S.B. Roll No..

APPLIED MATHEMATICS-II
2nd Exam/Common/2354/2251/5422/May'18

Duration: 3Hrs.   **M.Marks:75**

SECTION-A

Q1. Choose the correct answer   **5x1=5**

   i) If a square matrix A has two identical rows or columns, then det A =
     a) 0   b) 1   c) -1   d) none

   ii) $\frac{d}{dx}(\tan^{-1}(\cot x)) =$
     a) $-cosec^2 x$ b) -1 c) $sin^2 x$ d) 1

   iii) $\int \log x \, dx$ is equal to
     a) $\frac{1}{2}(\log x)^2$ b) $\frac{1}{x}$ c) $x\log x - x$ d) $2\log x$

   iv) If $x = a\cos^3 t, y = a\sin^3 t$, then $\frac{dy}{dx}$ is equal to
     a) $\cot t$ b) $\cos t$ c) $cosec \, t$ d) $-\tan t$

   v) Degree of $(\frac{d^2 y}{dx^2})^2 = (1 + \frac{dy}{dx})^3$ is
     a) 2   b) 3   c) 1   d) 4

Q2. State True or False.   **5x1=5**

   a. $\frac{d}{dx}(x\sin x) = x\cos x$
   b. If $D = D_1 = D_2 = D_3 = 0$, system has infinite solution.
   c. $\frac{d}{dx}(\frac{1}{x}) = \log x$
   d. If tangent is parallel to x -axis, then slope of curve is zero.
   e. $\int e^{mx} dx = me^{mx}$

Q3. Fill in the blanks.   **5x1=5**

   i. If S = cos2t, then velocity is ....
   ii. The anti derivative of x^n is ....
   iii. $\int_{-a}^{a} f(x)dx = 0$ is an .... function.
   iv. Relationship between mean, median, and mode is ....
   v. The probability of an impossible event is ....

SECTION-B

Q4. Attempt any six questions.   **6x5=30**

  i) Solve by means of determinants the following equations
    $3x + 2y = 7$
    $11x - 4y = 3$

  ii) The velocity of a body moving in a straight line at different times is given below

t (sec)	0	1	2	3	4	5
v (m/sec)	4	3.98	3.87	3.55	2.83	0.61

    Evaluate the distance in 5 sec.

  iii) Evaluate $\int_0^{\pi/6} Cos^5 3x \, dx$

  iv) Solve $3e^x \tan y \, dx + (1+e^x) Sec^2 y \, dy = 0$

  v) Find the equation of the normal to the curve $y = 6x^2 - 5x + 3$ at (1,4)

  vi) If $y = \tan(x + y)$, prove that $\frac{dy}{dx} = -\frac{1+y^2}{y^2}$.

  vii) Find $\frac{d^4 y}{dx^4}$ if $y = x^3 \log x$

  viii) Evaluate $\int \frac{e^x}{e^{2x}+6e^x+5} dx$.

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ix) A card is drawn from a well shuffled pack of playing cards. What is the probability that it is either a spade or an ace?

SECTION-C

Q5. Attempt any three questions. 3x10=30

i) Find the maximum or minimum values of the function $2x^3 - 21x^2 + 36x - 20$

ii) a) Evaluate $\int \frac{\cos x}{\cos 3x}$

b) Differentiate $Sin^n x^n$ w.r.t x.

iii) Solve the following equations by matrix method

$10x + 10y - z = -2$

$x + 5y + 2z = 0$

$x - 5y - z = 4$

iv) Evaluate $\int \frac{(x^2+4)}{(x^2+1)(x^2+3)} dx$

v) Calculate the median and standard deviation from the following data

Class Interval	1-10	11-20	21-30	31-40	41-50	51-60
Frequency	3	16	26	31	16	8