

Term End External Examination 1ST Semester (Session-Feb 2025)

Subject: Electronics

Course No and Title: ELT122M/ Network Analysis and Analog Electronics

Time: 2.15 hours Max Marks:100 Min. Marks:40

Section A: Objective Type Questions

- Q1. Choose the appropriate Answer: (8x1.5=12)**
- Which of the following is an example of a passive circuit component?
A Transistor B Inductor
C Operational amplifier D SCR
 - Capacitors store energy in the form of:
A Electric field B Magnetic field
C Heat energy D Mechanical energy
 - Kirchhoff's Voltage Law (KVL) is based on the principle of
A Conservation of momentum of B Conservation of energy
C Conservation of charge D Conservation of power
 - According to the Maximum Power Transfer Theorem, maximum power is transferred to the load when the load resistance is
A Equal to the source resistance B Half of the source resistance
C Twice the source resistance D Independent of the source resistance
 - A P-type semiconductor is formed by doping intrinsic semiconductor with
A Hexavalent impurities B Pentavalent impurities
C Tetravalent impurities D Trivalent impurities
 - In a PN-junction diode under forward bias condition, the depletion region:
A Widens B Becomes neutral
C Narrows down D Remains unchanged
 - In which region does a transistor act as an amplifier?
A Cut-off region B Active region
C Saturation region D Breakdown region

viii. Compared to BJTs, MOSFETs have:

- A Higher input impedance B Lower switching speed
C More power dissipation D Lower efficiency

Section-B: Descriptive Type Questions (Short Type)**Q2: Answer all the Questions (8 x 4 =32)**

- What is capacitance, and how do capacitors store energy?
- What is equivalent resistance?
- Define Node, Mesh and Loop.
- What is a Star Network?
- Name some commonly used semiconductor materials.
- Define ripple factor of a rectifier.
- What are the three regions of operation of a transistor?
- What is Pinch-off voltage?

Section – C: Descriptive Type Questions (Medium Type)**Answer all the questions: (4 x 7=28)****Q3.** What are the basic passive components? Give their applications.**OR**

Derive the expression for effective resistance of three resistors R1, R2 and R3 connected in Series and parallel

Q4. State and explain KCL and KVL.**OR**

Differentiate between mesh analysis and nodal analysis.

Q5. What is Hole current? Discuss the effect of temperature on conductivity of semiconductors.**OR**

Discuss the working of Half wave rectifier.

Q6. Draw and explain the characteristics of transistor in CE configuration.

OR

Explain the construction and working of JFET.

Section – D: Descriptive Type Questions (Long Type)

Answer any two of the following: (2 x 14=28)

- Q7.** What is an ideal and practical Voltage and Current source? Explain the VI characteristics of ideal voltage and ideal current source.
- Q8.** State and prove Thevenin's Theorem.
- Q9.** What is a PN junction diode? Explain the formation of depletion region and draw its VI characteristics.
- Q10.** Explain the construction and working principle of Bipolar Junction Transistor (BJT).