TE Sem VI (Rev) CBGS. 19/11/15 (06)

Bio-medical

SUB : BMI - II

Q.P. Code : 6272

(3 Hours) Total Marks : 80

N.B: (1) Q.1 is compulsory.
(2) Attempt any three questions from remaining questions.
(3) Assume suitable data if required, clearly mentioning your assumption.
(4) Figures to right indicate marks.

1. Attempt any four : 20
   (a) Compare the ECG waveform in lead II and AVR.
   (b) If the right leg of the patient is amputed, how would you choose the reference for ECG recording in limb leads.
   (c) Can heart rate and pulse rate be different ? Justify your answer.
   (d) Explain with suitable sketches the indirect sphygmomanometer method to measure blood pressure.
   (e) Draw the waveforms of the following types of arrythemia
      (i) Tachycardia
      (ii) Bradycardia
      (iii) Ventricular fibrillations

2. (a) Design a three OPAMP instrumentation amplifier for ECG signal recording with gain = 1000. 10
   (b) Justify the need of different lead combinations. Draw and explain unipolar and biopolar leads in ECG. 10

3. (a) With the help of neat block diagram explain apnoea detection and its significance. 10
   (b) Explain using suitable block diagram the ultrasonic doppler shift based foetal heart rate measurement technique. 10

4. (a) Draw and explain cardiac cell action potential covering 10
      (i) Waveform and types of ions involved
      (ii) Relative ionic concentrations
      (iii) Name and type of channel / gates / pores involved
      (iv) Synchronized activity resulting action potential
   (b) With the help of suitable sketches explain 10-20 electrode system in ECG recording. 10

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5.	(a)	What are the different low frequency noise sources in biopotential recording ? Draw and explain DC restorer circuit.	10
	(b)	Explain the various design criteria for designing point of care diagnostic devices.	10
6.	(a)	Compare microshock and macroshock. Explain suitable methods to reduce them.	10
	(b)	Write short notes (any two) (i) Temperature monitoring system (ii) Instantaneous heart rate recording (iii) EEG lead selection network (iv) Labour activity monitor	10