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B.Tech
(SEM VIII) THEORY EXAMINATION 2017-18
DESIGN AND MODELLING OF BIOMEDICAL SYSTEMS

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a) Describe the criteria for selection of a suitable hardware while designing a system.
b) Explain Design and modeling of a system.
c) Explain some advantages of simulation.
d) Explain the different types of PCB's.
e) Explain PCB fabrication techniques.
f) Explain reliability configuration.
g) Explain the types of grounding.
h) Describe some safety measures while using electrical medical devices.
i) Define an electrical shock.
j) What is leakage current?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a) Describe the different types of sensors. What are the typical characteristic specifications of a sensor? Explain the help of some examples.
b) Name some simulation software used for the simulation of design. Describe the different types of simulation softwares and their applications in a specific field
c) What do you mean by PCB designing? Describe the different types of PCB design. Enlist the different steps of Designing PCB with the help of Softwares.
d) Discuss the various reliability aspects of biomedical equipments.
e) State the different types of electrical shock hazards. Explain the concept of proper grounding and shielding.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is a Data recorder? Explain the principle of its operation and its applications

(b) Explain the working of a Display device. With the help of a block diagram explain the essential parts of a Display device.

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) What do you mean by Simulation? Explain the concept of design Simulation. Describe the applications of design simulation.

(b) Describe the steps for simulating a circuit design in simulation software.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a)What are the different PCB designing softwares. Explain how these softwares are useful and advantageous in the PCB designing as compared to manual designing.

(b) Describe the various methods of PCB making. Explain each method with example.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) What do you mean by the reliability of biomedical equipments? Describe the need of reliability of biomedical equipments.

(b) Discuss the basic mathematics and reliability concept of medical devices. Describe the applications also.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) What do you mean by Calibrations and Testing of equipments? Explain the various methods for Calibrations and Testing of equipments.

(b) What are the safety codes for the electro medical equipments? Explain the Electrical safety analyzer.