

**297****III**

Total No. of Questions – 15

Regd.

Total No. of Printed Pages – 3

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**MATHEMATICS, Paper-II (BRIDGE COURSE) for Bi.P.C.
Candidates
(English Version)**

*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 all the questions.
(ii) Each question carries three marks.

1. Resolve $\frac{x+4}{(x^2-4)(x+1)}$ into partial fractions.
2. Resolve $\frac{2x+3}{(x-1)^3}$ into partial fractions.
3. Find the equation of a circle which is concentric with $x^2 + y^2 - 6x - 4y - 12 = 0$ and passing through $(-2, 14)$.
4. If the length of the tangent from $(2, 5)$ to the circle $x^2 + y^2 - 5x + 4y + k = 0$ is $\sqrt{37}$, then find k .
5. Find the mean deviation about the mean for the following data :
6, 7, 10, 12, 13, 4, 12, 16.

6. Find the variance and standard deviation for the following data :

5, 12, 3, 18, 6, 8, 2, 10

7. Evaluate $\int (\tan x + \log \sec x)e^x dx$.

8. Evaluate $\int_0^4 \frac{x^2}{1+x} dx$.

9. Find the general solution of $\sqrt{1-x^2} dy + \sqrt{1-y^2} dx = 0$.

10. Solve the differential equation $\frac{dy}{dx} = \frac{xy+y}{xy+x}$.

SECTION - B

3 × 15 = 45

II. Long answer type questions :

(i) Answer any three questions.

(ii) Each question carries fifteen marks.

11. (a) Resolve $\frac{x^3 + x^2 + 1}{(x^2 + 2)(x^2 + 3)}$ into partial fractions.

(b) Resolve $\frac{x^2 + 13x + 15}{(2x + 3)(x + 3)^2}$ into partial fractions.

12. (a) Find the equation of the circle which is orthogonal to each of the following circles :

$$x^2 + y^2 + 2x + 17y + 4 = 0$$

$$x^2 + y^2 + 7x + 6y + 11 = 0$$

$$x^2 + y^2 - x + 22y + 3 = 0$$

(b) Find the equation of the parabola whose axis is parallel to y-axis and which passes through the points (4, 5), (-2, 11) and (-4, 21).

13. (a) Find the mean deviation about the median for the following data :

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60
Number of boys	6	8	14	16	4	2

- (b) Find the variance and standard deviation for the following data :

x_i	4	8	11	17	20	24	32
f_i	3	5	9	5	4	3	1

14. (a) Evaluate $\int \frac{2x^2 + x + 1}{(x + 3)(x - 2)^2} dx$.

(b) Evaluate $\int \frac{dx}{5 + 4 \cos 2x}$.

15. (a) Evaluate $\int_0^{\pi} \frac{x \sin x}{1 + \sin x} dx$.

(b) Evaluate $\int_0^{\pi/4} \frac{\sin x + \cos x}{9 + 16 \sin 2x} dx$.

13. Find the mean deviation about the median for the following

Class	Number of boys
0-10	8
10-20	14
20-30	10
30-40	10
40-50	5

(b) Find the variance and standard deviation for the following

x	f
1	1
2	3
3	4
4	3
5	1

14. (a) Evaluate $\int \frac{dx}{(x+2)(x-2)}$

(b) Evaluate $\int \frac{dx}{x^2 + 4x + 2}$

15. (a) Evaluate $\int \frac{x \sin x}{1 + \cos x} dx$

(b) Evaluate $\int \frac{\sin x + \cos x}{9 + 16 \sin^2 x} dx$