the vertex, focus, the equation of the

        directrix and the axis of the parabola $y^2 + 4x + 4y - 3 = 0$.   (7)

18. a) Find the equation of the circle passing through the points   (8)
        (1,–6), (5,2), (7,0).

    b) Find the equations of the circle passing through (0,0) and making

        intercepts 4, 3 on x-axis, y-axis respectively.   (7)

19. a) Evaluate $\int \dfrac{9\cos x - \sin x}{4\sin x + 5\cos x}\,dx$ (8)

b)   Evaluate $\displaystyle\int_{0}^{\frac{\pi}{2}} \frac{a\sin x + b\cos x}{\sin x + \cos x}\, dx$ (7)

20.   a)   Evaluate $\displaystyle\int \frac{\sin x \cos x}{\cos^{2} x + 3\cos x + 2}\, dx$ (8)

     b)   Solve the differential equation :

$$\frac{dy}{dx} = \tan^{2}(x+y)$$ (7)

21.   a)   Evaluate $\displaystyle\int \frac{dx}{\cos^{2} x + \sin 2x}\, dx$ (8)

     b)   Evaluate $\displaystyle\int_{0}^{\pi/2} \frac{dx}{4 + 5\cos x}$ (7)

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