Exam. Code: 0933
Sub. Code: 33743

2125

B.E. (Electrical and Electronics Engineering)
Third Semester
PC-EE-303: Analog Electronics

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

I. **(a)** Explain how a p-n junction diode functions as a rectifier? **(2)**
(b) Write Ebers-Moll equation for a transistor. **(2)**
(c) Why MOSFET is called voltage-controlled device and BJT is called current controlled device. **(2)**
(d) Define slew rate and write its equation. **(2)**
(e) Draw circuit diagram of a peak detector. **(2)**

Part- A

II. **(a)** For a reverse biased diode, does the transition region increase or decrease in width? What happens to the junction potential? **(5)**
(b) Derive expression for efficiency and ripple factor of bridge type rectifier. **(5)**

III. **(a)** In an NPN silicon transistor, current gain α_{dc}=0.995 emitter current I_E = 10 mA and leakage current I_{CO} = 0.5 μA Determine I_C, I_B, β_{dc} and I_{CEO}. **(5)**

b) Compare CB, CE and CC configurations of BJT. Out of the three which one is used as an amplifier and why? **(5)**

IV. **(a)** Explain the basic construction, working and V-I characteristics and of an enhancement type N-channel MOSFET. What are the advantages of MOSFET over Bipolar Junction Transistor? **(5)**

(b) Explain the working of common source MOSFET as an amplifier and derive expression for gain, impedance & trans-conductance. **(5)**

P.T.O.

Part-B

V. **(a)** What are power amplifiers? Draw and explain the circuit diagram of a push-pull amplifier. Describe its advantages and disadvantages. **(5)**

(b) Draw schematic block diagram and equivalent circuit of operational amplifier. List the main characteristics of ideal Op-amp. **(5)**

VI. **(a)** Draw circuit diagram and derive expression for a basic integrator using Op-amp.. Write its limitations also. **(5)**

(b) Design a R-C Phase shift oscillator to produce a 1kHz frequency. **(5)**

VII. Write note on following:

(a) Zero Crossing Detector **(5)**

(b) Instrumentation Amplifier. **(5)**

x-x-x