Bcom(PA) DEGREE EXAMINATION,APRIL 2020
I Year I Semester
Business Mathematics

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

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

Answer any **TEN** questions

1. There are 30 students in a class. Among them, 8 students are learning both English and French. A total of 18 students are learning English. If every student is learning at least one language, how many students are learning French in total?
2. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?
3. Solve the quadratic equation $2x^2 + 4x–1 = 0$.
4. Solve $2x^2 + 2x - 3 = 0$.
5. Find three numbers in A.P. such that their sum is 27 and their product is 504.
6. A shopkeeper sells mangoes for 50 rupees per kg and buys them at a wholesale price of 30 rupees per kg. What is the ratio of his profit to the cost price per kg?
7. If simple interest on Rs. 1200 in 3 years amount to Rs. 18, find the rate of interest.
8. How much should a person invest at 5% p.a. so to get an immediate annuity of Rs. 100 per annum for 10years?
9. Differentiate with respect to x....

   $7x^3 + 4x^2 - 3x + 2$
10. Find calculus $f(x) = 6x^3 - 9x + 4$.
11. Find the interest on Rs. 1000/- for 10 years at 4% pa.
12. Expand $(1 + 4x)^5$

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

Answer any **FIVE** questions

13. In a chess competition involving some men and women, every player needs to play exactly one game with every other player. It was found that in 45 games, both the players were women and in 190 games, both players were men. What is the number of games in which one person was a man and other person was a woman?

14. Solve the following quadratic equations:

    $3x^2 - 4x - 4 = 0$

15. A person borrows from his friend Rs.484 to be repaid in instalments forming geometric progression. If the first instalment is Rs. 4 and the last instalment is Rs. 324, find the number of instalments.

16. A money lender borrows money at 4% per annum and pays the interest at the end of the year. He lends it at 65 per annum half-yearly and receives the interest at the end of the year. In this way, he gains Rs.104.50 in a year. How much money does he borrow?

17. Differentiate the following: $y = \dfrac{2x-3}{3x+4}$

18. An electrician charges a base fee of Rs. 70 plus Rs.50 for each hour of work. Create a table that shows the amount the electrician charges for 1,2,3, and 4 hours of work. Let x represent the number of hours and y represent the amount charged for x hours. Is this relation a function?

19. The ratio componded of 4 : 9, the duplicate ratio of 3 : 4, the triplicate ratio of 2 : 3, and 9 : 7 is ?

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

Answer any **TWO** questions

20. $f : x \to$ highest prime factor of x.

    i. Find the range of f when the domain is 12,13,14,15,16,17.
    ii. State a domain of five integers for which the range is 3.
    iii.A set of positive integers is called S. what can be said about these integers if $f(S) = S$?.

21. Suppose you wish to retire forty years from today. You determine that you need Rs. 50,000 per year once you retire, with the first retirement funds withdrawn one year from the day you retire. You estimate that you will earn 6% per year on your retirement funds and that you will need funds up to and including your 25th birthday after retirement.

    a)How much must you deposit in an account today so that you have enough funds for retirement?

    b)How much must you deposit each year in an account, starting one year from today, so that you have enough funds for retirement?

22. Using binomial theorm, find the value of

    i) $(99)^4$ ii) $(98)^5$ iii) $(1.02)^6$ Correct to 5 decimal points.

23. Differentiate the following: $y = \dfrac{x^5 - x + 2}{x^3 + 7}$

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