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C20-EC–105

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BOARD DIPLOMA EXAMINATION, (C-20)

FEBRUARY/MARCH —2022

DECE - FIRST YEAR EXAMINATION

ELECTRONIC COMPONENTS AND POWER SUPPLIES

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State the factors affecting the capacitance of a capacitor.

2. List the applications of thermistors.

3. Draw the symbols of fuse, MCB and switch.

4. List the advantages of PCB.

5. Distinguish between the N-type and P-type semiconductors.

6. Define doping and give the majority and minority carriers in P-type and N-type semiconductors.

7. Sketch the VI-characteristics of Zener diode.

8. Find the value of β for $\alpha = 0.95$.

9. Distinguish between the JFET and MOSFET.

10. Give the formulas of average value and RMS value of half-wave and centre tapped full-wave rectifiers in terms of peak value V_M.

PART—B

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Explain the colour coding in resistors with an example. 8

(OR)

(b) Classify the capacitors briefly. 8

12. *(a)* *(i)* List the different switches according to mechanism of operation. 4

(ii) Explain the drilling and washing process in making of PCB. 4

(OR)

(b) *(i)* Draw the electromagnetic relay neatly and name its parts. 4

(ii) Explain the different types of soldering methods. 4

13. *(a)* *(i)* Explain the formation of P-type semiconductor with neat diagram. 4

(ii) List the applications of P N diode. 4

(OR)

(b) *(i)* Compare conductor, semiconductor and insulator. 4

(ii) Explain the avalanche breakdown. 4

14. *(a)* Explain the working of CMOS-FET with diagram. 8

(OR)

(b) Draw and explain the drain characteristics of JFET. 8

15. *(a)* Explain the working of half-wave rectifier with neat circuit. 8

(OR)

(b) Compare the performance of half-wave, centre tapped full-wave and bridge full-wave rectifiers in any eight aspects. 8

PART—C

10×1=10

Instructions : (1) Answer the following question.

(2) Each question carries **ten** marks.

16. *(a)* Derive the relation between α, β and γ of a transistor. 7

(b) Find the value of a for I_C = 1.05 mA and I_B = 1.15 mA. 3

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