

Duration :- 02:30 Hours

62308424

Marks :- 75

Note :- All questions are compulsory.
 Figures to the right indicate full marks.

Q1) (A) Select the right answer from the following Multiple choice questions. (Any 8)(CO1,2,R,U) 8 M

- 1) ${}^{11}P_2 =$ _____
 A) 110 B) 220 C) 330 D) 440
- 2) If the payments are paid at the end of each period, it is known as an _____
 A) Immediate Annuity B) Life Annuity C) Annuity Certain D) Annuity Due
- 3) The population of a city is 50 lakhs. If it increases to 73,20,500 after four years what will be the rate of increase per year?
 A) 10% B) 15% C) 5% D) 20%
- 4) The derivative of derivative is called
 A) Anti-derivative B) Square derivative
 C) Second order derivative D) Partial derivative
- 5) The derivative of "x" w.r.t. x is
 A) $1/x$ B) 1 C) 0 D) $1/2$
- 6) The derivative of x^4 w.r.t. x is
 A) 4^x B) $4^x \log 4$ C) $4x^3$ D) 0
- 7) If the total cost function is $C = 4 + 3x + x^2$ find the cost when x is 3 units
 A) 68 B) 22 C) 54 D) 8
- 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
- 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
- 10) The number of ways in which 5 boys and 4 girls can be arranged in a row so that all the three boys are together are
 (a) $3! \times 4!$ (b) $5! \times 4!$ (c) $9!$ (d) $4!$

Q1) (B) State whether the following statements are True or False. (CO1,2,R,U)

7M

- 1) The derivatives of a constant number is always 100.
- 2) The sum of principal and interest is called amount.
- 3) Simple interest is greater than compound interest for all years.
- 4) Revenue = demand x price.
- 5) BEP means where Revenue equal Cost.
- 6) When all the elements of Matrix are zero it is called Null Matrix.
- 7) The value of $0!$ is 5.
- 8) C means contribution in annuity.
- 9) RBM is better than FIR method.
- 10) Dr. Albert has given formula of forward table.)

Q2) Solve the following. (CO1,2,A)

8+7 = 15M

- (A) If Rs. 50000 invested for 4 years @ 10% p.a.c.i. find the amount if interest compounded (i) annually (ii) half yearly.
- (B) If a loan of Rs. 500000 is taken for 5 years @ 12% p.a.c.i. Find the EMI using (i) RBM (ii) FIR methods.

OR

(C) Find the 3 digits number from the following numbers given are 1,2,3,7,8,9. (i) if the repetition is not allowed and (ii) if repetition of numbers is allowed.

(D) From the group of 6 boys and 4 girls, a committee of 2 boys and 2 girls is to be formed. Find the number of such committees.

Q3) Solve the following. (CO1,2,A)

8+7 = 15M

(A) Find AB & BA, if $A = \begin{pmatrix} 6 & 5 & -4 \\ 6 & -5 & 3 \\ -5 & 4 & 6 \end{pmatrix}$ $B = \begin{pmatrix} -5 & 4 & 2 \\ 5 & -4 & 3 \\ 3 & 2 & -3 \end{pmatrix}$

(B) If $A = \begin{pmatrix} 5 & 10 \\ 4 & 9 \end{pmatrix}$ $B = \begin{pmatrix} 6 & 5 \\ 6 & 3 \end{pmatrix}$ find $5A + 3B - 4I$.

OR

(C) Expand $\begin{pmatrix} 10 & 18 & -16 \\ 7 & -9 & 15 \\ -6 & 8 & 14 \end{pmatrix}$

(D) Expand $A = \begin{pmatrix} a & b & c \\ b & c & a \\ c & a & b \end{pmatrix}$

Q4) Solve the following. (CO1,2,A)

8+7 = 15M

(A) Find Dy/dx of $Y = (5x^2 + 4x + 5) / (2x+5)$ by divide rule

(B) If the Revenue function of a commodity is given by $R = 3D^3 + 4D^2 + 40D$ find TR, AR, MR when $D = 10$.

OR

(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

(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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