Q.P. 24498 11z

Paper 2 solution

Q1a	Diagram of cell with ions and cell membrane- 2 mark Explaination of resting membrane potential – 3 marks
Q1b	1mark per each of the design criteria, some are enlisted here: • Battery operated, light weight • Use of dry biochemistry • Simple to use • Safe to handle, non biohazardous • Patient comfort • Easy to interprete the results by operator • Accurate • Easy to calibrate locally
Q1c	Comparative statement about • Noise (2 marks) • Signal strength (2 marks) • Electrode surface area (1 marks) • Signal phase (2 marks) • Area of study (1 marks)
Q1d	Noise type and explanation of source 2 marks • Other signal from body • 50 Hz mains noise • Electromagnetic interference from other equipments • Radio frequency communication
Q1e	2 mark for each significance • Biofeedback • Energy delivery in defib • Lie detector
Q2a	Skin electrode interface diagram-1 Labeling-1 Co relation with motion artefacts-3
Q2b	Role of potassium in action potential-2 marks Effect of increase in potassium level-3 marks
Q2c	Drawbacks of biopotential recording with single ended amplifier types-2 marks Advantages of biopotential recording with differential amplifier types-3 marks

Q2d	2 marks for each explanation of each method • Use shield • Use battery • Use notch filter • Use high CMRR amplifier • Use shielded cable • Use shield drive circuit
Q3a	Right leg drive circuit -3 marks Waveforms -1 marks Explaination-3 marks
Q3b	List of ECG leads- 1 mark Placement of leads- I II III and AvR, AvL, AvF- 2 marks Placement of leads v1 to v6- 3 marks
Q3c	EEG wave components with frequencies- 4 marks EEG waveforms for different conditions -3 marks
Q4a	Block diagram of time division multiplexing -2.5 marks Explanation of time division multiplexing -2.5 marks Block diagram of frequency division multiplexing -2.5 marks Explanation of frequency division multiplexing -2.5 marks
Q4b	Block diagram 5 marks Explanation 5 marks
Q5a	Block diagram 3 marks Waveforms 3 marks Explanation 4 marks
Q5b	Constructional details diagram -5 marks Explaination-5 marks
Q6a	Microshock and macroshock 2 mark for each point • Amplitude and current levels, • Effect on body • Current path • Control methds
Q6b	EOG measurement 2 mark for each point • Source • Electrodes used • Waveform

Repeat 2 sol^n

2/2

	• Significance
Q6c	Wilsons Lead selection network 2 mark for each point • Circuit diagram • Explaination • Significance
Q6d	Phonocardiogram 2 mark for each point • Necessity • Block diagram • Significance • Electrodes used • Waveform
Q6e	Apnoea detector. 2 mark for each point • Necessity • Block diagram • Significance • Electrodes used • Waveform