R09

Code: 9A04301

B.Tech II Year I Semester (R09) Supplementary Examinations December 2015

ELECTRONIC DEVICES & CIRCUITS

(Common to EIE, E.Con.E, ECE, ECC, CSS, IT, CSE, EEE & MCT)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) Explain the volt ampere characteristics of PN diode.
(b) Write the diode equation and discuss the effect of temperature on diode current.

2 (a) Derive the expression for ripple factor in a full wave rectifier using an inductor filter.
(b) Compare the performance of Series inductor, L-Section and π - Section filters.

3 (a) A transistor operating in CB configuration has I_C = 2.98 mA, I_E = 3.00 mA and I_{CO} = 0.01 mA. What current will flow in the collector circuit of this transistor when connected in CE configuration with a base current of 30 μA.
(b) What is early effect? How does it modify the V-I characteristics of a BJT.

4 Explain how to minimize the percentage variations in I_C due to variations in I_{CO}, V_{BE} and β with suitable circuit diagrams.

5 (a) Draw the biasing circuit suitable for JFET and if the JFET is replaced by a MOSFET, for what mode of operation it is valid and explain about the function of each component used in the circuit.
(b) For an n-channel silicon FET with a = 3×10^{-4} cm and $N_D = 10^{15}$ electrons/cm^3. Find the pinch off voltage.

6 (a) Explain the small signal equivalent circuit of common source amplifier.
(b) In the CS amplifier, R_D = 5 kΩ, R_G= 10 MΩ, r_d= 35 kΩ and μ = 50. Find the voltage gain, impedance and output impedance.

7 Explain the following determination method of transistor h – parameters:
(a) Graphical Determination.
(b) Experimental Determination.

8 (a) Draw the equivalent circuit of UJT and explain.
(b) Explain the construction of thermistor.

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