

Register Number :

Name of the Candidate :

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B.Sc. DEGREE EXAMINATION, 2012

**(APPLIED CHEMISTRY / ELECTRIC SCIENCE /
PHYSICS)**

(SECOND YEAR)

(PART - III - B - ANCILLARY)

660 / 650. MATHEMATICS - II

December]

[Time : 3 Hours

Maximum : 75 Marks

Answer any FIVE questions.

ALL questions carry EQUAL marks.

1. (a) Evaluate $\int \cot^4 x \, dx$

(b) Evaluate $\int \tan^5 x \, dx$

Turn Over

\int_0^{π}

2. (a) Evaluate $\int xy(x - y) dy dx$

(b) Evaluate $\int F \times n ds$,

where $F = iy - jx$ and S is the closed surface of the sphere $x^2 + y^2 + z^2 = a^2$.

3. (a) Solve $x = y^2 = \log p$

(b) Solve $(D^2 + 5D + 4)y = 3 - 2x$

$$\left[\frac{y^2 e^{-2x}}{(2+S^2+xy)(1+S^2)} \right]$$

4. Solve $-2 - 3y = 2e^{2x} + 10 \sin 3x$

given that $y(0) = 2$ and $y'(0) = 4$.

5. (a) Solve $(y^2 + z^2) p - xyq = -xz$.
 (b) Solve $q^2 - 3q + p = 2$

6. (a) Solve $q - p + x - y = 0$.
 (b) Solve $p^2 + qy = yz$.

7. Express as a Fourier series

$$f(x) = \sin x \quad (0 < x < \pi)$$

$$= 0 \quad (\pi < x < 2\pi).$$

8. (a) Find a sine series for $f(x) = c$ in the range

0 to π .

(b) Find a cosine series in the range 0 to π

for

$$f(x) = x \quad 0 < x < \pi$$

$$= \pi - x \quad \pi < x < 2\pi.$$

9. (a) Find the Laplace transforms of $t^3 - 3t^2 + 2$.

(b) Find L^{-1}

10. Solve $+ 2y = 4$

subject to $y = 2$

$$\text{and } \frac{dy}{dx} = 3$$

when $x = 0$.