B.Com(Hons) DEGREE EXAMINATION,NOVEMBER 2019
II Year III Semester
Business Mathematics

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer **ALL** the questions

1. Let U={a,b,c,d,e,f,g} and let A={a,b,c,d,e}, B={a,c,e,g} and C={b,e,f,g}. Find (i) A'-B (ii) (A-B')'
2. Let A= {-3,-1, 0, 1,3} and let the function g:A $\rightarrow$ R be defined by the formula g (x)=x^2 +1. Find the range of g.
3. If $\frac{a}{3}=\frac{b}{4}=\frac{c}{7}$, show that $\frac{a+b+c}{c} = 2$
4. Find the number of ways that 4 letters may be mailed if there are 2 mail boxes.
5. Simplify $(\sqrt{2+1})^5 - (\sqrt{2-1})^5$
6. Fill in the blanks:

Function	Derivatives
e^x	——
——	Cos^x
Sec^x	——

7. Show that f (x) = x^3 - 9x^2 +30x +5 has neither a maximum nor a minimum.
8. Find the inverse of the matrices $\begin{bmatrix} 2 & 0 \\ 1 & -3 \end{bmatrix}$
9. The sum of certain number of terms in A.P is 5500. The first and the last terms are 100 and 1000. Find the number of terms.
10. The annual rent of a freehold estate is Rs.5000. What is its current value if the compound interest rate is 5% p.a.?

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

11. A market research group conducted a survey of 1000 consumers and reported that 720 consumers liked the product A and 450 consumers liked the product B. What is the least number that must have liked both products?
12. Let the function f : R $\rightarrow$ R be defined by

$$f(x) = \left\{ \begin{array}{ccc} 3x-1 & if & x > 3 \\ x^2-2 & if & -2 \leq x \leq 3 \\ 2x+3 & if & x < -2 \end{array} \right\}$$

find (i) f(2) , ii) f(4), iii) f(-1), iv) f(-3)

13. 14 men work 9 hours a day to plant 945 mango plants in three days. Apply the principle of variation to find how many men working in 8 hours a day can plant 3000 mango plants in 15 days.
14. The ratio of prices of two cow was 23:16. Two years later when the price of the first had risen by Rs. 477 and that of the second by 10%, the ratio of their prices became 20:11. Find the original prices.
15. In how many ways can 8 women from a committee if at least 3 women are to be in the committee.
16. Find $\frac{\mathrm{d}y}{\mathrm{d}x}$ when $x^3 + y^3 = 3axy$.
17. For the matrices $A = \begin{bmatrix} 2 & 3 \\ 5 & -4 \\ -7 & 0 \end{bmatrix}$ $B = \begin{bmatrix} 1 & -2 \\ 6 & 8 \\ 9 & -3 \end{bmatrix}$ $C = \begin{bmatrix} -1 & 5 \\ 3 & -8 \\ 4 & -9 \end{bmatrix}$ find (i) 4A+2B (ii) 3A-B-2C
18. Differentiate $a^x x^x$

Section C $(2 \times 15 = 30)$ Marks

PART - A - Case Study - Compulsory Question

19. In a survey of 1000 customers the number of people that buy the various grades of coffee seeds were found to be as follows:

'A' grade only	180
'A' grade and 'C' grade	80
'C' grade	480
'A' grade but not 'B' grade	230
'A' grade	260
'C' grade and 'B' grade	80
None of the three grades	240

(a.) How many buy 'B' grade coffee seeds only?
(b.) How many buy 'C' grade if and only if they do not buy 'B' grade?
(c.) How many buy the 'C' and 'B' grades but not the 'A' grade?

PART - B

Answer any **ONE** questions

20. Find the maximum and minimum values of $\frac{1}{2}$ $x^4 - x^2 + 1$
21. Find the compound interest and amount for Rs. 5000 for 3 years at 8% per annum when
(a.) the interest is payable annually
(b.) the interest is payable half yearly
(c.) the interest is payable quarterly

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