[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2067)

17007(M)

B. Tech 2nd Semester Examination

Fundamental of Electronics Engineering (CBS)

EC-101

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question each from section A, B, C & D. Section E is compulsory.

SECTION - A

1. (a) What do you mean by intrinsic and extrinsic semiconductor? What is the effect of temperature on semiconductor? (6)

   (b) What are the two types of capacitance across a P-N junction? Explain in detail. Which of these is more important in case of forward bias? (6)

2. (a) Define Filter. Explain LC and π filter in detail. (6)

   (b) What do you understand by LED? Draw its symbol. Explain principle, working and characteristics of LED. Write its applications also. (6)

SECTION - B

3. (a) What is current amplification factor? Derive the relation between Beta and Alpha of a transistor. (6)

   (b) What do you mean by depletion and enhancement MOSFET? Explain their construction, working and characteristics. (6)

4. (a) A germanium transistor used as an amplifier has a collector cut off current I_{CBO} = 10μA at a temperature 27°C and β= 50.

   (i) What is the collector current when the base current is 0.25mA?

   (ii) Assuming that β does not change with temperature, what would be the value of new collector current, if the transistor's temperature rises up to 50°C? (6)

   (b) Draw and explain Static characteristics and transfer characteristics of N-channel JFET. (6)

SECTION - C

5. (a) Draw the circuit diagram of Wein bridge oscillator using transistor and explain its operation by deriving expression for frequency of oscillation. (6)

   (b) Draw the equivalent circuit of an OP-AMP and explain the various parameters used in the equivalent circuit. (6)

6. (a) What do you understand by closed loop and open loop gain of an OP-AMP, when a Non-inverting OP-AMP acts as a voltage follower? (6)

   (b) Draw and explain the circuit of a tuned plate oscillator. Explain how oscillations originate in this circuit. (6)

SECTION - D

7. (a) State and prove the De-Morgan's theorem. (6)

   (b) Draw and explain the block diagram of Catode Ray Tube & Write its uses. (6)

[P.T.O.]

8. (a) How do you measure unknown phase and unknown frequency using CRO? Explain properly. (6)

   (b) What is Half adder? How is it realized using logic gates? Design a full adder circuit using NAND gate. (6)

SECTION - E

9. (a) Explain the frequency stability in Oscillators.

   (b) Which gates are known as universal gates and why?

   (c) Define static and dynamic resistance of Diode.

   (d) Differentiate CB, CC, and CE configuration.

   (e) Comparison of P-channel and N-channel MOSFETS.

   (f) Describe the ideal characteristics of an OP-AMP.

(2×6=12)