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Question Paper Code: 59B51

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Open elective

Civil Engineering

15UBM951 –BIOMEDICAL INSTRUMENTATION SYSTEMS

(Common to CSE, ECE, EEE, EIE, Mechanical, IT, Chemical)

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Saw-tooth voltage of a CRO means CO1- R
(a) Only sweep time (b) Sweep time + fly back time
(c) Fly back time + sweep time (d) Only fly back time
2. Output of sweep and time base generator will be CO1- R
(a) sinusoidal waveform (b) cos waveform
(c) saw tooth waveform (d) both a and b
3. An EMG measures: CO2- R
(a) Electric activity in the heart (b) Electric activity in the brain
(c) Electric activity in your visual cortex (d) Electric activity in muscles
4. The frequency range of EEG wave is _____. CO2- R
(a) 0.05 Hz – 100 Hz (b) 0.5 Hz – 160 Hz
(c) 0.05 Hz – 160 Hz (d) 10 Hz – 100 Hz
5. In an ideal Operational Amplifier, the values of the current drawn at input terminals and the input impedance are _____, _____. CO3- R
(a) 0,0 (b) 0,∞ (c) ∞,0 (d) ∞,∞

6. The ideal op-amp act as CO3- R
 (a) integrator (b) differentiator
 (c) differential amplifier (d) all the above
7. Liquid in our body that contains hemoglobin is called CO4- R
 (a) Blood (b) Plasma (c) Semen (d) Vascular Juice
8. Beat inside chest (left rib) is due to CO4- R
 (a) Huge blood vessels (b) Heart (c) Lungs (d) Bones
9. Value of pH is determined by_____. CO5- R
 (a) pH electrode (b) pH detector (c) pH balancer (d) pH pectrometer
10. A manometer is used to measure the pressure of a CO5- R
 (a) Gas (b) Liquid (c) Gas as well as liquid (d) None

PART – B (5 x 2= 10Marks)

11. Distinguish a action and resting potential. CO1- Ana
12. List the frequency range of ECG,EEG and EMG waves? CO2- R
13. Define power amplifier. CO3- R
14. Define Cardiac output. CO4- R
15. Define Bio chemical sensors. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Analyze an electrical equivalent circuit for half cell potential and origin of biopotential. CO1- Ana (16)
- Or
- (b) Categorize the various electrodes with necessary diagrams used in measurement of Bio potential. CO1- Ana (16)
17. (a) Draw the block diagram of an ECG machine and explain the functions of each block along with its characteristics. CO2- U (16)

Or

- (b) Describe the 10- 20 electrode system used in EEG and give the uses of EEG. CO2- U (16)
18. (a) Classify the various modes of operational amplifiers with circuit diagrams. CO3- U (16)
- Or
- (b) Draw the circuit of non-mechanical chopper amplifier and explain its working. CO3- U (16)
19. (a) Classify the various types of respiration measurement and explain any two types. CO4- U (16)
- Or
- (b) Classify the various cardiac output measurement techniques. CO4- U (16)
20. (a) Explain about blood gas analyzer with neat diagram. CO5- U (16)
- Or
- (b) Explain the working of blood cell counter with neat sketch. CO5-U (16)

