

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY**  
**LONERE – RAIGAD - 402 103**  
**End Semester Examination, December - 2017**

Branch: B. Tech.

Semester: I

Subject with Subject Code: Basic Electronics Engineering Marks: 60  
 (EXE105)

Date: 20 / 12 / 2017

Time: 3 Hrs.

**Instructions:-**

- 1 Attempt any Five questions.
- 2 All questions carry equal marks.
- 3 Illustrate your answer with neat sketches, diagrams etc. wherever necessary.
- 4 Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.
- 5 If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.

Q.1. A] Describe essential features of the following bonds: 06

- i) Ionic bond
- ii) Covalent bond
- iii) Metallic bond

B] Explain the classification of materials with electrical engineering point of view. 06

Q.2. Attempt any *two* of the followings:

A] How does the Fermi level changes with increasing temperature in the extrinsic semiconductors (*n*- type and *p* -type)? Sketch the energy level diagram. 06

B] What is Hall effect? Calculate Hall voltage, Hall coefficient and Hall angle. 06

C] Find the built-in voltage for a *Si* P-N junction with  $N_A = 10^{15} \text{ cm}^{-3}$  06

and  $N_D = 10^{17} \text{ cm}^{-3}$  at room temperature with  $n_i = 10^{10} \text{ cm}^{-3}$ .

Q.3 A] Sketch  $V_o$  for the circuit and the input shown in Fig. I. *D* is a 06  
 silicone diode with cut in voltage  $V_v = 0.6 \text{ V}$ .



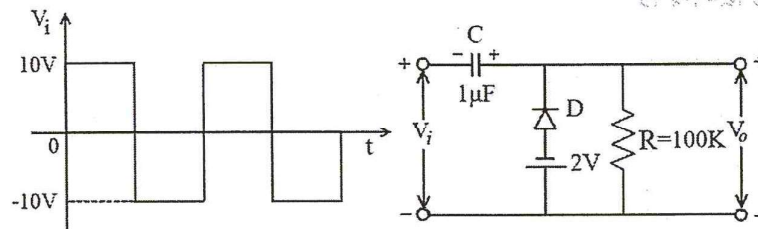


Fig. I

- B] Write a note on depletion layer capacitance and diffusion capacitance. 06
- Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12
- Q.5. Attempt any *two* of the followings:
- A] Describe the working of center tap full wave rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06
- B] Explain different types of resistors in detail. What is the color code for  $1K\Omega$  resistor? 06
- C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06
- Q.6 A] Do as directed: 06
- i) Obtain 2's complement of 10111011
- ii) Add  $(AF1.B3)_H + (FFF.E)_H$
- iii) Determine the floating point representation of  $(-142)_{10}$  using IEEE single precision format.
- B] Explain AND, OR, NAND, NOR, Ex-OR, Ex-NOR logic gates with their logic diagram and truth table. 06

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