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

SUBJECT: PRINCIPLES OF ELECTRONICS

Day	:	Friday	**Time**	10.00 AM To 01.00 PM
Date	:	31/05/2019 **S-2019-2523**	**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.

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 **(06)**
$F (A,B,C,D)=\sum m(1,3,7,11,15) = d (0,2,5)$ and implement using basic gates

b) Draw the T-type flip-flop by using S-R flip flop. **(04)**

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