TB245744J

Reg. No :.....

Name :.....

BACHELOR'S DEGREE (C.B.C.S) EXAMINATION, NOVEMBER 2024

2022 ADMISSIONS REGULAR

SEMESTER V - OPEN COURSE

MT5D01AB18 - Applicable Mathematics

Time : 3 Hours **Maximum Marks : 80**

Part A

I. Answer any Ten questions. Each question carries 2 marks **(10x2=20)**

1. What is a composite number? Give an example.
2. Evaluate $2^{\log_2 5}$
3. Solve $x^2 - 5x + 6 = 0$
4. If a pair of fair dice is rolled, what is the probability of rolling a sum of four?
5. Write the derivative of $(1-x)\sqrt{1+x}$ with respesct to x.
6. Compute the integral of 5sec 4x tan 4x with respect to x.
7. Express 18 hours as a percent of 3 days.
8. The ratio between two numbers is 3:4. If their LCM is 180, discover the numbers.
9. Two numbers are in the ratio 4:5. If the sum of the numbers is 135, find the numbers.
10. Find the perimeter and area of a square whose side is 63 mm.
11. The speed of a goods train is 4m/sec. What is its speed in km/hr?
12. How much would a sum of Rs. 16000 amount to in 2 years time at 10 % per annum compound interest, interest being payable half-yearly?

Part B

II. Answer any Six questions. Each question carries 5 marks **(6x5=30)**

13. Calculate how many three digit numbers divisible by 5 can be formed using any of the digits from 0 to 9 such that none of the digits can be repeated.
14. Sketch the graph of the line $y = -3x + 1$
15. Compute $\int x^3 e^{-2x} dx.$
16. Calculate the derivative of $\frac{1}{\sqrt{3+2x}}$ with respect to x.
17. A man spends 92% of his monthly income. If he saves Rs 220 per month, what is his monthly income?
18. If $a+b+c=6$ and $ab+bc+ca=11$, find the value of $a^3+b^3+c^3-3abc$
19. A gun is fired at a distance of 3.32 km away from Rohit. He hears the sound 10 seconds later. Calculate the speed of the sound.
20. Compute the area of a rectangular plot, one side of which is 48 cm and its diagonal 50 cm.
21. Somari sweeps 600m long railway platform in $2\frac{1}{2}$ hours. His wife Imarati sweeps $\frac{2}{3}$ rd of the same platform in $1\frac{1}{2}$ hours. Who sweeps more speedily?

Part C

III. Answer any Two questions. Each question carries 15 marks **(2x15=30)**

22. a) Determine the height of a mountain if the elevation of its top at an unknown distance from the base is 30° and at a distance 10 km further off from the mountain, along the same line, the angle of elevation is 15°.
    b) From the top of a hill, the angles of depression of two consecutive kilometre stones due east are found to be 30° and 45° . Compute the height of the hill.

23. (a)Two balls are drawn from a bag containing 3 white 4 black and 2 red balls. Compute the probability that the balls drawn are
    (i) both white (ii) both black (iii) one white and one red.
    (b) Write the derivative of cos $x^3\sin^2(x^5)$ with respect to x.

24. a) By selling 90 ball pens for Rs. 160 a person loses 20%. Determine how many ball pens should be sold for Rs. 96 so as to have a profit of 20%?
    b) If $25^{x-1} = 5^{2x-1} - 100$, solve x.

25. (a). The length and breadth of a playground are 75 m 20 cm and 34m 80 cm, respectively. Find the cost of leveling it at Rs.1.50 per square metre. How long will a boy take to go three times round the field, if he walks at the rate of 1.5 m/sec? (b). A sum of money doubles itself at compound interest in 15 years. In how many years will it become eight times?