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

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Branch: B. Tech.   **Semester: I**

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

Date: 20 / 12 / 2017   **Time: 3 Hrs.**

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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 $N_A = 10^{15} cm^{-3}$ 06

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

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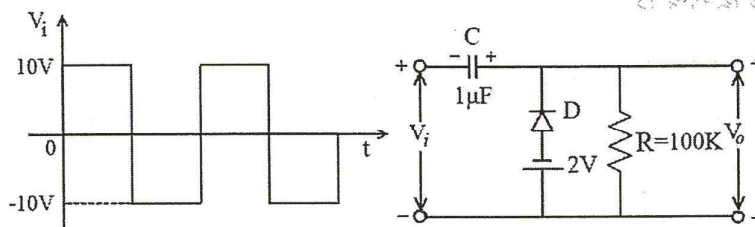
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Fig. I

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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