PGIS-201 A-21

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 Candidates:

   i)   Answer the question as per the instructions.

   ii) Write question number clearly.

PART - A

Answer any Eight of the following: (8×2=16)

1.   a)   Draw a circuit symbol and schematic construction of a thyristor.

   b)   Define latching and holding current.

   c)   What do you mean by light activated SCR?

   d)   Define chopper and mention its advantages.

   e)   The input voltage to snubber circuit is $V_s = 250V$, having $R = 5\Omega$, $dV/dt = 150V/\mu S$ and $I_{Th} = 100A$, , determine the value of R_s and C_s and power(P) of snubber circuit.

   f)   Mention the limitations of conventional tubes.

   g)   List the microwave characteristics of Magnetron.

   h)   Define electronic admittance.

   i)   Define Gunn effect.

   j)   List the applications of parametric amplifiers.

PART - B

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

2.   Explain the basic operating principle of a thyristor.

3.   Discuss the salient features of phase control and fast switching thyristors.

4.   Describe the principle of step-down and step-up chopper.

5. Explain the working principle of switched mode DC power supply.

6. Explain the modes of operation of Gunn diode.

7. Explain the construction and working of TRAPATT diode.

PART - C

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

8. Explain series and parallel operation of thyristors.

9. Discuss the broad classification and v_0-i_0 characteristics of choppers.

10. What are TEDs? Explain the principle of operation of Gunn-diode using valley model theory.

11. With a neat diagram explain the operation and amplification process of TWT. Derive the equation of electron beam in terms of axial electric field.

12. Write a short note on any **Two** of the following: (2×6=12)
    a) Thyristor firing circuits.
    b) SMPS.
    c) Microwave Transistor.
    d) Read diode.

PGIS-202 A-21

M.Sc. I Semester Degree Examination

APPLIED ELECTRONICS

Electronic Instrumentation

Paper : HCT-1.2

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

Instructions to the Candidates:

    i)   Answer the question as per the instructions.

    ii)   Write question number clearly.

PART - A

I.   **Answer any Eight Questions.** (8×2=16)

    a)   What is instrumentation?

    b)   What is measurement?

    c)   Define the transducer.

    d)   What are the principles that are used in a transducers operation?

    e)   Define biomedical transducer.

    f)   What is gage factor?

    g)   Define conductivity of a cell.

    h)   What is the role of a PC in instrumentation?

    i)   How do you measure and control the speed of a AC motor?

    j)   What are the types of data acquisition system?

PART - B

Answer any Four Questions. (4×7=28)

2.   Discuss the classification of instruments with an example.

3.   How are Transducers classified? Explain with an example.

4.   Explain the working principle & construction of a photoelectric transducer.

5.   What are digital instruments? Explain the working of Digital Multi-Meter.

6. Discuss the construction & working of piezoelectric transducer.

7. How does the X-Y recorder works? Explain with construction.

PART - C

Answer any Three Questions. (3×12=36)

8. What is the difference between sensor & a transducer? Explain the construction and working of pressure & displacement transducer.

9. With a neat diagram explain working of Analog to Digital Converter.

10. Define multiplexer and de-multiplexer. Explain working of any one.

11. Explain working of Digital Frequency Meter.

12. **Write a short notes on any Two Questions.**
    a) Sample and Hold circuit.
    b) DAC
    c) Digital Storage Oscilloscope
    d) Strip Chart Recorder.

PGIS-203 A-21
M.Sc. I Semester Degree Examination
APPLIED ELECTRONICS
Electromagnetics And Antennas
Paper : HCT-1.3

Time : 3 Hours   Maximum Marks : 80

PART - A

I.   Answer any Eight of the following: (8×2=16)

   a)   Give the comparison between TE and TM waves.

   b)   Define wave impedance.

   c)   What do you mean by stub?

   d)   Define the characteristic impedance.

   e)   What are the microwave hybrid circuits?

   f)   Define radiation resistance of an antenna.

   g)   Define radiation intensity of an antenna.

   h)   Define co-and cross polarization of an antenna.

   i)   Mention the features of helical antenna.

   j)   Sketch various types of horn antennas.

PART - B

Answer any Four Qestions.   (4×7=28)

2.   What is smith chart? Discuss its salient features.

3.   Explain the working of a slide screw tuner.

4.   With a neat diagram, explain the working of a waveguide TEE.

5.   Explain the design procedure of waveguide horn antenna.

6.   Calculate the radiation resistance of $\frac{7}{10}$ wire diploe in free space.

7.   Write a note on pattern multiplication with a typical example.

PART - C

8. Obtain the TE mode field equations of a rectangular waveguide.

9. With a neat diagram, explain the construction and working of a directional coupler and mention its applications.

10. Define an antenna array. Derive an expression for an array of two isotropic sources.

11. Explain the potential function for sinusoidal oscillator w.r.t. an antenna.

12. Write a short note on any **Two**. (2×6=12)

    i) Waveguide phase shifter

    ii) Horn Antenna.

    iii) Dipole antenna

    iv) Antenna characteristics.

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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 Candidates:

  i)   Answer the question as per the instructions.

  ii)   Write question number clearly.

PART-A

Answer any Eight of the following: (8×2=16)

1.   a)   Draw a circuit symbol and schematic construction of a thyristor.

   b)   Define latching and holding current.

   c)   What do you mean by light activated SCR?

   d)   Define chopper and mention its advantages.

   e)   The input voltage to snubber circuit is $V_s = 250$V, having $R = 5\Omega$, $dV/dt = 150V/\mu S$ and $I_{Th} = 100A$, , determine the value of R_s and C_s and power(P) of snubber circuit.

   f)   Mention the limitations of conventional tubes.

   g)   List the microwave characteristics of Magnetron.

   h)   Define electronic admittance.

   i)   Define Gunn effect.

   j)   List the applications of parametric amplifiers.

PART - B

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

2.   Explain the basic operating principle of a thyristor.

3.   Discuss the salient features of phase control and fast switching thyristors.

4.   Describe the principle of step-down and step-up chopper.

5. Explain the working principle of switched mode DC power supply.

6. Explain the modes of operation of Gunn diode.

7. Explain the construction and working of TRAPATT diode.

PART - C

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

8. Explain series and parallel operation of thyristors.

9. Discuss the broad classification and v_0-i_0 characteristics of choppers.

10. What are TEDs? Explain the principle of operation of Gunn-diode using valley model theory.

11. With a neat diagram explain the operation and amplification process of TWT. Derive the equation of electron beam in terms of axial electric field.

12. Write a short note on any **Two** of the following: **(2×6=12)**
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    b) SMPS.
    c) Microwave Transistor.
    d) Read diode.

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PGIS-202 A-21
M.Sc. I Semester Degree Examination
APPLIED ELECTRONICS
Electronic Instrumentation
Paper : HCT-1.2

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

Instructions to the Candidates:

    i)   Answer the question as per the instructions.

    ii)   Write question number clearly.

PART - A

I.   **Answer any Eight Questions.**   (8×2=16)

    a)   What is instrumentation?

    b)   What is measurement?

    c)   Define the transducer.

    d)   What are the principles that are used in a transducers operation?

    e)   Define biomedical transducer.

    f)   What is gage factor?

    g)   Define conductivity of a cell.

    h)   What is the role of a PC in instrumentation?

    i)   How do you measure and control the speed of a AC motor?

    j)   What are the types of data acquisition system?

PART - B

Answer any Four Questions.   (4×7=28)

2.   Discuss the classification of instruments with an example.

3.   How are Transducers classified? Explain with an example.

4.   Explain the working principle & construction of a photoelectric transducer.

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6. Discuss the construction & working of piezoelectric transducer.

7. How does the X-Y recorder works? Explain with construction.

PART - C

Answer any Three Questions. (3×12=36)

8. What is the difference between sensor & a transducer? Explain the construction and working of pressure & displacement transducer.

9. With a neat diagram explain working of Analog to Digital Converter.

10. Define multiplexer and de-multiplexer. Explain working of any one.

11. Explain working of Digital Frequency Meter.

12. **Write a short notes on any Two Questions.**

   a) Sample and Hold circuit.

   b) DAC

   c) Digital Storage Oscilloscope

   d) Strip Chart Recorder.

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PGIS-203 A-21

M.Sc. I Semester Degree Examination

APPLIED ELECTRONICS

Electromagnetics And Antennas

Paper : HCT-1.3

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

PART - A

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

    a) Give the comparison between TE and TM waves.

    b) Define wave impedance.

    c) What do you mean by stub?

    d) Define the characteristic impedance.

    e) What are the microwave hybrid circuits?

    f) Define radiation resistance of an antenna.

    g) Define radiation intensity of an antenna.

    h) Define co-and cross polarization of an antenna.

    i) Mention the features of helical antenna.

    j) Sketch various types of horn antennas.

PART - B

Answer any Four Qestions.   (4×7=28)

2. What is smith chart? Discuss its salient features.

3. Explain the working of a slide screw tuner.

4. With a neat diagram, explain the working of a waveguide TEE.

5. Explain the design procedure of waveguide horn antenna.

6. Calculate the radiation resistance of $\frac{\tau}{10}$ wire diploe in free space.

7. Write a note on pattern multiplication with a typical example.

PART - C

Answer any Three Questions.   (3×12=36)

8. Obtain the TE mode field equations of a rectangular waveguide.

9. With a neat diagram, explain the construction and working of a directional coupler and mention its applications.

10. Define an antenna array. Derive an expression for an array of two isotropic sources.

11. Explain the potential function for sinusoidal oscillator w.r.t. an antenna.

12. Write a short note on any **Two.**   (2×6=12)

    i)   Waveguide phase shifter

    ii)   Horn Antenna.

    iii) Dipole antenna

    iv) Antenna characteristics.

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PGIS-204 A-21

M.Sc. I Semester Degree Examination

APPLIED ELECTRONICS

Digital Electronics and 8085 Microprocessor

Paper : SCT-1.1

Time : 3 Hours

Maximum Marks : 80

PART - A

Answer any Eight of the following:

(8×2=16)

1. a) Define propagation delay and noise margin.

    b) Sketch open collector gate.

    c) Differentiate between TTL and Schottky gates.

    d) State the purpose of pointer registers.

    e) What do you mean by memory and I/O write?

    f) Define Cache memory.

    g) Give the function of standard I/O.

    h) Define interrupt and mention its types.

    i) What do you mean by peripheral interfacing?

    j) List the important modes of 8255.

PART - B

Answer any Four of the following:

(4×7=28)

2. Discuss the TTL characteristics.

3. Explain the timing diagrams of 8085

4. With relevant examples, discuss data transfer instructions.

5. Define subroutine. Explain a procedure to call a subroutine in a program.

6. Write an ALP of 8085 to find a largest number amongst 10 numbers.

7. Describe the working of 8259 to process the request of a device connected to it.

PART - C

(3×12=36)

8. Discuss the various logic families and their important characteristics.

9. Discuss the interrupt types & Operation.

10. Describe the significance of coprocessors & their applications.

11. With a neat diagram, explain the interfacing of DAC to 8085.

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

    i) Tri-state gates

    ii) Addressing modes of 8085

    iii) 8085 based system design

    iv) 8237