

0 DEC 2016

16010(D)

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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 $15.5 \mu\text{A}$. 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 Cathode 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)