

S.B. Roll No.....

Applied Mathematic-II
2nd Exam/Common/2354/5422/2251/Nov'15

Duration 3hrs.

M. Marks 75

SECTION- A

Q. 1 (A) Choose the correct answer.

1x5=5

- i) Differentiate x^2 w.r.t x^3 and value is
(a) $\frac{3x}{2}$ (b) $\frac{2}{3x}$ (c) x (d) $2x$
- ii) The equation of normal to curve $y = \sin x$ at $(0,0)$ is
(a) $X = 0$ (b) $y = 0$ (c) $x+y = 0$ (d) $x-y = 0$
- iii) The probability that a card drawn at random from a pack of cards is a queen is
(a) $\frac{4}{52}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{1}{13}$
- (IV) Which one is a measure of dispersion
(a) Mean (b) Range (c) Mode (d) Median
- (V) A square Matrix A is singular if $|A|$ is
(a) 0 (b) 1 (c) 2 (d) 3

B. State True or False

1x5=5

- i) The square of standard deviation is called variance.
- ii) Derivative of x^3 is $3x$
- iii) $\int e^x dx = e^x$
- iv) $\lim_{\theta \rightarrow 0} \frac{Lt}{\frac{\sin 2\theta}{2\theta}} = 1$
- v) The Transpose of a symmetric matrix is equal to itself

(C) Fill in the blanks:

1x5=5

- i) The probability of tossing a coin of getting a head is _____.
- ii) $\frac{d(\log x)}{dx} =$ _____.
- iii) Area of the region bounded by curve $y = x - x^2$ between $x=0$ & $x=1$ is _____.

IV) Inverse of Matrix A is equal to _____.

V) If $\begin{vmatrix} 8 & k \\ 4 & 5 \end{vmatrix} = 0$ then $k =$ _____.

SECTION- B

Q. 2. Attempt any Six Questions

5x6=30

- i) Evaluate $\int \frac{dx}{x^2 - 4x + 8}$
- ii) Using trapezoidal rule to find area under the curve whose ordinates are given below

x	0	1	2	3	4	5
y	0	2.5	3	4.5	5	7.5
- iii) Using Cramer's rule find the values of x & y from the system of equations:
 $2x - y = 1$
 $7x - 2y = -7$

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IV) A bag contains 6 red, 5 white & 4 black balls Two balls are drawn, find the probability that none of them is red.

V) Solve differential equation $\frac{dy}{dx} = (4x + y + 1)^2$

VI) Evaluate $\int \frac{\sin x}{\sin x - \cos x} dx$

VII) Evaluate $\int_0^{\pi/2} \sin^5 x \cos^7 x dx$

VIII) If $y = A \cos nx + B \sin nx$ show that $\frac{d^2y}{dx^2} + n^2y = 0$

IX) If $x^y = y^x$ find $\frac{dy}{dx}$

SECTION- C

Q. 3. Attempt any Three Questions

10x3=30

1) Solve the following equations by matrix method

$$8x + 4y + 3z = 18$$

$$2x + y + z = 5$$

$$x + 2y + z = 5$$

2) Evaluate $\int \frac{x^2 \tan^{-1} x}{1+x^2} dx$

3) Find standard deviation of the following

x	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
y	5	10	20	40	30	20	10	4

4) Find the maximum & minimum value of the function $f(x) = x^4 - 6x^2 + 8x + 11$

5) Differentiate $(\tan x)^{\log x} + x^x$ w.r.t. x