(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023-24 ONLY)

SUBJECT CODE 23UBP3A1

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : NOVEMBER – 2024

B.Com.-B.P.S. MAXIMUM MARKS: 75

III SEMESTER TIME : 3 HOURS

PART – III

23UBP3A1-BUSINESS MATHEMATICS

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. For any two sets A and B _____

   a) (AUB)'= A'UB' c) (AUB)'= (A ∩ B) '

   b) (A ∩ B) ' = A' ∩ B' d) (AUB)'= A' ∩ B'

2. Which of the following is the formula for the sum of the first n terms of an arithmetic series?

   a) Sn=2n×(a+l) c) Sn=2n×(a+b)

   b) Sn=(n/2)×(2a+(n−1)d) d) Sn=n×2a+d

3. The simple interest on the sum of Rs.6000/- at 10% per annum for 3 years is_____

   a) Rs.1900 c) Rs.2000

   b) Rs.1800 d) Rs.1750

4. The determinant of the matrix A = $\begin{pmatrix} 2 & 4 \\ 1 & 3 \end{pmatrix}$ is

   a) -2 b) -5 c) 5 d) 2

5. Which of the following is NOT a constant?

   a) X^2 b) π c) 9 d) -5

6. Find the sum of first 100 natural numbers?
7. If the fourth and seventh terms of an arithmetic progression are 3 and 36 respectively, find then the arithmetic progression.
8. Find the compound interest on Rs.20,000 for 5 years at 20% per annum is …….
9. If a matrix A is multiplied by its inverse, what is the result?
10. Find the second derivative of $y = x^5$.

(CONTD …. 2)

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) If U = {1, 2, 3, ..., 10} is the universal set, A = {2, 4, 6, 8}, and B = {3, 6, 9}, find A', B', and A' ∩ B' , $A \cup A'$

(OR)

b) If A= {1,3} and B={5,6,7} then find AxB, BxA, AxA, BxB

12. a) A bill of Rs. 10,000 is due in 6 months. Find the present worth and true discount if the rate of interest is 10% per annum.

(OR)

b) A banker discounts a bill for Rs. 960 which is due after 6 months at the rate of 10% per annum. Find the true discount, banker's discount, and banker's gain.

13. a) A man borrows Rs.1200 at the total interest of Rs. 168. He repays the entire amount in 12 instalments , each instalment being less than the preceding one by Rs. 20. Find the first installment.

(OR)

b) Find the number of terms in the geometric series 0.03+ 0.06+ 0.12 +….+1.92

14. a) If 10A-50I=0 and A= $\begin{pmatrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{pmatrix}$, *find* A^{-1}

(OR)

b) If $\begin{pmatrix} 4 \\ 1 \\ 3 \end{pmatrix} (x \quad y \quad z) = \begin{pmatrix} -4 & 8 & 4 \\ -1 & 2 & 1 \\ -3 & 6 & 3 \end{pmatrix}$, find $(x \quad y \quad z)$.

15. a) Find $\frac{dy}{dx}$ if (i). $x^2+ y^2=1$ (ii). $xy=c^2$

(OR)

b) Find $\frac{dy}{dx}$ if $x=4t$ and $y=2t^2$

(CONTD …. 3)

ETHICAL PAPER

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K4/K5)

16. a) If A={2,3,6}, B={1,5,10}, C= {3,5,6} and D= {1,2,10}then verify that

(A ∩ C)x (B∩ D) = (AxB) ∩ (CxD)

(OR)

b) All the 3200 students of a college in a city know atleast one of the three languages-Tamil, Telugu and Malayalam. 2400 know Tamil, 1700 know Telugu, 800 know Malayalam, 1000 know Tamil and Telugu, 500 know Tamil and Malayalam, 300 know Telugu and Malayalam and only 100 know all those three languages. Draw a Venn diagram and find the number of students

(i). who know Tamil and Telugu but not Malayalam
(ii). who know only Malayalam
(iii). Who know only one of the three languages and
(iii). Who know none of these languages

17. a) Find the four numbers forming a geometric progression if the first number exceeds the second by 36 and the third number is greater than the fourth by 4.

(OR)

b) A man borrows Rs. 1200 at the total interest of Rs.168. He repays the entire amount in 12 instalments each instalment being less than the preceding one by Rs. 20. Find the first instalment.

18. a) A sum of money invested at compound interest amounts to Rs. 21,632.00 in two years and to Rs. 22,497.28 in three years. Find the rate of interest and the sum invested.

(OR)

b) Find the banker's gain on a bill of Rs.2000/- for 4.5 months at 4% per annum.

19 a A salesman has the following records of sales during three months for three items A, B and C which have different rates of commission as given below:

Month	Sales in units			Total Commission (Rs)
	A	B	C	
January	90	100	20	800
February	130	50	40	900
March	60	100	30	850

Find the rates of commission on items A,B and C.

(OR)

b) Show that the matrix A= $\begin{pmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$ satisfies the equation $A^3-6A^2+9A-4I=0$. Hence deduce the value of A^{-1}.

20. a) If $y= ax^2 + bx$ then show that $x^2\frac{d^2y}{dx^2} - 2x\frac{dy}{dx} + 2y = 0$

(OR)

b) Compute

$$\int_0^5 x\, e^{-\frac{x}{2}}\, dx$$

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