

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BE
BRANCH: EEE**

**SEMESTER : VII
SESSION : MO/18**

SUBJECT: EE7215 BIO ELECTRONICS INSTRUMENTATION

TIME: 3.00 HOURS

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Write a short note on man-instrument system. [2]
Q.1(b) Draw and label the anatomical structures of respiratory system. [4]
Q.1(c) Explain the mechanism of mechanical ventilation as well as the transport of respiratory gases. [6]
- Q.2(a) Illustrate the types of gastric action potentials. [2]
Q.2(b) Explain the mechanism of control of respiration. [4]
Q.2(c) How resting potential is determined and calculated? Explain the mechanism of generation and propagation of action potential in large nerve/muscle fiber. [6]
- Q.3(a) What are the types of electrodes used for EMG recording? [2]
Q.3(b) Draw the label the components of a disposable electrode. [4]
Q.3(c) Explain the model of skin-electrode interface for a surface electrode. [6]
- Q.4(a) Illustrate the mechanism of measurement of non-invasive blood pressure. [2]
Q.4(b) Compare three different cardiac waves in correlations with cardiac cycle. [4]
Q.4(c) With the help of block diagram, explain the function of an ECG recorder. [6]
- Q.5(a) Why a defibrillator is required in operation theatre? [2]
Q.5(b) Write a short note on electrical safety in a hospital. [4]
Q.5(c) Illustrate different types of pacemakers and explain the instrumentation of implantable pacemaker. [6]
- Q.6(a) What are the differences between anatomical and physiological imaging systems? [2]
Q.6(b) Write a short note on the instrumentation and application of microwave diathermy. [4]
Q.6(c) Explain the instrumentation and working principle of X-ray imaging system. [6]
- Q.7(a) What do you understand by a Tachogram? How it is generated? [2]
Q.7(b) Write a note on the heart rate variability analysis and its importance. [4]
Q.7(c) How frequency domain analysis is important in identification of EEG features for different events? Explain. [6]

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