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TB245853K

Reg. No :.....

Name :.....

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

2018, 2019, 2020, 2021 ADMISSIONS SUPPLEMENTARY

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. The sum of two numbers is seven times their difference. If the smaller number is 30, find the other.
2. Evaluate $100^{\frac{-3}{2}}$
3. Solve $12x = -8x^2$
4. Calculate the probability of drawing a black card from a pack of cards?
5. Compute $\frac{d}{dx}\left(\frac{1}{\sqrt{3+2x}}\right)$
6. Compute $\frac{d}{dx}\left(\sqrt[3]{(ax+b)^2}\right)$.
7. Determine whether two numbers can have 14 as their HCF and 204 as their LCM.
8. The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 80, compute the other.
9. Calculate the cube root of -1728.
10. Discuss the change that will happen to the area of a square if its side is (a) doubled (b) halved.
11. 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?
12. The speed of a goods train is 4m/sec. What is its speed in km/hr?

Part B

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

13. a) There are 4 oranges, 5 apples and 6 mangoes in a basket. Calculate the number of ways in which a person can make a selection of fruits among the fruits in the basket? b)Calculate the number of different ways in which the letters of the word 'MATHEMATICS' can be arranged such that the vowels must always come together?
14. Sketch the graph of $y = 5x - 2$
15. Write the integral of sin 2x. cos 3x with respect to x.
16. Evaluate $\frac{d}{dx}\left(\frac{x}{x-\sqrt{x^2-1}}\right)$
17. The selling price of 10 articles is the same as the cost price of 11 articles. Calculate the gain percent.
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. A is thrice as good a workman as B, and is therefore able to finish a piece of work in 60 days less than B. Compute the time required to finish the work if they do it together.

21. Two men undertake to do a piece of work for Rs. 600. One alone could do it in 6 days, the other in 8 days. With the assistance of a boy they finish it in 3 days. How should the money be divided.?

Part C

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

22. a) A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is 60°. When he moves 40 metres away from the bank, he finds the angle of elevation to be 30°. Determine the height of the tree and the width of the river. b) From the top of a building 60 m high the angles of depression of the top and the bottom of a tower are observed to be 30°and 60°. Determine the height of the tower.

23. (a). A ball is drawn from a bag containing 5 white 4 black and 6 red balls. What is the probability that the ball drawn is (i) white (ii) black (iii) red.

    (b). Find $\int e^x \cos x \, dx$.

24. a) Calculate $\dfrac{(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$

    b) Rani's weight is 25% that of Meena's and 40% that of Tara's. Determine what percentage of Tara's weight is Meena's weight?

25. (a). A sum amounts to Rs. 9680 in 2 years and to Rs. 10648 in 3 years compounded annually. Find the sum and the rate of interest per annum. (b). A 5m wide lane was paved with bricks of length 20 cm and width 15 cm. If the rate of the bricks was Rs. 750 per thousand and if bricks worth Rs. 49500 were used for pavements, find the length of the lane.