Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ME) (2018 Batch) (Sem.–3)

BASIC ELECTRONICS ENGINEERING

Subject Code : BTEC305-18

M.Code : 76420

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. Differentiate between intrinsic and extrinsic semiconductors.
2. Draw the reverse bias characteristics of a p-n junction.
3. What do you mean by breakdown diode?
4. Why CE configuration is widely used in amplifier circuits?
5. What is adder or summing amplifier?
6. What do you mean by stabilization?
7. Why the input terminals of an op-amp are named as inverting input and non-inverting input?
8. Convert $(7D2.1A)_{16}$ to its decimal equivalent.
9. Which gates are called used as universal gates and why?
10. Convert $(101010.10)_2$ to octal.

SECTION-B

11. Explain the phenomenon of formation of depletion layer in the p-n junction.

12. A single phase full-wave rectifier uses two diodes, the internal resistance of each being 20Ω. The transformer rms secondary voltage from center tap to each end of secondary is 50 V and load resistance is 980Ω. Find :

    a) The mean load current

    b) Rms load current

    c) Output efficiency

13. The emitter current I_E in a transistor is 3 mA. If the leakage current I_{CBO} is 5μA and $\alpha = 0.95$. Calculate the collector and base current.

14. Draw the block diagram of internal construction of op-amp and explain the function of each block in detail.

15. Minimize the following using K-map :

    $f(A,B,C,D) = \sum m(0,2,4,6,8,10,12,14)$

SECTION-C

16. a) Simplify the following Boolean equation and realize the same using a combination of AND, OR, NOR gates :

    $$Y = (\overline{A} + B)(A + \overline{C})(\overline{B} + \overline{C})$$

    b) Explain the construction and working of RS-flip flop.

17. a) Show that using Boolean algebra and De Morgan's theorems :

    $$\overline{YZ} + \overline{W}\,\overline{XZ} + \overline{W}XY\overline{Z} + WY\overline{Z} = \overline{Z}$$

    b) Explain the working of inverting summer amplifier.

18. Write short notes on **any two** :

    a) Differentiator

    b) Voltage divider bias circuit

    c) Photo diode

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.