

15/11/19

VCD FYBMS MATHS SEM II ATKT EXAM 75 MARKS 2^{1/2} HOURS

1 attempt both the sub-part A and B.

2. Figure to the right indicate full marks.

3. Use of non-programmable calculator is allowed.

4. Graph papers will be provided on request.

Q.1) Attempt Both Sup-part (A) and(B):

A) Write the appropriate answer (Answer any eight)

(8)

1. Given principal = Rs 1500 and number of year = 3, interest = Rs 225 then the rate of simple interest will be

a) 3% b) 4% c) 5% d) 6%

2. Number of ways in which three boys and 4 can be arranged in a row show that all three boys are together are

a) $3! \times 4!$ b) $5! \times 3!$ c) $7!$ d) None of these

3) for matrix multiplication the number of column of first matrix should be _____ the number of rows of second matrix

a) less than b) Equal c) More than d) Square of

4) the Newton's forward differential equation formula what is $u =$ _____

a) $u = (x - x_0)/h$ b) $u = (x - x_n)/h$ c) $u = (x - x^2)/h$ d) $u = (x - h)/h$

5) The point at which profit is zero is called the _____

a) Zero point b) break even point c) odd even. d) nominal Point

6) the input output analysis was developed by

a) Leontief b) Bernouli c) Newton's d) none of these.

7) the difference of a successive value of Y where Y is a function of equal space equally space value of x are called

a) Finite difference b) Forward difference
c) Absolute difference d) Positive difference

8) Newton's interpolation formula is applied using

a) Forward difference b) backward difference c) both (a) and (b) d) none of these

9) Derivative of log of x with respect to X is

a) $1/X$ b) 1 c) 0 d) none of these

10) for a function Y equal to f of x be minimum at a certain point the following is satisfied

- a) $dy/dx = 0$ b) $d^2y/dx^2 > 0$ c) both (a) and (b) d) None of these

B) State whether the following statements true or false (ANY 7)

1. If the payment of annuity are all equal and are made over successive period of time there it is uniform annuity
2. The future value of an amount is always greater than present value.
3. Price is a decreasing function of a demand.
4. If the total revenue is Rs 100 at $D = 4$, the average revenue is Rs 25.
5. The sum of 2- identity matrix is an identity matrix.
6. The value of determinant and its transpose are same.
7. The rate of change of supply with respect to price is positive, this means that the supply will decrease if the price increase and will increase if price decreases.
8. A function f has a maximum and a minimum value at a stationary point where the score curve Y equal to $F(X)$ has a horizontal tangent.
9. If $F(X)$ is a polynomial function of degree 3, then $\Delta^3 f(x)$ is a constant.
10. $\Delta \nabla f(x) = (\Delta + \nabla) f(x)$

Q2. Attempt either (A) or (B):

2AP) Find the amount at the end of 1 year of annuity of Rs. 500 payable quarterly, rate of interest being 16%p.a. (8)

Q) In how many ways can the letters of the word **LOGARITHM** be rearranged? In How many of these rearrangement is the first letter a consonant and the last a vowel? (7)

OR
2B) P) Find the equilibrium quantity and equilibrium price in the following cases: (8)

- a) Given supply and demand equation $p = \frac{2x}{100}$, $p = \frac{8x}{100} + 12$.
- b) Given supply and demand equation of a product are $X_s = 4p + 4$ and $X_D = 100 - 8p$.

Q) A person deposits in a financial institution Rs. 15,000 at the end of each for 3 years. (7)
what is the accumulated amount at the end of 3 year taking interest compounded at 12% p.a?

Q3. Attempt either (A) or (B):

3A)P) If $A = \begin{bmatrix} 3 & 7 \\ 1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 5 \\ -1 & 0 \end{bmatrix}$, Find i) $(A+B)$ $(A-B)$ ii) $A^2 + B^2$ (8)

Q) Solve by Cramer's Rule :

1. $5x + 3z - 2y = 9$
2. $3x + 4y + 2z = 10$
3. $x + y + z = 2$

OR

3B)P) Find the inverse of Matrix A, Where $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ (8)

Q) If $A = \begin{bmatrix} 3 & 2 \\ 12 & 8 \end{bmatrix}$, $B = \begin{bmatrix} 3 & x \\ y & -6 \end{bmatrix}$, If $AB = 0$, find the value of x and y. (7)

Q4. Attempt either (A) or (B):

4A)P) Find the derivative of the following function : (8)

a) find $\frac{dy}{dx}$, where $y = \log(x + \sqrt{2x^2 - 3x + 4})$

b) find $\frac{dy}{dx}$, where $y = x - \sqrt{x}/3 + \sqrt{x}$

Q) For a function $f(x)$, it is known that $f(0) = -2$, $f(1) = 0$, $f(3) = 16$ and $f(4) = 30$. (7)

Assuming fourth difference to be zero, estimate $f(2)$.

4)B)P) A manufacturer can sell x items OR at a price of Rs. $(330 - x)$ each. (8)

Total cost of production \times item is Rs. $(x^2 + 10x + 12)$ find x for which the profit is maximum.

Q) Prepare forward difference table for the function given by (7)
Show that the function $f(x)$ is polynomial of degree 2. Also find $f(11)$

X	1	3	5	7	9
F(x)	0	8	24	48	80

Q 5. Attempt either (A) or (B):

5 A)P) Mrs Ranade wants accumulated profit a sum of Rs. 1,50,000 at the end of 3 year

At 6% p.a Calculate EMI by using reducing balance method. (8)

Q) A manufacturer can sell x items per month at a price $= 300 - 2x$. the cost of (7)
production is given by $C = 2x + 1000$. find the average profit and the marginal profit when the output $x = 10$.

OR

5) B) Attempt (Any three) (15)

1. Write note on linear function, exponential function and logarithmic function.
2. Explain the application of Derivatives in business management.
3. Type of matrices with examples.
4. Write difference between compound interest and simple interest.
5. Type of annuity.