Seat Number :- _____

Duration : 2 ½ Hours D217A23BM Marks : 75

Note : 1. All questions are compulsory.
2.Figures to the right indicate marks.
3. Use of Simple calculator is allowed.

Q1) (A)Select the right answer from tge following Multiple choice questions. (Any 8) **8 M**

1) ${}^{11}C_4$= _____.
A) 320 B) 220 C) 330 D) 440 (CO1,R)

2) If the payments are paid at the beginning of each period, it is known as an _____
A) Immediate Annuity B) Life Annuity C) Annuity Certain D) Annuity Due (CO3,R)

3) The population of a city is 50 lakhs. If it increases to 73,20,500 after four years what will be thc rate of increase per year?
A) 10% B) 15% C) 5% D) 20% (CO3,R)

4) The derivative of derivative is called
A) Anti-derivative B) secondary derivative
C) second order derivative D) Partial derivative (CO2,R)

5) The derivative of log x w.r.t. x is
A) 1 / x B) 1 C) 0 D) 1/2 (CO2,R)

6) The derivative of 4^x w.r.t. x is
A) 4^x B) $4^x \log 4$ C) $4^x \log x$ D) 0 (CO2,R)

7) If the total cost function is $C = 4 + 3x + x^2$ find the cost when x is 4 units
A) 68 B) 143 C) 54 D) 8 (CO1,2 ,R)

8) A square matrix whose determinant value is non-zero is called
(a) Non-singular matrix (b) Singular matrix (c) Null matrix (d) Row matrix (CO1,2 ,R)

9) For matrix multiplication, the number of columns of first matrix should be ---------- number of rows of second matrix.
(a) Less than (b) equal to (c) more than (d) square of (CO1,R)

10) The number of ways in which 3 boys and 4 girls can be arranged in a row so that all the three boys are together are
(a) 3! x 4! (b) 5! x3! (c) 7! (d) 4! (CO2,R)

Q1) (B) State whether the following statements are True or False. **7 M**

1) The derivative of a constant number is always 0. (CO1,R)
2) The sum of principal and interest is called amount. (CO3,R)
3) Simple interest is greater than compound interest for all years. (CO3,R)
4) Revenue = demand x price. (CO2,R)
5) BEP means where the demand curve cuts the revenue curve. (CO2,R)
6) When all the elements of the Matrix are zero it is called the Square Matrix. (CO1,R)
7) The value of 0! Is 1. (CO1,R)
8) C means contribution in annuity. (CO3,R)
9) RBM is better than FIR (CO3 ,R)
10) Dr. Albert has given the formula of the forward table. (CO1 ,R)

Q2) (A) If a loan of Rs. 200000 taken for 4 years @ 12% p.a.c.i. find the EMI using (i) RBM (ii) FIR methods.

(CO1,3,A) **8M**

Q2) (B) If Rs. 20000 invested for 4 years @ 10% p.a.c.i. find the amount if interest compounded (i) annually (ii) half yearly.

(CO1,3,A) **7M**

OR

Q2) (C) Find the value of (1) 7P4 (2) 12P3 (3) 6C4 (4) 10C2 (CO1,2,A,R) **8M**

Q2) (D) the total cost and total revenue function is $C = 20 - 3x^2$ and $5x + 6x^2$. Find TP,AP. (CO1,2,A) **7M**

Q3) (A) Find A x B, if $A = \begin{pmatrix} 7 & 6 & 8 \\ 6 & 4 & 3 \\ 5 & 4 & 6 \end{pmatrix}$ $B = \begin{pmatrix} -5 & 3 & 2 \\ 5 & -4 & 3 \\ 3 & 5 & -2 \end{pmatrix}$ (CO1,2,A,R) **8M**

Q3) (B) Expand $A = \begin{vmatrix} x & y & z \\ y & z & x \\ z & x & y \end{vmatrix}$ (CO2 ,R,U) **7M**

Q3) (C) If $A = \begin{pmatrix} 5 & 9 \\ 4 & 5 \end{pmatrix}$ $B = \begin{pmatrix} 6 & 8 \\ 3 & 7 \end{pmatrix}$ find $2A + 3B + I$. (CO1,2,A)

Q3) (D) Solve the following equations simultaneously using Cramer's rule.
$x+2y+z = 6$, $2x - 2y + z = 1$, $-x + 2y - 2z = 5$ (CO1,2A)

Q4) (A) Find Dy /dx of $Y = (8x^2 + 4x + 5) / (x+4)$ by divide rule (CO1.2 ,A) **8M**

Q4) (B) If the Revenue function of a commodity is given by $R = 5D^3 + 4D^2 + 10D$ find TR, AR, MR when D = 5. (CO1,2,AR) 7M

OR

Q4) (C) Price (x) and Supply (Y) for a certain commodities in a retail shop is as follows. Estimate the supply when price was Rs. 15 using NFIF. (CO1,2,) **8M**

X	12	16	20	24
Y	56	60	68	72

Q4) (D) Find Newtons forward difference table.(CO1,2,A) **7M**

X	10	20	30	40	50	60
Y	4000	3847	3704	3571	3448	3333

Q5) Write Short Notes (Any 3) **15M**

1) Types of interest (CO3,R)
2) Types of matrices (CO2,R)
3) Permutation and Combination (CO1,R)
4) Formulas of annuities and EMI's (CO3,U,R)
5) Formulas of cost and revenue functions (CO2,R)

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