

**PGIS-001-A-22****M.Sc. I Semester (CBCS) Degree Examination****APPLIED ELECTRONICS****Semiconductor and Microwave Devices****Paper : HCT 1.1****Time : 3 Hours****Maximum Marks : 80****Instructions to the Candidates:**

- i) Answer the questions as per the given instructions.
- ii) Write Question number clearly.

**PART - A****Answer any EIGHT of the following****(8×2=16)**

1.
  - i) List the commonly used semiconductor and microwave devices.
  - ii) What is thyristor?
  - iii) Define latching in thyristor.
  - iv) What is a chopper?
  - v) Give the types of choppers and state its principle of operation.
  - vi) Mention the general specifications of a klystron tube.
  - vii) State the principle of operation of TWTs.
  - viii) Define bunching process and give its significance.
  - ix) Mention the differences between the TWT and klystron.
  - x) Give the distinguishing features of LSA and READ diode.

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

2. Explain the modes of operation of thyristor.
3. A thyristor having power rating of 10kW is given the input voltage of 250V with the required  $dV/dt$  is 125 V/ $\mu$ S and the snubber capacitor of 8 $\mu$ f, find  $R_s$ ,  $I_d$  and  $T_s$ .

4. Discuss the operation of buck-boost regulators.
5. Discuss the working of DC power supplies.
6. With a schematic diagram of magnetron, explain its operation.
7. Draw and explain an equivalent circuit diagram for Manley-Rowe power relations. Also define the types of parametric devices based on power gain.

#### PART - C

**Answer any THREE of the following**

**(3×12=36)**

8. Discuss the resistance and resistance-capacitance triggering of thyristor.
9. With a neat sketch, describe the working of 1,2 and 4-quadrant choppers.
10. Describe the helix TWT's. Mention its applications.
11. Explain the construction and working of IMPATT and TRAPATT diodes.
12. Write short notes on any **TWO** of the following :
  - a) Thyristor firing circuits
  - b) Thyristor chopper circuits
  - c) Microwave considerations
  - d) Parametric amplifiers.



**PGIS-002-A-22**

**M.Sc. I Semester (CBCS) Degree Examination**

**APPLIED ELECTRONICS**

**Electronic Instrumentation**

**Paper : HCT 1.2**

**Time : 3 Hours**

**Maximum Marks : 80**

**Instructions to the Candidates:**

- i) Answer the questions as per the given instructions.
- ii) Write Question number clearly.

**PART - A**

**Answer any EIGHT of the following**

**(8×2=16)**

1.
  - i) What is the significance of an instrumentation?
  - ii) What is the importance of measurement of a typical parameter?
  - iii) Define the role of transducer in instrumentation.
  - iv) State the principle of capacitive transducer.
  - v) What do you mean by optical detector?
  - vi) Sketch and label an AC electro-dynamometer.
  - vii) Mention the advantages of DMM.
  - viii) Define auto-zeroing and auto-ranging.
  - ix) Give the basic differences between multiplexer and demultiplexer.
  - x) How will you measure humidity and its interpretation?

**PART - B**

**Answer any FOUR of the following.**

**(4×7=28)**

2. Explain the classification of instruments and its characteristics.
3. Explain the classification of transducers with its relevant example.
4. Describe the construction and working of temperature measurement transducer.



5. With suitable example, explain the need of automation in digital instruments.
6. With a neat diagram, explain the principle and operation of LVDT in parameter measurement.
7. How will you record the information through X-Y recorder and strip chart recorder? Explain.

### PART - C

**Answer any THREE of the following**

**(3×12=36)**

8. Describe the Types of measurements and errors.
9. Discuss the importance and applications of biomedical transducers.
10. Discuss the application of PC for measurement of parameters. Explain with suitable example.
11. With a neat diagram, explain the salient features of Digital Storage Oscilloscope.
12. Write short notes on any **TWO** of the following :
  - a) Generalized measurement system.
  - b) Strain gauges.
  - c) AC motor speed measurement and control.
  - d) DAC.



**PGIS-003-A-22****M.Sc. I Semester (CBCS) Degree Examination****APPLIED ELECTRONICS****Electromagnetics and Antennas****Paper : HCT 1.3****Time : 3 Hours****Maximum Marks : 80*****Instructions to the Candidates:***

- i) Answer the questions as per the given instructions.
- ii) Write Question number clearly.

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

1.
  - a) Define the TEM waves.
  - b) What do you mean by TE and TM modes?
  - c) Define Q of cavity resonator.
  - d) What is meant by Slow wave structure?
  - e) State the principle of Slide screw tuner.
  - f) Mention the types of Radiation pattern.
  - g) A dipole antenna has a radiation resistance of  $67\Omega$  and a loss resistance of  $5\Omega$ , measured at the feed-point. Calculate the efficiency.
  - h) Define potential function and its significance.
  - i) Give a principle of pattern multiplication.
  - j) What do you mean by suppression of side lobes?

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

2. Define velocity of propagation and explain the power transmitted in a lossless waveguide.
3. What are S parameters ? Mention their significance.



4. With neat schematic, describe the working principle of two-hole Directional coupler.
5. Define
  - i) Radiation Resistance
  - ii) Efficiency and
  - iii) Gain of an antenna with equations.
6. With a neat diagram, explain the principle and operation of Helical antennas.
7. What are array antennas? Mention its features and applications.

### PART - C

**Answer any THREE of the following**

**(3×12=36)**

8. What is Smith chart? Describe the construction of Smith chart. Explain its characteristic features and applications.
9. What are cavity resonators? Discuss the salient features of cavity resonators. Mention their applications.
10. With necessary theory, discuss the operation of aperture and effective aperture antennas.
11. With a neat diagram and necessary equations, explain the functioning of antenna arrays of two isotropic sources.
12. Write short notes on any **TWO** of the following :
  - a) Power dissipation in lossy waveguides
  - b) Microwave hybrid circuits.
  - c) Horn antennas
  - d) Pattern multiplication technique.