



B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2015)

Fourth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U15ECTE06: Biomedical Instrumentation

COURSE OUTCOMES

- CO1:** Explain human physiology and the concept of bio-electric potential (K2).
CO2: Apply the knowledge of basic sciences to measure bio-electric potential (K3).
CO3: Demonstrate the working of different diagnostic equipment (K4).
CO4: Analyze the given bio medical image for diagnosis (K4).
CO5: Illustrate the operation of physiological assist devices and bio telemetry system (K2).
CO6: Identify the different shock hazards to prevent electrical accidents (K2).

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match list I with list II and select the correct answer using the codes given below.

CO1 [K₁]

List I		List II	
A. Systole		i. produces no movement	
B. Isometric Contraction		ii. produces movement	
C. Diastole		iii. Contraction of Heart muscles	
D. Isotonic Contraction		iv. Relaxation of heart muscles	

- | | A | B | C | D |
|----|-----|----|-----|----|
| a) | ii | i | iii | iv |
| b) | iii | iv | ii | i |
| c) | ii | iv | iii | i |
| d) | iii | i | ii | iv |
2. Different substances that make up the cell are collectively called as _____

CO1 [K₁]

- | | |
|------------------|----------------|
| a) Cytoplasm | b) Protoplasm |
| c) Cell membrane | d) Nucleoplasm |

9. Assertion (A): Jellies are used as Electrode paste CO2 [K₁]
Reason (R): Connectivity is increased using jellies.
- a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false d) A is false but R is true
10. EMG measures CO3 [K₂]
- a) Electrical activity of heart b) Electrical activity of brain
c) Electrical activity of visual cortex d) Electrical activity of muscle

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. Define Goldman's and Nernst equation of resting potential CO1 [K₂]
12. Differentiate Resting potential and Action potential CO1 [K₂]
13. Mention the basic requirements of bio-amplifier CO2 [K₂]
14. What is half-cell potential? CO2 [K₂]
15. State the need for biotelemetry. CO5 [K₁]
16. Mention the applications of Endoscopy CO5 [K₁]
17. Define Larmor frequency and relate it with gyromagnetic ratio. CO4 [K₂]
18. What is Positron Emission Tomography? CO4 [K₂]
19. What is the use of Plethysmograph? CO3 [K₁]
20. Explain the Principles behind gamma-camera detection. CO4 [K₂]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. Explain in detail about various lead system used for measuring ECG. CO2 [K₂]
22. i. Differentiate between internal and external pacemaker. (7) CO3 [K₂]
ii. Explain the various modes of pacemaker. (7)
23. Explain Short wave, Microwave and Ultrasonic diathermy methods in detail CO4 [K₂]
24. Describe in detail about Urinary System CO1 [K₂]

25. Define Electrodes. What is the purpose of using electrode paste? Explain in detail about micro electrodes CO2 [K₂]
26. Explain the principle and working of Computerized Axial Tomography CO5 [K₃]
27. Explain physiological effects of electrical current and shock hazards from electrical equipments. Also discuss about electrical accidents and their prevention. CO6 [K₂]
