Reg. No ..... Name **24U577**

UNDERGRADUATE END SEMESTER EXAMINATION - OCTOBER 2024

SEMESTER 5 : MATHEMATICS (OPEN COURSE)

COURSE : **19U5OCMAT1 : APPLICABLE MATHEMATICS**

(For Regular 2022 Admission and Supplementary 2021/2020/2019 Admissions)

Time : Three Hours Max. Marks: 75

PART A

Answer any 10 (2 marks each)

1. The speed of a car is 54km/hr. What is its speed in m/sec?
2. Find $\log_2 128$.
3. Find the square root of 1296.
4. Find the LCM of 72, 84, 126.
5. Which among the following is not a prime : 23, 43, 63, 83?
6. Write in exponential form: $\log_5 625 = 4$.
7. If 15 men can complete a piece of work in 90 days, in how many days will 18 men complete it?
8. Evaluate $\int \frac{1}{x} dx$
9. Evaluate $\int_0^1 e^x dx$
10. Divide 108 into two parts in the ratio 4:5
11. Differentiate xe^{2x}
12. Solve $8x + \frac{21}{4} = 3x + 7$

(2 x 10 = 20)

PART B

Answer any 5 (5 marks each)

13. At a point on the level ground, the angle of elevation of the vertical tower is found to be such that its tangent is 5/12. On walking 192 meters towards the tower, the tangent of the angle of elevation is 3/4. Find the height of the tower.
14. Abhay lent Rs.8000 to his friend for 3 years at the rate of 5% per annum compound interest. What amount would Abhay get after 3 years?
15. Draw the graph of the line 3x+4y=18.
16. Find the greatest number that exactly divides 105, 1001, and 2436.
17. Find $\frac{dy}{dx}$ when $y = \left(\frac{x-5}{2x+1}\right)^3$
18. The length of a rectangle is halved and breadth is tripled. Find the percentage change in the area.
19. Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is:
    (i) 6 (ii) 12 (iii) 7
20. John buys a vehicle for Rs.4700 and spends Rs.800 on its repairs. If he sells the vehicle for Rs.5800, then find his gain percent.

(5 x 5 = 25)

PART C

Answer any 3 (10 marks each)

21. (a) Differentiate $x^2 logx$ with respect to x.
    (b) Find $\int \frac{1}{x(logx)^2}$

22. A committee of 3 is to be formed from 6 boys and 4 girls. In how many ways can this be done so as to include
    (i) no girls
    (ii) exactly 1 girl
    (iii) at least 1 girl

23. (a) A sum of money amounts to Rs.944 in 3 years at simple interest. If the rate of interest is raised by 25%, the sum amounts to Rs.980 during the same period. Find the sum and the rate of interest.
    (b) Ram Singh bought a refrigerator for Rs.4000 on credit. The rate of interest for the first year is 5% and for the second year is 15%. How much will it cost him if he pays the amount after two years?

24. (a)If Rs. 782 be divided into three parts, proportional to 6:8:9, then find the first part, second part, and third part.
    (b)In an election a candidate who gets 84% of the votes is elected by a majority of 476 votes. What is the total number of votes polled?

(10 x 3 = 30)