2/21

3009N610

Candidate's Seat No :_____

B.Sc Sem.-6 (Rep) Examination
CC 310
Electronics
September-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Q.1(a) What is strain gauge? Derive the expression of gauge factor. (7)

(b) What is LVDT? Explain in detail with advantages and disadvantages. (7)

OR

(a) How do photosensitive devices work as transducers? Name the different types of photosensitive devices with its working. (7)

(b) Write a detailed note on Thermistor and its characteristics. (7)

Q.2(a) Describe the singularity functions with necessary diagrams. (7)

(b) Discuss the classification of systems. How is a LTI system causal? (7)

OR

(a) Write the properties of Z-transform. (7)

(b) What is inverse Z-transform? Discuss the long division method to find inverse Z-transform. (7)

Q.3(a) State and explain the uniqueness theorem. (7)

(b) Discuss radiation pressure and momentum of a wave. (7)

OR

(a) Obtain the general solution of Laplace equation in rectangular coordinate system. (7)

(b) Derive Maxwell's equation and explain the displacement current term. (7)

Q.4(a) Explain the diffusion of holes in N-type semiconductor and obtain expression for current density. (7)

(b) Derive continuity equation. (7)

OR

(a) Obtain Einstein relation for non-uniformly doped P-type semiconductor. (7)

(b) Explain band theory from collective approach. (7)

Q.5 Answer in short (Any Seven) (14)

(i) What is RTD?

(ii) Define transducer.

(iii) Name any two force summing devices.

(iv) Find Z-transform of δ (n+3).

(v) Define energy signal.

(vi) What is ROC?

(vii) Write Poisson's equation.

(viii) What is coercive force?

(ix) What is Hysteresis?

(x) Define intrinsic semiconductor.

(xi) Name the two conduction processes in semiconductors.

(xii) Why is the effective mass of electron considered negative at the top of the valance band.