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Reg. No. :

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Question Paper Code: 59B51

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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)

- Deflection sensitivity of CRO depends on CO1- R
 - Deflection voltage, separation between the plates and plate length
 - Only deflection voltage
 - Only separation between plates
 - Electron density
- Output of sweep and time base generator will be CO1- R
 - sinusoidal waveform
 - cos waveform
 - saw tooth waveform
 - both a and b
- The graphic record of the heart sound is called _____. CO2- R
 - Phonocardiogram
 - Photoplethysmography
 - ECG
 - EEG.
- The frequency range of EEG wave is _____. CO2- R
 - 0.05 Hz – 100 Hz
 - 0.5 Hz – 160 Hz
 - 0.05 Hz – 160 Hz
 - 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. In the internal circuit of an Operational Amplifier, _____ is used as the buffer. CO3- R
- (a) Push Pull amplifier (b) Emitter Follower
(c) Differential Amplifier (d) Common Emitter
7. Liquid in our body that contains hemoglobin is called CO4- R
- (a) Blood (b) Plasma (c) Semen (d) Vascular Juice
8. 120 to 140 mm of mercury is an adults normal CO4- R
- (a) systolic pressure (b) diastolic pressure
(c) peristalsis pressure (d) water pressure
9. Value of pH is determined by _____. CO5- R
- (a) pH electrode (b) pH detector (c) pH balancer (d) pH pectrometer
10. A Which of the following relationships between absorbance and %transmittance is incorrect? CO5- R
- (a) $A = \log_{10} 100 / \%T$ (b) $A = 2 - \log_{10} \%T$ (c) $A = \log_{10} 1 / T$ (d) All are correct

PART – B (5 x 2= 10Marks)

11. What is the electrolyte present in the cell? CO1- Ana
12. What are the electrodes used for EEG? CO2- R
13. Define CMRR. CO3- R
14. List the methods of pulse measurement. CO4- R
15. What are the two methods of pO₂ measurement? CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Classify the bio potential, with reference to Goldman's and Nernst equation. CO1- Ana (16)
- Or
- (b) Explain the structure of human cell in detail. CO1- Ana (16)
17. (a) List out the different lead system in ECG with necessary diagrams. CO2- U (16)
- Or

- (b) Explain the working of EEG Recording setup with necessary diagrams. CO2- U (16)
18. (a) Classify the chopper amplifiers and draw its equivalent circuits. CO3- U (16)
Or
(b) Explain the various types of operational amplifier with circuit diagrams. CO3- U (16)
19. (a) Explain the Various Indirect Blood Pressure Measurement Techniques. CO4- U (16)
Or
(b) Explain the different methods in pulse rate measurement with necessary diagrams. CO4- U (16)
20. (a) Explain the pH and Po₂ measurement with necessary diagrams. CO5- U (16)
Or
(b) Explain about colorimeter and spectrophotometer with neat sketches. CO5-U (16)

