

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2021-COURSE)**  
**B. Tech. Sem - II Computer Science & Business Systems : WINTER- 2022**  
**SUBJECT : PRINCIPLES OF ELECTRONICS ENGINEERING**

Day : Wednesday

Time : 10:00 AM-01:00 PM

Date : 30-11-2022

W-24140-2022

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 **WHEREVER** necessary.
- 5) Draw neat diagram **WHEREVER** necessary.

**Q.1** Draw and explain the atomic structure of Silicon atom with energy band diagram. (10)  
Describe the effect of increase in temperature to the pure semiconductor with neat sketch.

**OR**

**Q.1** Describe the drift current and diffusion current with diagram in detail. (10)

**Q.2** Sketch the V-I characteristics of P-N junction diode. Describe Zener breakdown (10)  
and Avalanche breakdown in detail.

**OR**

**Q.2** Draw and explain the working of Half Wave Rectifier with the help of waveforms (10)  
also explain efficiency and ripple factor. State the disadvantages of this circuit.

**Q.3** Explain the working of transistor in common base configuration. Draw input (10)  
characteristic and output characteristics. Also explain current amplification factor  
for CB configuration.

**OR**

**Q.3** a) Describe the operation of fixed bias circuit and derive the equations for  $V_{CE}$  (06)  
and  $I_C$ .

b) Describe the need of biasing circuits. (04)

**Q.4** Describe the construction and operation of n-channel JFET in detail. Also draw (10)  
the drain characteristics and transfer characteristics graph.

**OR**

**Q.4** Define Depletion mode and Enhancement mode MOSFET. Describe the operation (10)  
of n-channel depletion type MOSFET when  $V_{GS}=0V$  and  $V_{GS} < 0V$  &  $V_{GS} > 0V$ .  
Also draw drain and transfer characteristics graph.

**Q.5** Define following OP-AMP parameters, (10)

- i) Voltage Gain
- ii) Input offset voltage
- iii) Slew rate
- iv) Input impedance
- v) CMRR.

**OR**

**Q.5** Describe the effect of positive feedback in amplifier circuit. Explain Barkhausen (10)  
criteria for oscillation.

**Q.6** Design Full Adder and Full Subtractor. (10)

**OR**

**Q.6** Draw and explain the operation of S-R flip-flop and JK-flipflop with truth table. (10)

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