

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), November-December 2017

B. Tech/ M. Tech (as applicable) in ...Electrical Engineering, Semester ...VII...

Roll No.....

COURSE CODE: ECE722

Time: 3 hours

Max. Marks: 100

COURSE TITLE: Biomedical Engineering

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
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Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

i. Which of the following is not a part of the respiratory system

- (a) pharynx
- (b) larynx
- (c) trachea
- (d) endocardium

ii. The pulmonary valve consists of how many half-moon shaped cusps -----

- (a) one
- (b) two
- (c) three
- (d) four

iii. Which of the following is/are the parts of the brain-

- (a) medulla oblongata
- (b) pons
- (c) diencephalon
- (d) all of the above

iv. Which medical equipment was discovered earlier in the chronological order?

- (a) ECG
- (b) CAT
- (c) PET
- (d) MRI

v. What is the electrode potential of Aluminium with respect to hydrogen-

- (a) -1.66 V
- (b) -1.2V
- (c) 1.2 V
- (d) none of these

vi. The myocardium is

	(a) Upper layer of the heart (b) Inner layer of the heart (c) Outer layer of the heart (d) None of these	
vii.	The gas exchanges in the tissues are called (a) External respiration (b) Internal respiration (c) Respiration (d) None of these	
viii.	The amplitude of U wave is generally (a) less than 0.1 mV (b) 0.25 mV (c) 1.60 mV (d) 1 mV	
ix.	A CT number scale of +100 represents (a) air (b) water (c) oil (d) high dense materials	
x.	Which biomedical instrument is used for in-vitro analysis- (a) artificial pacemaker (b) MRI (c) ECG (d) artificial stem	
Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	Compare In vivo and In vitro analysis and clinical instrumentation and research instrumentation.	
ii.	Write the full form for the following abbreviations - • SPECT • PET • ICD • CAT • EEG	
iii.	What do you mean by intelligent medical instrumentation system?	
iv.	Define (i) WiMAX (ii) WLAN (iii) WPAN (iv) WBAN	
Q.3A	Illustrate with help of block diagram a generalized medical instrumentation system and it's various subsystems.	05
Q.3B	What are the major constraints encountered while designing a measurement system for medical applications? Explain with examples.	05
Q.4A	Write a short note on the application of micro-electro-mechanical systems	05

	(MEMS) in the field of biomedical engineering.	
Q.4B	Write a short note on cardiac pacemaker.	05
Q.5A	What is the significance of the following parameters in determining the performance of a medical instrument? • Input impedance • Frequency response • Signal-to-noise ratio	05
Q.5B	Describe the cardiovascular system in detail. Name the four valves associated with the functioning of the heart and describe their function.	05
Q.6A	Name the five types of bio-signals and explain their origin.	05
Q.6B	How and why implantable devices pose great challenge to integrated circuit designers.	05
OR		
Q.6B	Explain portable medical instrumentation system with the help of block diagram.	05
Q.7	Write a short note on the following modes and scanning system (i) A scan mode (ii) B scan mode (iii) M scan mode	10
OR		
Q.7	With necessary block diagram explain the scanning and displaying arrangement of IR imaging system.	10
Q.8	With necessary block diagram explain in detail the process of blood pressure measurement.	10
Q.9A	Explain in detail Ultrasonic imaging system also classify axial resolution and lateral resolution.	10
Q.9B	What is electrode? Explain in detail the types and characteristics of the following electrodes. (i) Lumb electrode (ii) Suction cup electrtoode (iii) Floating electrode	10
OR		
Q.9B	Explain characteristics of resting potential and process of changes in the cell due to depolarization also explain the waveform of action potential.	10

Best of luck!!!