SHRI S. H. KELKAR COLLEGE OF ARTS, COMMERCE & SCIENCE, DEVGAD
BACHELOR OF MANAGEMENT STUDIES (BMS) SEM-II EXTERNAL EXAMINATION
April, 2023.

SUB-BUSSINESS MATHEMATICS **Class:- FYBMS**
TIME: **DURATION: 2.5 hrs.**
Date:- **MAX. MARKS:- 75**

Note: 1) All Questions carry equal marks of 15 each. 2) Use of Non-Programmable Calculators is allowed.
3) Figures to the right indicate full marks. 4) All questions are compulsory.

Q .1 A) Select and write the most appropriate correct answer from the from the given alternatives for each sub-question . **[8]**

Q1. If all the elements of a square matrix placed above its diagonal elements are zero, then it is called as matrix.

a) Upper b) Lower c) Lower triangular d) Upper triangular

Q2. An annuity in which not all the payments are equal_____ annuity

a) variable b) level c) certain d) fixed

Q3. The matrix having equal number of columns and rows are called as _____matrix.

a)Zero b)Equal c)Normal d)Square

Q4. An annuity is

a)An annual payment of interest b)A sequence of payments made at successive time periods

c) payments passed in the annual general meeting d)None of the above

Q5. Derivative of constant function is

a)1 b)0 c)3 d)5

Q6 . If $f'(x) > 0$ then the function f(x) is

a)increasing b)decreasing c)both d) non of these.

Q7. If f(x) is a polynomial of degree n , then $\Delta^n f(x)$ is (a non zero)constant and all thr forward difference of order grater than n are each equal to _____ .

a)1 b)2 c)0 d)0

Q8. Cramer's rule dose not work when D =

a)0 b)1 c)-1 d)None of the above

Q.1 B) State whether true or false. **[7]**

1] The matrices having non zero determinant value are called as singular matrices.

2] The derivative of e^x is e^x.

3] Simple interest is the amount paid for the using principal amount.

4] The matrix with order 3 ×2 has 25 elements.

5] The value of variable x is called argument.

6] The matrix having all entries zero are called as null matrix.

7] Derivatives is the rate of change of depended variable with respect to independent variable.

Q.2Attempt any one of the following questions **[15]**

[a] i) Find the maturity amount of a 2-year fixed deposit of Rs. 3,30,000 at 6% p.a. if the interest is compounded (a) annually (b) semi-annually (c) continuously. Given that $e^{0.12} = 1.127$.

ii) A particular sum of money amounts to Rs. 7,69,824 in 2 years and Rs. 8,31,409.92 in 3 years. Find the sum and the compound interest rate.

[b] i) If y is the quantity and x the price of a commodity, the demand and supply curves are given by the linear equations 2x+y-600=0 and 5x – y – 100 = 0 respectively. Find the equilibrium price and the corresponding quantity.

ii) A manager has 12 persons working under her & she is excepted to award 3 prizes. To the persons whom she ranks are the top 3 achievers in the previous year. Non of the 3 ranks his to be shared! How many choices does the manager have?

Q.3 Attempt any one of the following questions [15]

[a] i) If $A = \begin{bmatrix} 3 & 0 & -1 \\ 1 & 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 1 & 1 \\ 2 & 0 & 2 \end{bmatrix}$, $C = \begin{bmatrix} 3 & 2 & -1 \\ 0 & 1 & 5 \end{bmatrix}$ Find the matrix X such that

A + 2B-3C+X=O .

ii) Find the p and q such that $p\begin{bmatrix} 1 & -1 \\ 1 & -2 \\ 3 & -3 \end{bmatrix} - q\begin{bmatrix} -2 & 2 \\ -3 & 3 \\ -4 & 4 \end{bmatrix} = \begin{bmatrix} -1 & 1 \\ -3 & 0 \\ 1 & -1 \end{bmatrix}$.

[b] i) Slove the equations by Cramers Rule , 2x+3y= 7, 4x-5y= 3.

ii) For an input. output model with 2 industries , $A = \begin{bmatrix} 0.5 & 0.5 \\ 0.5 & 0.1 \end{bmatrix}$ is the technological matrix. Write down the equations expressing the total outputs X_1 and X_2 in terms of the final demands by the consumers d_1 and d_2.

Q.4 Attempt any one of the following questions [15]

[a] i)A) find $\frac{dy}{dx}$, where $y = 30x^{20} + 20(30^x) + 30\log 20 - \frac{20}{x^{30}}$.

B) find $\frac{dy}{dx}$, where $y = x^2e^x$

ii) A) find $\frac{dy}{dx}$, where $y = \frac{x^2-3x+5}{2x+1}$.

B) find $\frac{dy}{dx}$, where $y = (x+3)(x^2-1)$

[b] i)When the price of a good is p , its demand D and supply S are given by $D = \frac{8p}{p-2}$ and $S = p^2$ Find the rate change of demand and the rate of change of supply at the equilibrium price .

ii) Find the value of x, for which the are increasing and decreasing. $f(x) = x^2 - 4x + 7$.

Q.5 Attempt any one of the following questions [15]

[a] i) Prepare the forward differencing table for the function

$f(x) = x^3 + 3x + 1, x = 0(1)5.$

ii) Find the f(4),f(5) and f(6), if f(0) =-3 , f(1)=6 , f(2)= 8 and f(3)= 2 ,where the third differences are given to be constant.

[b] i) Find the polynomial f(x) , whose graph passes through the points (0 , -1) (1, 1) (2,1) and (3 ,-2).

ii) Find the f(70) using Newton's forward difference interpolation formula

X	:	19	39	59	79	99
F(x)	:	41	103	168	218	235 .