

**B. Tech. SEM -II (Computer Science & Business Systems) (CBCS  
2018 Course) : SUMMER - 2019**

**SUBJECT: PRINCIPLES OF ELECTRONICS**

**Day** : Friday  
**Date** : 31/05/2019

**S-2019-2523**

**Time** 10.00 AM To 01.00 PM  
**Max Marks: 60**

**N.B**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

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- Q.1** a) Draw and describe P-types extrinsic semiconductor with atomic structure of silicon material (06)  
b) Describe the concept of majority carriers and minority carrier for N-type and P-type materials. (04)
- OR**
- a) Differentiate between conductors, semiconductors and Insulators with energy band diagram. (06)  
b) Draw the atomic structure of germanium atom and show valence electrons. (04)
- Q.2** a) Discuss the formation of PN junction. What is mean by depletion region? (06)  
b) Describe forward biasing with diagram. (04)
- OR**
- a) Draw the circuit diagram of full wave bridge rectifier and explain its operation with the help of waveforms. (06)  
b) What is mean bay Zener breakdown and Avalanche breakdown in diodes? (04)
- Q.3** a) Describe the operation of NPN transistor in Active region with diagram. (06)  
b) What is current amplification factor for common base and common emitter configuration? (04)
- OR**
- a) Describe the stability factor  $S$ ,  $S'$  and  $S''$  for transistor. (06)  
b) Draw the diagram of voltage divider biasing circuit and state its advantages. (04)
- Q.4** Describe JFET parameters and derive relation between them. (10)
- OR**
- a) Discuss the operation of CMOS as Inverter. (06)  
b) Compare JFET and MOSFET. (04)
- Q.5** a) With the help of neat sketch. Explain the operation of Op-Amp in non-inverting configuration as summing amplifier. (06)  
b) Draw the block diagram for voltage series and current series feedback amplifier. (04)
- OR**
- a) Draw and describe operation of Op-Amp as a subtractor. (06)  
b) Describe the advantages of Op-Amp (04)
- Q.6** a) Why NAND and NOR gates are called universal gates? Implement basic gates using NAND gate. (06)  
b) Show  $A + \bar{A}B = A + B$  (04)
- OR**
- a) Reduce the following function  $F(A,B,C,D) = \sum m(1,3,7,11,15) = d(0,2,5)$  and implement using basic gates (06)  
b) Draw the T-type flip-flop by using S-R flip flop. (04)

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