Code: 15A04301 **R15**

B.Tech II Year I Semester (R15) Regular & Supplementary Examinations November/December 2017

ELECTRONIC DEVICES & CIRCUITS

(Common to EEE, ECE and EIE)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Define static and dynamic resistance of diode.
(b) List the applications of zener diode.
(c) What is rectifier?
(d) List out different filters used in association with rectifiers.
(e) Define alpha and beta DC amplification factors of BJT.
(f) Compare BJT and FET.
(g) What is the need of biasing?
(h) What is thermal runaway?
(i) Draw BJT transistor small signal low frequency hybrid model.
(j) Draw JFET transistor small signal low frequency hybrid model.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) With neat diagrams, explain the operation of p-n junction diode considering different biasing conditions.
(b) Illustrate V-I characteristics of p-n junction diode.

OR

3 Discuss the operation and characteristics of the following:
(a) SCR.
(b) UJT.

UNIT – II

4 (a) With the help of a neat circuit diagram, input and output waveforms, describe the operation of Half-wave rectifier.
(b) Derive the expressions for ripple factor and maximum efficiency of HWR.

OR

5 (a) Design a Full-wave center-tap rectifier with capacitor filter and then explain its operation.
(b) Derive the expression for ripple factor of a Full-wave center-tap rectifier with capacitor filter and then comment on the result.

UNIT – III

6 Illustrate the input and output characteristics of all three configurations of a BJT transistor. Also give the important equations related to those configurations.

OR

7 (a) Explain the construction and operation of n-channel JFET.
(b) Draw and explain the drain and transfer characteristics of n-channel JFET.

UNIT – IV

8 (a) Design a common emitter BJT circuit with self bias and then explain its operation.
(b) Derive the expression for stability factor S of self bias circuit.

OR

9 List out different FET biasing methods and then explain the same.

UNIT – V

10 By performing generalized analysis of transistor amplifier, derive the expression for different gains and impedances.

OR

11 (a) Design and analyze common source JFET amplifier for its gains and impedances.
(b) Compare CE, CB and CC amplifiers.

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