Reg. No ..... Name **24U558**

B. Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER 2024

SEMESTER 5 : MATHEMATICS

COURSE : **19U5CRMAT08 : HUMAN RIGHTS AND MATHEMATICS FOR ENVIRONMENTAL STUDIES**

(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. Name a few acts that ensure fundamental rights to the weaker sections of the society.
2. What is biomass energy? How can it be used?
3. What relationship exists between golden ratio and the Newton's method?
4. Which Fibonacci number corresponds to the number of compositions of n=5 in terms of 1's and 2's?
5. Who discovered the Golden Ratio and what was his observation?
6. Does Pineapples show any Fibonacci pattern? Justify.
7. Write about Fibonacci numbers and flowers.
8. Which is the only negative number such that its reciprocal can be obtained by subtracting 1 from it?
9. How can marine pollution be controlled?
10. Name any movement that was initiated against large dams, Mention its importance.
11. Which are the laws intended to prevent air pollution?
12. Welfare of Women comes under which organisation of the UN? State two other functions of the organisation.

(2 x 10 = 20)

PART B

Answer any 5 (5 marks each)

13. Discuss the Euler's construction of golden ratio.
14. What is marine pollution? What are the specific causes that lead to marine pollution?
15. What is the rabbit problem? Explain.
16. Find out the topological index of C_6H_{14}.
17. How is the Universal declaration of Human Rights significant?
18. For what values of a,b and c in $ay'' + by' + c = 0$, can we get a differential equation that has a connection with golden ratio? Explain.
19. What are the different spheres on which mankind are dependent? Explain.
20. Compute the sum $\sum_1^n {F_i}^2$ and $\sum_1^n {L_i}^2$ for $n = 5$.

(5 x 5 = 25)

PART C

Answer any 3 (10 marks each)

21. Elaborate on food and land resources.
22. (a) Write a note on Golden ratio and origami.
(b) Consider an equilateral traingle ABC inscribed in a circle. Let Q and R be the mid points of the sides AB and BC and let QR meet the circle at P.and S such that $PQ = RS = 1$ and $QR = x$. Find x.

23. What are hazardous wastes? How can it be classified? What are its effects on humans and the environment?

24. Explain the rabbit problem and also derive the recursive definition of Fibonacci numbers from it.

(10 x 3 = 30)