KNT/KW/16/5096

Bachelor of Science (B.Sc.) Semester—II (C.B.S.) Examination

ELECTRONICS (Semiconductor Devices)

Compulsory Paper—1

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) **All** questions are compulsory and carry equal marks.

(2) Draw neat and well labelled diagrams wherever necessary.

EITHER

1. (A) Draw the circuit diagram of N-Channel JFET. Explain its working and discuss its output characteristic. 6

Define JFET parameters and state the relation between them. 4

OR

(B) How are FETS classified ? Describe the construction of MOSFET. 3

Explain its working in enhancement and depletion modes. 7

EITHER

2. (A) Draw and explain V-I characteristics of UJT. 5

Describe the working of UJT as relaxation oscillator. 5

OR

(B) Describe the construction of SCR. 3

Draw V-I characteristics of SCR. 3

Define the following terms : 4

(i) OFF State

(ii) ON State

(iii) Breakover Voltage

(iv) Holding Current.

EITHER

3. (A) Explain short circuit and open circuit tests to find hybrid parameters of two port network. 6

Use h-Parameters to represent, CE and CC transistor amplifiers parameter. 4

OR

(B) Draw the circuit diagram of CE transistor amplifier and its hybrid equivalent circuit. 5

Derive an expressions for :

(i) Current gain and

(ii) Voltage gain in terms of hybrid parameters. 5

EITHER

4. (A) What is power amplifier ? Differentiate voltage and power amplifier. 5

Explain the working of complementary symmetry class B push pull amplifier with two power supplies. 5

OR

(B) Explain the working of transformer coupled class A power amplifier and show that its maximum efficiency is 50 %. 5,5

5. Answer any **ten** subquestions :

(A) Why is FET unipolar device ?

(B) What is necessity of SiO_2 layer in MOSFET ?

(C) State the basic difference between JFET and MOSFET.

(D) Draw the diode equivalent circuit of SCR.

(E) What is intrinsic stand off ratio in UJT ?

(F) Sketch V-I characteristics of Diac.

(G) List the different classes of amplifier on the basis of biasing.

(H) Enlist h-parameters of transistor in CB amplifier.

(I) How are DC values represented in transistor ?

(J) What is difference between power transistor and low power transistor ?

(K) How much is the maximum efficiency of class B push pull amplifier ?

(L) State any two drawbacks of class B push pull amplifier. 1×10=10