

Roll No .....

Total No. of Questions : 09]

[Total No. of Pages : 02

J-35[5135]

[2126]

B.Tech. (Semester - 3<sup>rd</sup>)

ELECTRONIC DEVICES AND CIRCUITS (EC - 201)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:



- 1) Section - A is compulsory.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 x 2 = 20)

- a) Draw the Ideal characteristics of the Diode.
- b) With the characteristic curves & write briefly about working of photo diode.
- c) Write the advantages of MOSFET.
- d) In a fixed bias circuit  
 $R_B = 150\text{ k}\Omega$ ,  $R_C = 2\text{ k}\Omega$ ,  $V_{CC} = 12\text{ V}$ , Transistor is silicon with  $\beta = 100$  then find ' $i_B$ '.
- e) Write the advantages of class 'AB' amplifier.
- f) In what type of applications tuned coupling are used.
- g) What is meant by feed back? What type of feed back is used in oscillator.
- h) Write the characteristics of current shunt feedback amplifier.
- i) Draw and explain the general tank circuit of LC oscillator.
- j) Explain Thermal Runway.

P.T.O.

## Section - B

(4 x 5 = 20)

- Q2)** (a) In a diode how the carrier is developed.  
(b) Draw the equivalent circuit of Junction Diode.
- Q3)** Draw the hybrid model of a low frequency small signal voltage Amplifier.
- Q4)** Draw and explain the V-I characteristics of JFET.
- Q5)** A silicon transistor uses potential divider method of Biasing  $V_{CC} = 12V$ ,  $R_1 = 10\text{ k}\Omega$ ,  $R_2 = 5\text{ k}\Omega$ ,  $R_L = 1\text{ k}\Omega$  and  $R_E = 3\text{ k}\Omega$ . Determine the operating point using Thevenin's theorem.
- Q6)** For class A, CE amplifier circuit shown in Figure  $(V_{CE})_Q = 10V$  and  $(I_C)_Q = 500\text{ mA}$ . If the output current varies by  $\pm 250\text{ mA}$  when an input signal is applied at the Base, compute the collector efficiency and over all efficiency.

## Section - C

(2 x 10 = 20)

- Q7)** (a) Why the transistor circuit requires stabilization?  
(b) Derive the stability factor(s) for voltage division method.
- Q8)** (a) Draw the circuit of a class 'B' push-pull amplifier and explain its operation.  
(b) Derive the voltage distortion in push-pull amplifier.
- Q9)** Derive the expression for the frequency of oscillations and condition for sustain oscillations in a Colpitt's oscillator.

◆◆◆◆◆