TEC 301

Roll No.

ODD SEMESTER EXAMINATION 2019-20

B. TECH III SEM (Old Syllabus)

ELECTRONIC DEVICES AND CIRCUITS

[3 HOURS] **[Total Marks: 100]**

Total no. of printed pages: 2

Note: Attempt all the questions
All questions carry equal marks

Q1. Attempt any four parts of the following: **(5*4)**

(a) Why are intrinsic semiconductors not suitable for applications in electronic devices?

(b) What do you understand by miller indices? How is this obtained that describes a plane in a crystal?

(c) Draw and explain the hysteresis curve of magnetic materials?

(d) Copper has FCC structure, and the atomic radius is 1.278 A^0. Calculate the density of Copper crystal. The atomic weight of copper is 63.5 and Avogadro number is 6.023×10^{23}.

(e) Explain paramagnetic and ferromagnetic materials in detail?

Q2. Attempt any four parts of the following: **(5*4)**

(a) Explain the advantage of negative feedback in an amplifier?

(b) Explain emitter follower with advantage and applications?

(c) Discuss the role of Ebers moll model and hybrid pi model used for BJT.

(d) Explain the h-parameter high-frequency model.

(e) For a CE amplifier circuit with h-parameters h_{ie} = 23kW, $h_{re} = 6 \times 10^{-4}$, h_{fe} = 50, h_{oe} = 25 mA/V and load resistance R_L = 4k ohm, source resistance Rs = 10k ohm. Compute A_V, A_I, R_i and R_o.

Q3. Attempt any two parts of the following: **(10*2)**

(a) What is the relation between the transfer gain with feedback A1 and that would feedback A? Define negative feedback. List the five characteristics of an amplifier which are modified by negative feedback.

(b) Explain the working of Wein-bridge oscillator with a neat diagram and obtain the condition of oscillations. Discuss the frequency range limitation seen in various sine wave oscillators.

(c) Draw the circuit and explain the operation of UJT oscillator? Write the advantage and disadvantage of this oscillator?

Q4. Attempt any two parts of the following: **(10*2)**

(a) What is the multistage amplifier circuit? Show that the overall gain is given by the product of the gains of different stages.

(b) Draw the circuit and explain the operation of the Darlington amplifier? Write the advantage and disadvantage of this amplifier? What is the bootstrapping in this amplifier?

(c) Explain the working of Double Tuned voltage amplifier with a suitable diagram; the voltage Gain of a cascaded amplifier is 100 Db. Determine the value of the input signal if 20 v output is desired from this amplifier?

Q5. Attempt any two parts of the following: **(10*2)**

(a) Explain the operation of Astable multivibrator? Explain the Switching time and frequency of oscillation for this multivibrator?

(b) Explain monostable multivibrator as a frequency divider. Why is monostable multivibrator is called delay circuit?

(c) State the role of commutating capacitors in Bistable multivibrator. Explain the unsymmetrical triggering and symmetrical triggering of the Bistable multivibrator. Where are Bistable multi vibrator applied?
