B.Com(PA) DEGREE EXAMINATION,NOVEMBER 2019
I Year I Semester
Business Mathematics

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

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

Answer any **TEN** questions

1. If A = {1,2,3,4,5}
   B = { 4,5,7,9}
   What is A∪B?
2. Given A = {1,2,3} and B = {p,q,r,s}. R={(1,r),(2,q),(3,s),(s,s)} a function?
3. There are 5 trains from Chennai to Delhi and back to Chennai. In how many ways can a person go from Chennai to Delhi and return in a different train?
4. Given : 2x + 9y : 3x + 4y = 3 : 4. Find the ratio of x to y.
5. $\frac{x}{y+z} = \frac{y}{z+x} = \frac{z}{x+y}$, then prove that if x + y + z ≠ 0 then each ratio = $\frac{1}{2}$
6. The rate of monthly salary of a person increases annually in AP. It is known that he was drawing? 200 a month during the 11^{th} year of service and? 380 during the 29^{th} year. Find the starting salary and the rate of annual increments.
7. If a and b are the 1^{st} and 20^{th} terms of a HP write down the 15^{th} term.
8. Differentiate the following with respect to x: $(\mathbf{x}+\frac{\mathbf{1}}{\mathbf{x}})$
9. Differentiate the following with respect to x: $7x^3 + 4x^2$ - 3x +2
10. Find the simple interest on Rs. 5,000 at 10% for years. Find out the amount.
11. Find the amount of an annuity of Rs. 2,000 per annum for 10 years reckoning compound interest at 10% per annum.
12. Find the true discount and the present worth of a bill for Rs. 1,660 due in 9 months at 5% per annum.

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

Answer any **FIVE** questions

13. If $4nC_2 = (n + 2) C_3$ find n
14. If $A = \begin{bmatrix} \mathbf{2} & \mathbf{-1} & \mathbf{0} \\ \mathbf{3} & \mathbf{2} & \mathbf{6} \end{bmatrix}$ and $B = \begin{bmatrix} \mathbf{4} & \mathbf{7} & \mathbf{1} \\ \mathbf{-2} & \mathbf{3} & \mathbf{6} \end{bmatrix}$ Find 2A + 3B.

15. Solve by matrix method: $\mathbf{2x+4y+z=5;;x+y+z=6;;2x+3y+z=6}$
16. In a city three daily newspapers A, B, C are published; 42% of the people in that city read A; 51% read B; 68% read C; 30% read both A and B; 28% read B and C; 36% read both A and C; 8% do not read any of the three newspapers. Find the percentage of persons who read all the three papers?
17. Find the sum of all integers between 200 and 500 which are divisible by 7.
18. If $\frac{\mathbf{a}}{\mathbf{3}} = \frac{\mathbf{b}}{\mathbf{4}} = \frac{\mathbf{c}}{\mathbf{7}}$. Show that $\frac{\mathbf{a+b+c}}{\mathbf{c}} = 2$
19. Find the present value of an annuity of Rs. 5,000 per annum for 12 years, the interest being 4% per annum compounded annually.

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

Answer any **TWO** questions

20. In how many different ways can the letters of the word 'POSSESSIVE' be arranged?

    (i.) In how many of these will the S's come together?

    (ii.) In how many of these will the relative positions of vowels and consonents remain unchanged?

21. $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 3 \\ 3 & 3 & 5 \end{bmatrix}$ B $= \begin{bmatrix} 4 & 1 & 2 \\ 3 & 2 & 5 \\ 1 & 2 & 0 \end{bmatrix}$ $C = \begin{bmatrix} 0 & 1 & 3 \\ 4 & 1 & -2 \\ 3 & 1 & 3 \end{bmatrix}$

    Solve the equation 2 (x + B) = 3 (x + A) + C
22. A person is appointed on a basic salary of Rs. 1,000 a month and gets an increment of Rs.50 every year. He contributes 10% of his salary to provident fund. What will be the total contribution to provident fund during his 25 years of service?
23. Find the position of the point of inflexion of the curve y = $2x^3$ - $5x^2$ - 4x + 1

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