

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600086
(For candidates admitted during the academic year 2019-2020 & thereafter)
SUBJECT CODE : 19PH/PE/MU15
M.Sc DEGREE EXAMINATION, APRIL 2022
PHYSICS
SECOND SEMESTER

COURSE : ELECTIVE
PAPER : MEDICAL PHYSICS AND ULTRASONICS
TIME : 3 HOURS

MAX MARKS: 100
(10 x 3 = 30)

SECTION A

Answer all the questions

1. What is normal blood pressure and how is blood pressure measured?
2. Why would a doctor order an EMG?
3. Briefly explain the working of ventilator.
4. How does anesthesia work?
5. Distinguish between reflection and scattering of light.
6. What is fluorescence and how does it occur?
7. What is meant by mole fraction and weight fraction?
8. What do you understand by acoustical impedance?
9. How is ultrasound used in food industry?
10. Write a note on ultrasonic level meter.

SECTION B

(5 x 5 = 25)

Answer any Five Questions

11. Write a note on Magnetic Resonance Imaging.
12. Compare Haemodialysis and Peritoneal Dialysis.
13. List medical application of laser.
14. Apply laser to detect cancer.
15. What is ultrasonic interferometer? How does it used to study the liquid?
16. Discuss Nomoto's Relation Acoustical Parameters.
17. Apply ultrasound wave in welding and cleaning.

SECTION C

(3 x 15 = 45)

Answer any Three Questions

18. Explain the electrical signals from brain and heart. Describe the Electrocardiography and Electroencephalogram techniques.
19. What do you understand by dialysis? Why is it necessary? Elucidate Peritoneal Dialysis unit with a neat figure.
20. What is laser? How does laser apply in i) Blood cell counter ii) Blood flow meter iii) angioplasty?
21. Describe free length theory and collision factor theory for pure liquids and binary mixture to determine velocity of wave.
22. Explain the following i) Ultrasonic microscopy ii) Acoustic holography.
