(6 pages)

Reg. No. :.....

Code No. : 20607 E Sub. Code : ESPH 22

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025.

Second Semester

Physics

Skill Enhancement Course — PHYSICS OF MEDICAL INSTRUMENTS

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which electrodes are mostly employed in bio medical instrumentation?
   (a) Silver – Silver chloride
   (b) Magnesium – magnesium chloride
   (c) Copper – copper chloride
   (d) Potassium - potassium chloride

2. pH electrode is made up of _____.
   (a) Silver (b) Glass
   (c) Copper (d) Aluminum

3. The number of electrodes used to record ECG is
   (a) One (b) Two
   (c) Three (d) Four

4. Electrodes to measure EEG are placed on _____
   (a) Fore head (b) Chest
   (c) Cheek (d) Scalp

5. Which of the diathermy machine is good for deep tissue healing?
   (a) Long wave (b) Ultra sound
   (c) Short wave (d) None of these

6. Which of the following is the SI unit of radiation?
   (a) Barn (b) Becquerel
   (c) Curie (d) Fermi

7. CT scan stands for

(a) Computed Tomography scan

(b) Computerized Topography scan

(c) Coloured Topography scan

(d) Coloured Tomography scan

8. The commonly used MRI's have a magnetic strength of ———— Tesla.

(a) 0 – 1.5 (b) 1.5 – 3

(c) 3 – 6 (d) 6 – 12

9. The X-Ray is recorded on a plate coated with ————.

(a) Gold halide

(b) Copper halide

(c) Silver halide

(d) Silver chloride

10. The endoscope that examines the respiratory tract is called as ————.

(a) Cadioscopy

(b) Laproscopy

(c) Otoscopy

(d) Bronchoscopy

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Briefly discuss bio electric potential.

Or

(b) Writ a short note on pH electrode.

12. (a) Narrate the origin of cardiac action potential.

Or

(b) Give an account of action potentials of the brain.

13. (a) Describe microwave diathermy.

Or

(b) Explain thermos luminescence dosimeter.

14. (a) Describe the principle of NMR.

Or

(b) Draw the block diagram of MRI system.

15. (a) Write a note on image intensifiers.

Or

(b) List the advantages of laser surgery.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the factors to be considered while designing any medical instrument.

Or

(b) Describe the different types of electrodes.

17. (a) Explain ECG lead configurations.

Or

(b) Describe the block diagram of modern EEG unit.

18. (a) Explain the working of ventilator with a block diagram.

Or

(b) Give an account of film dosimeter.

19. (a) Explain the construction and working of CT scanner.

Or

(b) Describe the construction of ultrasonic transducer.

20. (a) Compare radiography with fluoroscopy.

Or

(b) Describe the different types of endoscopes.

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