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Reg. No. :

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Question Paper Code: 59B51

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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. The sweep generator of a CRO is used to produce CO1- R
 - (a) Sinusoidal voltage for the horizontal deflection of electron beam
 - (b) Saw tooth voltage for the vertical deflection of electron beam
 - (c) Sinusoidal voltage for the vertical deflection of electron beam
 - (d) Saw tooth voltage for the horizontal deflection of electron beam

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. The graphic record of the heart sound is called _____. CO2- R
 - (a) Phonocardiogram
 - (b) Photoplethysmography
 - (c) ECG
 - (d) EEG.

4. An EEG measures: CO2- R
 - (a) Brain waves
 - (b) Emotional response
 - (c) Heart rate
 - (d) Galvanic skin response

5. Input offset current is evaluated by, _____ . CO3- R
 (a) $|I_{OS}| = I_B^+ + I_B^-$ (b) $I_{OS} = I_B^+ + I_B^-$ (c) $|I_{OS}| = I_B^+ - I_B^-$ (d) $I_{OS} = I_B^+ - I_B^-$
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. Indicator dilution method is used to measure CO4- R
 (a) cardiac output (b) blood flow (c) pulse rate (d) none of above
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 manometer is used to measure the pressure of a CO5- R
 (a) Heavy liquids (b) Light liquids
 (c) Both light as well as heavy liquids (d) None of the above

PART – B (5 x 2= 10Marks)

11. Define polarized and non-polarized electrodes? CO1- U
12. The R wave amplitude in lead II is 0.71. Then what is the sum of R wave amplitude in other two leads. CO2- App
13. Define 'slew rate'. When does it start showing its effect on amplifier performance CO3- R
14. List the methods of pulse measurement. CO4- R
15. Distinguish the colorimeter and spectrophotometer CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain in detail about the Surface and needle electrode. CO1- Ana (16)
 Or
 (b) Explain the characteristics of resting potential, with reference to Goldman's and Nernst equation CO1- Ana (16)

17. (a) Draw the modern EEG unit and explain the functions. CO2- U (16)
Or
(b) Discuss different lead configuration used in ECG recording CO2- U (16)
18. (a) Explain the power and efficiency of ECG-Bio amplifier.. CO3- U (16)
Or
(b) Draw the circuit diagram of Darlington pair isolation amplifier CO3- U (16)
and explain
19. (a) List the various methods of Blood flow measurement and explain CO4- U (16)
any one method.
Or
(b) Explain the different methods in pulse rate measurement with CO4- U (16)
necessary diagrams.
20. (a) Explain the working principle of flame photometer with necessary CO5- U (16)
diagrams.
Or
(b) Explain about colorimeter and spectrophotometer with neat CO5-U (16)
sketches.

