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II Semester Diploma Examination, Oct./Nov.-2019

BASICS OF SEMICONDUCTOR DEVICES

Time : 3 Hours]

[Max. Marks : 100

- Instructions :** (i) Answer any six questions from Part – A. ($5 \times 6 = 30$ marks)
(ii) Answer any seven full questions from Part – B. ($7 \times 10 = 70$ marks)

PART – A

1. Define the following with respect to energy bands in solids : 5
 - (a) Valance band
 - (b) Conduction band
 - (c) Forbidden energy gap
2. Draw and lable NPN Transistor configurations. 5
3. Define Transistor. Describe terminals of the transistor. 5
4. Explain working of CMOS inverter. 5
5. Define the following with respect to J.F.E.T. : 5
 - (a) Transconductance
 - (b) Drain Resistance
 - (c) Amplification factor
6. Classify the IC's based on structure and functions. 5
7. Define intrinsic standoff ratio. Mention applications of U.J.T. 5
8. Summarise characteristics of varactor diode. 5
9. Define : 5
 - (a) Photo emission
 - (b) Photo conduction
 - (c) Photo voltaic effect

**PART - B**

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| 10. | (a) | Lists the types of semiconductors. | 2 |
| | (b) | Sketch and explain V-I characteristics of semiconductor diode in both the bias conditions. | 8 |
| 11. | (a) | Sketch and show Zener diode as a Voltage Regulator. | 7 |
| | (b) | Explain Ideal diode. | 3 |
| 12. | (a) | Explain with diagram working principle of PNP transistor. | 7 |
| | (b) | List the transistor parameters. | 3 |
| 13. | (a) | Construct and explain transistor as an amplifier. | 6 |
| | (b) | Determine relation between α (alpha) and β (beta). | 4 |
| 14. | (a) | Sketch and describe working of P-channel JFET. | 7 |
| | (b) | Tabulate difference between depletion type and enhancement type MOSFET. | 3 |
| 15. | (a) | Explain with neat sketch transfer characteristics of n-channel JFET. | 8 |
| | (b) | List the applications of MOSFET. | 2 |
| 16. | (a) | Explain construction and operation of SCR. | 7 |
| | (b) | Lists the features of Schottky diode. | 3 |
| 17. | (a) | Sketch and explain fabrication of diode. | 6 |
| | (b) | Tabulate advantages of ICs. | 4 |
| 18. | (a) | Sketch and explain construction and operation of photo diode. | 8 |
| | (b) | List the applications of Laser. | 2 |
| 19. | (a) | Explain semiconductor diode parameters. | 5 |
| | (b) | Write a short note on LED lamp. | 5 |
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