

1172**Code : 15EC21T***Register
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II Semester Diploma Examination, Nov./Dec. 2018**BASICS OF SEMICONDUCTOR DEVICES****Time : 3 Hours]****[Max. Marks : 100****Instructions :** (1) Answer any **six** questions from Part – A. ($6 \times 5 = 30$ marks)(2) Answer any **seven** full questions from Part – B. ($7 \times 10 = 70$ marks)**PART – A**

1. Sketch energy-band diagrams of insulator, semiconductor and conductor. 5
2. Compare CE and CC modes of operation of BJT. 5
3. Explain the relevance of heat sinks in BJT applications. 5
4. Explain briefly the working of N-channel JFET. 5
5. CMOS consumes very less power. Justify. Also, list disadvantages of CMOS family. 5
6. Write the features of PIN diode. 5
7. List the advantages and disadvantages of IC's. 5

8. Describe photovoltaic effect with mention on application examples.

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9. Compare LED and photo-diode.

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PART – B

10. (a) What is depletion Region? Explain it.

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(b) Compare the features of an ordinary diode with that of zener diode.

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11. (a) Explain Intrinsic and Extrinsic semiconductor.

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(b) Show how a zener diode can be connected as regulator and explain its working.

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12. (a) Justify the validity of $I_E = I_C + I_B$ in BJT.

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(b) Calculate the value of β (BETA) if the value of $\alpha = 0.9$.

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13. (a) Sketch input characteristics of an NPN transistor in CE mode. Also, define its input resistance.

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(b) Give the constructional features of BJT. Justify why transistor is called as current controlled device.

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14. (a) Sketch drain characteristics of JFET.

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(b) Define μ , g_m and r_d . Deduce relation between them.

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15. (a) Compare BJT with JFET.

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(b) Compare MOSFET with JFET.

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16. (a) Write at least one application for each of the following :

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(i) Varactor

(ii) SCR

(iii) UJT

(iv) Tunnel diode and

(v) Triac

(b) Explain the principle of operation of SCR.

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(a) Write note on Tunnel Diode.

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(b) Outline the symbols of UJT, SCR, Varactor diode, Diac and PIN diode.

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18. (a) Explain the IC classification based on scale of integration.

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(b) Describe the fabrication process of monolithic ICs.

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19. (a) List the features of LASER.

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(b) List the features of LED bulb.

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