

297**III**

Total No. of Questions – 15

Regd.

Total No. of Printed Pages – 2

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**MATHEMATICS (BRIDGE COURSE) for Bi.P.C. Candidates, Paper-II
(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. Show that $\frac{2}{3!} + \frac{4}{5!} + \frac{6}{7!} + \dots = \frac{1}{e}$.

3. Find the equation of the circle passing through (2, -1) and having centre at (2, 3).

4. Find the parametric equations of the circle $(x-3)^2 + (y-4)^2 = 8^2$.

5. Find the mean deviation about Median for the following data 4, 6, 9, 3, 10, 13, 2.

6. Find the standard deviation of the following data 5, 12, 3, 18, 6, 8, 2, 10.

7. Evaluate $\int e^x [\sec x + \sec x \tan x] dx$.8. Evaluate $\int_1^3 \frac{2x}{1+x^2} dx$.9. Find the order and degree of the differential equation $\left[\frac{d^2y}{dx^2} + \left(\frac{dy}{dx} \right)^3 \right]^{6/5} = 6y$.10. Find the general solution of $x + y \cdot \frac{dy}{dx} = 0$.

SECTION - B

 $3 \times 15 = 45$

II. Long answer type questions :

- (i) Answer any **three** questions.
 (ii) **Each** question carries **fifteen** marks.

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

(b) Resolve $\frac{1}{(1 - 2x)^2(1 - 3x)}$ into partial fractions.

12. (a) Find the mean deviation about mean of the following data :

x_i	2	5	7	8	10	35
f_i	6	8	10	6	8	2

(b) Find variance and standard deviation of the following frequency distribution.

Class interval	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	3	7	12	15	8	3	2

13. (a) Find the equation of the circle passing through the points (3, 4), (3, 2), (1, 4).
 (b) Find the eccentricity, foci and length of latus rectum of the following ellipse $9x^2 + 16y^2 - 36x + 32y - 92 = 0$.

14. (a) Evaluate $\int \frac{1}{4x^2 - 4x - 7} dx$.

(b) Evaluate $\int \frac{1}{4 + 5 \sin x} dx$.

15. (a) Evaluate $\int_0^{\pi/2} \frac{\cos^{\frac{5}{2}} x}{\cos^{\frac{5}{2}} x + \sin^{\frac{5}{2}} x} dx$.

(b) Evaluate $\int_0^{\pi/4} \log(1 + \tan x) dx$.