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APPLIED MATHEMATICS – II 2nd Exam/Common/2354/2251/5422/May'17

Duration: 3 Hours		CECTIO	M. Marks:75				
Q1. (A)	Choose the correc	t answer:	N – A	5x1=5			
(i)	If D ≠ 0, then system h (a) Infinite Solution	nas (b) Unique Solution	(c) Not a Solution	(d) None of the above			
(ii)	$\lim_{x \to 0} \frac{\sin x - x}{x} =$ (a) 1	(b) -1	(c) 0	(d) ∞			
(iii)	$\int_0^1 \frac{1}{1+x^2} dx =$						
	(a) $\frac{\pi}{2}$	(b) $\frac{\pi}{4}$	(c) 1	(d) 0			
(iv)	The order of different	ial equation $\left(\frac{d^4y}{dx^4}\right)^2$ +	$3(\frac{d^2y}{dx^2})^4 + y = 0$ is				
	(a) 4	(b) 2	(c) 8	(d) 1			
(v)	If $f(-x) = f(x)$ then th (a) odd	e function is (b) even	(c) both	(d) none			
(B) i. ii. iii. iv. v.	State true or false. $5x1=5$ $\int \log x dx = \frac{1}{x}$ If $A = \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$ then $ A = 1$ The differential coefficient of a constant is one.Tossing of a coin is an event and the turning up of head and tail is a trial.Median is a measure of central tendency.						
(C) i. ii. ii. iv. v.	Fill in the blanks. Derivative of x^6 w.r.t A matrix is said to be s The square of Arithmetic mean of 10 Area bounded by the	x^3 is singular if its is called variance.) terms is 7. If each term curve, y = 4 x - x^2 and x	is decreased by 3, the -axis and the ordinates	5x1=5 n the new mean is s <i>x</i> =1 and <i>x</i> =3 is			
02 Δτ	tempt any six quest	SECTIO	N – B	6x5=30			
(i)	If $x^y = e^{x-y}$ Prove t	hat $\frac{dy}{dx} = \frac{\log x}{\log x}$		073-30			
(ii) (iii)	Evaluate $\int x \cos^2 x d$ Using Cramer's rule fit 6x - 4y = -24 5x - 11y = -43	$dx (1+\log x)^2$ dx and the value of x and y	for				
(iv) (v)	If $y = (\tan^{-1} x)^2$ Pro Find the equation of t	ve that $(1 + x^2)^2 y_2 + 2^2$ angent to the curve $y =$	$2x(1 + x^2)y_1 = 2$ $9x^2 - 12x + 9$ which	is parallel to <i>x- axis</i>			

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(vi) Find the approximate area under the smooth curve whose ordinates are given below by the method of trapezoidal rule

x	1	2	3	4	5	6	7	8
у	2	2.6	3	3.2	2.8	2	1.5	1

- (vii) Evaluate $\int \frac{\cos x \, dx}{2\cos x + \sin x}$
- (viii) The students work independently on a problem. The probability that the first will solve it is $\frac{2}{3}$ and probability that the second one will solve is $\frac{2}{9}$. Find the probability that the problem will be solved.
- (ix) Solve $(xy^2 + x)dx/dy = yx^2 y$

SECTION – C

Q3. Attempt any three questions.

3x10=30

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(i) Solve the following equations by matrix method

x + y - z = -2 2x - y - z = -74x + y + 2z = 4

(ii) Find the maximum and minimum values of the function $2x^3 - 15x^2 + 36x + 10$

(iii) Calculate the standard deviation from the following data

x	25	35	45	55	65	75	85
f	3	61	132	153	140	51	2

(iv) Show that

$$\int_0^{\pi/4} \log (1 + \tan \theta) d\theta = \frac{\pi}{8} \log 2$$

(v) Solve

$$x^2 \frac{dy}{dx} = x^2 - 2y^2 + xy$$