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 (EXE105) **Marks: 60**

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 $N_A = 10^{15} c\,m^{-3}$ 06

and $N_D = 10^{17} c\,m^{-3}$ at room temperature with $n_i = 10^{10} c\,m^{-3}$.

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 $V_v = 0.6V$. 06

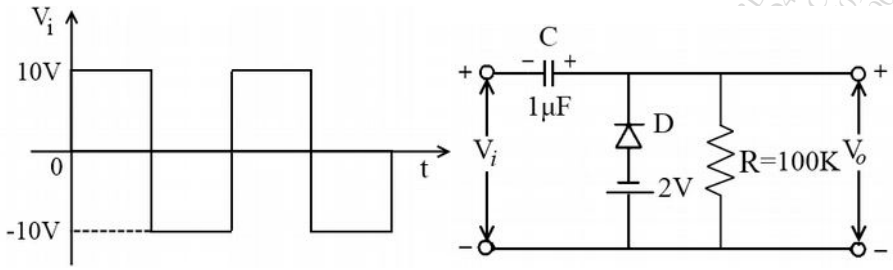

Fig. I

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 1KΩ 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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