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JAR-003-1271004 Seat No. _____

M. Sc. (ECI) (Sem. I) (CBCS) Examination

December - 2019

Introduction To Electronics Devices And Circuits : Paper - IV

Faculty Code : 003

Subject Code : 1271004

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 Answer the following : (Any **Seven** out of Ten) **14**

(1) If $a = 0.98$ for CE NPN transistor, what will be the value of β

(2) List the different types of filters that are used in rectifier circuit.

(3) List the different method to fabricate Diode.

(4) Give the difference between an ordinary transistor and FET. (2 points each)

(5) What is PIN diode?

(6) Which types of transformer is used in following rectifiers?

(A) Half wave Rectifier

(B) Full wave Rectifier

(7) What is an IDEAL diode? Draw its characteristic graph.

(8) For given BJT $I_B = 10\ uA$ and $\beta = 99$. Calculate I_C, I_E and a.

(9) Draw the Symbol for ENHANCEMENT P – CHANNEL MOSFET and N – CHANNEL JFET.

(10) The energy gap in Insulator is _____ while in Semiconductor it is _____.

2 Answer the following : (Any **Two** out of Three) **14**

(1) Write a note on an Extrinsic semiconductor and explain how P type and N type semiconductors are formed.

(2) Explain in detail the construction, biasing and application of ZENER diode.

(3) What do you mean by Filter circuit in rectifier? Explain all filters in detail.

3 Answer the following : **14**

(1) Explain TUNNEL diode in detail. Show TUNNELING effect using energy band gap theory.

(2) What is PN diode junction capacitance? Write about VARACTOR diode and its applications.

OR

3 Answer the following : **14**

(1) What do you mean by MOSFET? Explain it with necessary diagrams.

(2) Which are the different 2 ports parameters? Explain Hybrid model and its parameters in detail.

4 Answer the following : **14**

(1) What is DC rectifier? Explain WHEATSTONE BRIDGE rectifier circuit in detail.

(2) Explain PN junction diode with its different biasing and V-I characteristics.

5 Answer the following : (Any **Two** out of Four) **14**

(1) What is Transistor? Explain CE mode with suitable circuit and V-I characteristics.

(2) Explain SCHOTTKY diode in detail. Write the difference between Schottky diode and PN diode.

(3) Explain following terms for Semiconductor.

(A) Doping

(B) Charge carriers

(C) Donor

(D) Acceptor

(E) Intrinsic semiconductor

(4) For a: given circuit, Find

(1) Output voltage

(2) Current through Zener diode

(3) Voltage drop across R_s

(4) Load current

$\left[R_S = 5K\Omega,\ R_L = 10K\Omega,\ V_Z = 50V \text{ and source voltage is} (V_s) 120\ V\right]$