

7032

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

DECE - FIRST YEAR EXAMINATION

ELECTRONIC COMPONENTS AND POWER SUPPLIES

Time : 3 Hours ]

[ Total Marks : 80

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**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. Define the term capacitance.
2. List any three specifications of inductor.
3. State the need of fuse in electronic equipment.
4. List the materials used in soldering.
5. Define energy level and energy band diagrams.
6. Compare conductors, semiconductors and Insulators in any three aspects.
7. Distinguish between Avalanche and Zener breakdowns.
8. Define alpha, beta and gamma factors.
9. Draw the transfer characteristics of N channel enhancement MOSFET.
10. Define voltage regulation.

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**PART—B**

8×5=40

- 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) Define temperature co-efficient of resistance and explain the effects of temperature on resistance. 8

**(OR)**

(b) Explain the working of thermistor and sensistor. 8

**12.** (a) (i) Classify different relays based on principle of operations and polarization. 4

(ii) List the steps involved in screen. Printing for making PCBS. 4

**(OR)**

(b) (i) Explain the methods of etching, cleaning and drilling of PCB. 4

(ii) Classify switches according to poles and throws. 4

**13.** (a) (i) Explain Semiconductor materials using energy band diagrams. 4

(ii) Describe the construction and working of Zener diode. 4

**(OR)**

(b) (i) Explain the working of PN junction diode with forward biasing. 4

(ii) Explain intrinsic semi-conductors and Fermi level. 4

**14.** (a) Draw and explain the drain characteristics of JFET. 8

**(OR)**

(b) Explain the construction and working of depletion type MOSFET. 8

**15.** (a) Explain the working of full wave bridge rectifier with wave forms. 8

**(OR)**

(b) Explain the operation of transistor shunt voltage regulator. 8

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## PART—C

10×1=10

- Instructions :** (1) Answer the following question.  
(2) The question carries **ten** marks.  
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

**16.** A silicon made NPN transistor is connected in common emitter (CE) configuration, and it is operating in active region. If its collector current ( $I_C$ ) is 10 mA and base current ( $I_B$ ) is 0.1mA

- (a) Find the current amplification factors  $\alpha$ ,  $\beta$ ,  $\gamma$ .  
(b) At room temperature ( $T = 300$  °K),  $I_{CBO}$  value is 10  $\mu$ A. Then find the value of  $I_{CEO}$ .

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