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B. Tech 1st 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) Explain principle, working and characteristics of Photo diode. (6)

   (b) What do you mean by rectifier efficiency and ripple factor as applied to a rectifier? Derive the expression for the same in case of full wave rectifier. (6)

2. (a) Explain the action of Zener diode as a voltage regulator. (6)

   (b) What is a P-N junction?. Explain the potential barrier of a P-N Junction. (6)

SECTION - B

3. (a) Explain the operation of transistor as an amplifier. (6)

   (b) The reverse saturation current in NPN transistor in common base configuration is 15.5 μA. For an emitter current of 4mA, collector current is 2.47 mA. Find the value of current gain and base current. (6)

4. (a) Describe the construction, working and characteristic of N-Channel enhancement MOSFET. (6)

   (b) What are the advantages and disadvantages of FET over a conventional bipolar junction transistor? (6)

SECTION - C

5. (a) Draw the circuit diagram of phase shift oscillator and explain its operation by deriving expression for frequency of oscillation. (6)

   (b) What is an Oscillator? Enumerate the different classes of oscillators. (6)

6. (a) Draw the schematic diagram of summing or adder amplifier. Derive the expression of the output voltage. (6)

   (b) Describe the inverting and non-inverting Op-Amps. Derive an expression of voltage gain in each case. (6)

SECTION - D

7. (a) Prove the following Boolean identity:

   $A+(B \cdot C)=(A+B) \cdot (A+C)$ (6)

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

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

   (b) (i) Convert $(0.101)_2$ into a decimal number,

   (ii) Convert $(3A45)_{16}$ into decimal number.

   (iii) Convert $(5000)_{10}$ in hexadecimal number. (6)

SECTION - E

9. (a) Explain the frequency stability in Oscillators. (3)

   (b) Define α and β of a transistor and derive the relationship between them. (3)

   (c) Discuss the effect of temperature on semiconductors. (2)

   (d) Differentiate between zener breakdown and avalanche breakdown. (2)

   (e) Draw and Explain the static characteristic curve of JFET. (2)