UNDERGRADUATE END SEMESTER EXAMINATION : OCTOBER 2022
SEMESTER **5: MATHEMATICS (OPEN COURSE)**
COURSE: **19U5OCMAT1: APPLICABLE MATHEMATICS**
(For Regular - 2020 Admission and Supplementary - 2019 Admission)

Time: Three Hours   Max. Marks: 75

PART A
Answer any 10 (2 marks each)

1. Find the HCF of $1365, 1560$.
2. Find the value of $\log_2 64$.
3. Differentiate $e^x \sin x$.
4. Find the average of first 61 natural numbers.
5. $\int_0^2 (9x^2 - 18x + 10) dx.$
6. Find the fourth proportional of the numbers $6, 8$ and 5.
7. Solve $a + b = 5$ and $3a + 2b = 20$.
8. Find the roots of the equation $x^2 + 2x = 15$.
9. How many words can be formed with the word 'EQUATION'?
10. Find the simple interest if Ram deposited an amount of Rs. 5000 at a rate of 5% in 2 years.
11. Find the cube root of 1728.
12. Find the area of the rectangle with length 6cm and breadth 3 cm.

(2 x 10 = 20)

PART B
Answer any 5 (5 marks each)

13. A man bought 13 shirts of Rs.50 each, 15 pants of Rs.60 each and 12 pairs of shoes at Rs.65 a pair. Find the average value of each article ?
14. A train 240m long passes a pale in 24 seconds. How long will it take to pass a platform 650m long?
15. In what time will Rs.1200 amount to Rs.1323 at 5% compound interest?
16. A dice is thrown. What is the probability that the number shown on the dice is not divisible by 3 ?
17. From a point 80 m from the base of a tower, the angle of elevation is 60^0 . How tall is the tower.
18. Solve for 'a' in the equation : $3 \log a + 5 \log a - 6 \log a = \log 64$.
19. In a certain school, the ratio of boys to girls is 7:5. If there are 2400 students in the school, then how many girls are there ?
20. Differentiate (a) $e^x \log \sin x$.
    (b) $\frac{1}{\sqrt{3x-2}}$.

(5 x 5 =25)

PART C
Answer any 3 (10 marks each)

21. (a) Find the value of $4cot^2 45 + \cot 90 + cosec^2 30 - sec^2 60$.
   (b) Draw the graph of the line 4x-y=3.
   (c) If $nC_2 = nC_5$, find n?.

22. (a) Integrate $x\, e^x$ with respect to x.
   (b) In a single throw of a die, what is the probability of getting a number less than 3 ?

23. (a) The LCM of 2 numbers is 2310 and their HCF is 30. If one of the number is 210, find
      the other number.
   (b) Raj bought an AC for Rs.12160 and paid Rs.340 for transportation. Then he sold
      for Rs.12875. Find his profit %.

24. (a) 30 men working 7 hours a day can do a work in 18 days. In how many days will
      21 men working 8 hours a day do the same work ?
   (b) How many paving stones each measuring 2.5 m x 2 m are required to pave a
      rectangular courtyard 30 m long and 16.5 m wide ?

(10 x 3 = 30)

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