

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,  
LONERE – RAIGAD – 402 103  
Summer Semester Examination, May 2018**

**Branch: B. Tech.**

**Subject with Subject Code: Basic Electronics Engineering  
[EXE205]**

**Semester: II**

**Marks: 60**

**Date: 23 / 05 / 2018**

**Time: 3 Hrs.**

**Instructions to the Students:**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.
5. Use of non-programmable calculators is allowed.

**Q.1. A] Describe essential features of the following bonds: 04**

- (a) Ionic bond
- (b) Covalent bond
- (c) Metallic bond

**B] Explain the classification of materials with material science point of view. 04**

**C] Difference between *n*-type and *p*-type semiconductors. 04**

**Q.2. A] Discuss the concept of Hole. 04**

**B] The resistivity of Cu is  $1.72 \times 10^{-8}$  ohm-m. Calculate the mobility of electrons in Cu. Given that the number of electrons per unit volume is  $10.41 \times 10^{28}/\text{m}^3$ . 04**

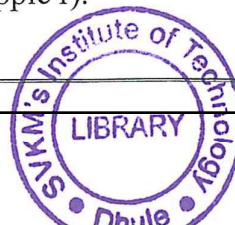
**C] Fermi energy for silver is 5.5 eV. Find out the energy for which the probability of occupancy at 300 K is 0.9. 04**

**Q.3. Attempt any *three* of the followings**

**A] Explain the static and dynamic resistance of a p-n junction diode. 04**

**B] Explain the working principle of a voltage doubler circuit. 04**

**C] If  $V_{\text{rpp}}$  is 10 V and  $V_{\text{dc}}$  is 300 V. Find ripple factor (% ripple *r*). 04**





- D] Distinguish between avalanche and zener mechanism. 04
- Q.4. A] Explain the concept of base-width modulation. 04
- B] Design a fixed bias circuit with  $R_E$  using silicon transistor having  $h_{FE}$  04  
= 100,  $V_{CC}$  is 12 V and dc bias conditions are  $V_{CE} = 6V$ ,  $I_C = 3mA$ .  $V_{BE}$   
= 0.7V.
- C] Discuss the procedure of testing a transistor when its terminals are 04  
unknown.
- Q.5. Attempt any *two* of the followings
- A] List and explain the four physical factors that determine inductor 06  
inductance.
- B] A Coil has a resistance of  $200\Omega$  and an inductance of  $1H$  when measured at 06  
very low frequency. The distributed capacitance is  $200pF$ . Find the  
percentage change in effective inductance when this coil is used at  
frequency of  $1000Hz$ . Also calculate the effective value of inductance.
- C] Draw and explain Permanent Magnet Moving-Coil Instrument. 06
- Q.6. A] Find the octal equivalent of  $(2F.C4)_{16}$  and the hex equivalent of 04  
 $(762.013)_8$ .
- B] Differences between the Combinational and Sequential Logic Circuits. 04
- C] Perform the following addition operations: 04  
(a)  $(275.75)_{10} + (37.875)_{10}$   
(b)  $(AF1.B3)_{16} + (FFF.E)_{16}$

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