March-2016

OP3AFJ

FYBMS

Bus. Maths

Time : 2.5 Hrs. **Marks : 75**

Instructions

1. **All questions are compulsory.**
2. **Only simple calculators are allowed.**
3. **Figures to the right indicate full marks.**

(Q1) Solve any 2 of the following **(15)**

(a) (i)The simple interest on a certain amount is Rs 8000 with 10% rate of interest for 4 years . Find the amount.
(ii)Find the compound interest on amount of Rs. 24000 with 5% rate of interest for 5 years. Also find total amount

(b) A T.V. set is purchased for Rs. 80000 with down payment of Rs.10000. The remaining amount is to be repaid as EMI in 6 months.If interest charged is 2% per month , find the amount of EMI using (i)Flat interest rate method and (ii) reducing balance method

(c) (i)Find the **accumulated** value **of an immediate annuity of Rs.12000 after 3 years with 8% rate of interest.**
(ii)Find the present value of an immediate annuity of Rs. 20000p.a. for 3 years with interest of 8% p.a.

(Q2) Solve any 2 of the following **(15)**

(a) **(i)If matrix** $P=\begin{bmatrix}-3 & 2\\ 1 & 2\end{bmatrix}$, $Q=\begin{bmatrix}-4 & 1\\ 4 & -5\end{bmatrix}$, $R=\begin{bmatrix}1 & -2\\ 3 & 3\end{bmatrix}$ **then find matrix X such that**
$3P-3Q+R=4X$
(ii) Find inverse of matrix $A=\begin{bmatrix}2 & -3\\ 1 & -2\end{bmatrix}$

(b) **Solve following equations by Cramer's Rule**
$2x-3y+z=3$, $3x+y-2z=8$, $x-2y-3z=5$

(c) **If Technology matrix of two industries is** $A=\begin{bmatrix}0.5 & 0.3\\ 0.2 & 0.6\end{bmatrix}$, **if final demands are 500 tones and 800 tones , find the total output.**

(Q3) Solve any 2 of the following **(15)**

Find dy/dx of the following

(a) (i) $y=6x^5-5x^6+20\log x-20e^x+20\log 20$

(ii) $y=(2x+4x^5)(10\log x-4\sqrt{x})$

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(b) Find the values of x for which the following function is increasing and decreasing

(i) $f(x) = 5x - 4x^2 + x^3$, ***where x is output***

(ii) $f(x) = 2x^2 - 3x + 7$

(c) Find maxima and minima of the following function . Also find maximum and minimum value of the function

(i)$f(x) = 2x^3 - 21x^2 + 36x - 20$

Solve any 2 of the following **(15)**

Q(4)

(a) The total cost function is C=20 $- 2x \; + x^2$ and total demand function is given by p = 30 $- x$, find Total Revenue , Marginal Revenue, total profit, Average profit and marginal profit at x= 10 units

(b) A company manufactures product for which demand function is p = $100 + 4x^2 + 5x$. Total cost function is $C = 76 + x$. Find the value of x at Break-even point (there is no profit no loss.) Also find Total revenue function.

(c) (i)Explain linear function with example

(ii)Explain equilibrium point.

Find value of x at equilibrium , if demand function and supply functions are , $p = -x + 50$ and $p = -5x + 400$

Solve any 2 of the following

Q(5) **(15)**

(a) 4 cards are selected from a pack of 52 playing cards randomly. Find the possible number of selections if the 4 cards are such that

(i) 2 spade and 2 Diamond cards are selected

(ii) One card of each type is selected

(iii) All red cards are selected

(iv) Find the total number of ways in which any 4 students out of 10 students can be arranged for a photograph

(b) Construct forward difference table for the function $f(x) = x^3 + 3x + 1$, where x takes values from 0 to 5 with increments 0f 1 (0,1,2,3,4,5)

(c) **From the following values of** ***x and $f(x)$, find the degree of $f(x)$.***

X :	0	1	2	3	4	5
$F(x)$:	7	8	15	34	71	132

Also find $f(6), f(7)$
