

NGM COLLEGE (AUTONOMOUS) POLLACHI

END-OF-SEMESTER EXAMINATIONS: DECEMBER- 2022

B.COM-Business Process Services

MAXIMUM MARKS: 50

I SEMESTER

TIME: 3 HOURS

PART - III

BUSINESS MATHEMATICS

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

- Find the effective rate of interest if an amount of Rs. 30,000 deposited in a bank. for one year at the rate of 10% p.a. compounded semi annually.  
(a) 10.05% (b) 10.10% (c) 10.20% (d) 10.25%
- The sum of five terms of AP is 75, then the 3rd term is \_\_\_\_\_.  
(a) 20 (b) 30 (c) 15 (d) None of these
- The number of rows may be any integer but the number of columns is always 1. Then the matrix is \_\_\_\_\_.  
(a) Column Matrix (b) Row Matrix  
(c) Rectangular Matrix (d) Square Matrix
- \_\_\_\_\_ is the rate of change of one variable with respect to another variable.  
(a) Calculas (b) Differentiation (c) Algebra (d) Matrix
- \_\_\_\_\_ is called the reverse process of differentiation.  
(a) Integration (b) Calculas (c) Differentiation (d) Algebra

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

- Write the formula to find out compound interest.
- Explain a Universal set.
- Define Matrix.
- What is differentiation used for?
- Which function is known as anti-derivatives functions?

SECTION – B (5 X 3 = 15 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(Qn. No. 11 to 15 Questions for Short Answers with internal choices)

(K3)

- a) Find the interest on Rs. 1460 at 10% from 5<sup>th</sup> February, 2018 to 25<sup>th</sup> April 2018.

(OR)

- b) What is the present value of Rs. 1,000 due in 3 years at 6% compounded quaterly.

- a) Let A and B be two finite sets such that  $n(A) = 20$ ,  $n(B) = 28$  and  $n(A \cup B) = 36$ , find  $n(A \cap B)$ .

(OR)

- b) Find 8<sup>th</sup> term of  $2n^2 - 1$

(CONTD....2)

13. a) Solve  $2x^2 + 3x - 1 = 0$

(OR)

b) What is the order of the matrix given below:

$$A = \begin{bmatrix} 8 & 1 & 7 & 5 & 2 \\ 1 & 3 & 4 & 7 & 6 \\ 1 & 0 & 5 & 2 & 1 \end{bmatrix}$$

Write the elements  $a_{12}$ ,  $a_{21}$ ,  $a_{32}$ ,  $a_{23}$ ,  $a_{34}$ 

14. a) Differentiate the following functions:

(i)  $x^5$  (ii)  $x^{3/2}$

(OR)

b) State the rules for differentiation.

15. a) What is the value of  $\int 8x^3 dx$ .

(OR)

b) Integrate the following function of x. (i)  $x^8$  (ii)  $1/\sqrt{x}$ **SECTION – C (5 X 5 = 25 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.****(Qn. No. 16 to 20 Questions for Long Answers with internal choices)****(K4 (Or) K5)**

16. a) Find the present worth of Rs.9261 due 3 years at 5% per annum compounded early

(OR)

b) What is the present value of an annuity consisting of annual payments of Rs. 500 for 20 years? Assume that the rate of interest is 5% per annum.

17. a) Write the following sets by listing all its elements through roaster method.

(i) A is the set whose elements are first five letters of alphabet.

(ii) B is the set of all odd integers.

(iii) X is the set of all two digit positive numbers which are divisible by 15.

(OR)

b) Which term of the A.P. 49,44,39, ..... is 9?

18. a) Evaluate  $\begin{vmatrix} 102 & 18 & 36 \\ 1 & 3 & 4 \\ 17 & 3 & 6 \end{vmatrix}$

(OR)

b) Prove the theorem: If A and B be two non-singular matrices of the same order n, then  $(AB)^{-1} = B^{-1} A^{-1}$ 19. a) A firms total cost curve is given by  $TC=Q^3- 4Q^2+12Q$ 

(i) Find an expression for AC in terms of Q

(ii) Find an expression for MC in terms of Q

(iii) When does  $AC=MC$ ?(iv) When does the slope of  $AC=0$ ?

(v) Plot MC and AC curves and comment on the economic significance of their relationship.

(OR)

b) If the (inverse) Demand equation is  $P = 200 - 40\ln(Q+1)$ . Calculate the price elasticity of demand when  $Q = 20$ .

20. a)  $\int_0^1 \frac{1}{1+x^2} dx$

(OR)

b) Find the value of  $\int 2x \cos(x^2 - 5) dx$