[Total No. of Questions - 9] [Total No. of Printed Pages - 2]
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17030(N)

B. Tech 1st Semester Examination

Fundamentals 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 any five questions in all, selecting at least one question from each section A, B, C, and D. Section E is compulsory.

SECTION - A

1. (a) With the help of energy band diagram explain metal, insulator and semiconductor. (6)

   (b) Draw and explain the photo-diode. (6)

2. (a) What is diffusion and drift current in semiconductor? (6)

   (b) Draw the circuit of half wave rectifier and explain its working. Also determine the average and RMS value of the output current. (6)

SECTION - B

3. (a) Draw the different characteristic curves for CB configuration. (6)

   (b) Draw the circuit of collector to base bias and explain it. (6)

4. Draw the structure of depletion p-type MOSFET and explain its working. Also draw its characteristic curves. (12)

SECTION - C

5. Draw the circuit of RC phase shift oscillator and determine its frequency of oscillation. (12)

6. Draw the circuit of inverting amplifier and adder using op-amp and determine the expression for output voltage for both. (12)

SECTION - D

7. (a) Implement the X-OR, X-NOR, AND and OR operation using NOR gates only. (6)

   (b) Explain the different type of binary codes. (6)

8. Draw the block diagram of CRO and explain the function of each block. (12)

SECTION - E

9. (a) How p-type semiconductor is formed from intrinsic semiconductor?

   (b) Draw the V-I characteristics of p-n junction diode.

   (c) Draw the circuit of π filter.

   (d) Explain the concept of base width modulation.

   (e) Write the expression of current for FET.

   (f) What is the frequency of oscillation for Hartley oscillator?

   (g) Draw the circuit of voltage buffer using op-amp.

   (h) What is the Bandwidth and output impedance of the ideal op-amp?

   (i) Compare BJT and FET.

   (j) Obtain the 1's complement of 1010101.

   (k) Convert the $(1011101.0101)_2$ into decimal.

   (l) Which biasing is more stable for BJT? (1×12=12)