PGIVS-037 B-21

M.Sc. IV Semester (CBCS) Degree Examination

ELECTRONICS AND INSTRUMENTATION

(Biomedical Electronics)

Paper - SCT - 4.1

Time : 3 Hours   **Maximum Marks : 80**

Instructions to the Candidates:

1. Answer the questions as per the instructions.
2. Write the question numbers clearly.

Part - A

1. Answer any **eight** of the following.   (8×2=16)

   a. Define depolarization and repolarisation.

   b. What is Action potential?

   c. Name the different types of Bio - potential electrodes.

   d. What is the residual lung volume of a normal person?

   e. Name the different types of defibrillators.

   f. What is Haemodialysis?

   g. Give the applications of Computer Aided tomography.

   h. What is radio telemetry system?

   i. What is the Echo - ophthalmoscope?

   j. What are NMR imaging techniques?

Part - B

Answer any **Four** of the following.   (4×7=28)

2. With neat diagram explain components of Bio - medical system.

3. With neat diagram explain ECG Isolation amplifier circuit.

4. Explain different types of pace makers.

5. With a neat diagram explain Physiology of Nervous System.

6. Discuss the problems in implatable telemetry systems.

7. Explain X-ray machine.

Part - C

Answer any **three** of the following. (3×12=36)

8. Discuss various types of electrodes with necessary diagrams.

9. With a neat diagram, Explain Blood circulatory system.

10. Explain organisation of Brain.

11. Explain Computer Aided Tomography.

12. Write short notes on any **Two** of the following : (2×6=12)

   a. Isolation Amplifiers.

   b. Respiratory gas analysers.

   c. Uses of Bio - telemetry.

   d. Medical Ultra Sound.

PGIVS-035-B-21

M.Sc. IV Semester Degree (CBCS) Examination
ELECTRONICS AND INSTRUMENTATION
Personal Computers for Measurement and Control

Paper : HCT 4.1

Time : 3 Hours   **Maximum Marks : 80**

Instructions to the Candidates:

    1.   *Answer the Questions as per the Instructions.*

    2.   *Write the Question numbers Properly.*

PART - A

Answer any **EIGHT** of the following.   (8×2=16)

1.   a)   Draw the block diagram of a Microcomputer.

     b)   Write the principle of optical disk data storage.

     c)   Draw the block diagram of CRT.

     d)   List out the interrupts in Computer.

     e)   What are ISA and EISA?

     f)   What is MATLAB?

     g)   Draw the DC motor control simulink model.

     h)   Define the elements of GUI.

     i)   Write the principle of PC based Level Control.

     j)   What is the role of PC in Instrumentation.

PART - B

Answer any **FOUR** of the following.   (4×7=28)

2.   With a neat diagram, Explain Microcomputer Organization.

3.   Write a note on mass data storage systems.

4.   What is Serial Port? Explain its hardware.

5.   With a neat schematic, Explain digital Input/output register interfacing technique.

6. Write MATLAB program to find the Compound Interest.

7. Explain how PC can be used to control temperature.

PART - C

Answer any **THREE** of the following. (3×12=36)

8. With neat diagram, Explain Floppy Disk Controller.

9. a) Explain the hardware of PC Parallel port. (6)
   b) Explain how Computer responds to Interrupts. (6)

10. With suitable example explain mathematical operations with Arrays in MATLAB.

11. a) Explain the block diagram of PC based UV Spectrometer. (6)

    b) Describe various detectors used in IR Spectrometer. (6)

12. Write Short notes on any **TWO**. (2×6=12)

    i) Computer Peripherals.

    ii) Memory address decoding techniques.

    iii) Applications of MATLAB using simulink.

    iv) Script Files and Function File.

PGIVS-036-B-21
M.Sc. IV Semester (CBCS) Degree Examination
ELECTRONICS AND INSTRUMENTATION
(Scientific/Analytical Instrumentation)
Paper - HCT - 4.2

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:

1. Answer the questions as per the instructions.

2. Write the question numbers clearly.

PART - A

1. Answer any **Eight** of the following.   (8×2=16)

   a. Define Beer - Lambert Law.

   b. Draw the diagram of Electro Magnetic Radiation Spectrum.

   c. Mention the different radiation sources are used in UV - Visible spectrophotometer.

   d. What are the advantages of glass electrodes?

   e. Define specific conductivity of a solution.

   f. What are the advantages of dropping mercury electrode?

   g. Define spin - spin coupling.

   h. What are the advantages of DSC over DTA?

   i. Draw the block diagram of PAS.

   j. What are the gases used as moving phase in gas chromatography.

PART - B

Answer any **Four** of the following.   (4×7=28)

2. With help of diagram, explain working of IR spectrometer.

3. Discuss the salient feature of various elements of AAS.

4. Discuss the principle and working of Polarograph with diagrams.

5. With diagram, explain working of mass spectrometer.

6. Discuss the principle and theory invoved in ESR spectrometer.

7. Explain working of scanning electron microscope with diagrams.

PART - C

Answer any **Three** of the following. (3×12=36)

8. With neat diagram, explain the principle and working of Dual beam colourimeter. Discuss some of its applications.

9. With neat schematic diagram, explain working of microcontroller based Conductivity meter.

10. Explain the principle, theory and working of NMR Spectrometer. Mention its applications.

11. With neat sketch, explain the principle and working of Differential Thermal Analyzer.

12. Write short notes on any **Two** of the following : (2×6=12)
    a. Raman Spectrometer.
    b. Mass Spectrometer.
    c. pH meter.
    d. HPCL.