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Question Paper Code: AEC001



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Four Year B.Tech III Semester End Examinations (Regular) - November, 2018

Regulation: IARE – R16

ELECTRONIC DEVICES AND CIRCUITS

Time: 3 Hours

(Common to ECE | EEE)

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) Derive the expression for diode equation with neat sketches. [7M]
(b) Explain semi-conductors, insulators and metals classification using energy band diagrams. [7M]
2. (a) Explain how Zener diode can act as a Voltage Regulator. [7M]
(b) How a PN junction diode works? Sketch and explain the V-I characteristics of PN diode with a neat diagram. [7M]

UNIT – II

3. (a) Draw a neat diagram and explain the operation of full wave bridge rectifier. [7M]
(b) List the types of filters used in rectification. Derive the expression for ripple factor using C-filter. [7M]
4. (a) What is Rectification efficiency? Derive expression for the following [7M]
 i. Half wave rectifier
 ii. Full wave rectifier
(b) Explain the construction and working of Tunnel diode. [7M]

UNIT – III

5. (a) Describe the working principle of MOSFET in enhancement mode. [7M]
(b) Compare CE, CB and CC configurations. Distinguish between BJT and FET devices. [7M]
6. (a) Compare and contrast construction of JFET with MOSFET. Sketch the circuit symbols of all MOSFETs [7M]
(b) Sketch the drain characteristics of a n-channel JFET and Explain it. [7M]

UNIT – IV

7. (a) Sketch the selfbias circuit with BJT. Derive expressions for stability factor “S”. [7M]
(b) What is stability factor? Discuss the factors that cause instability of biasing circuit. [7M]
8. (a) Discuss the need for biasing a transistor. Illustrate the DC load line analysis of BJT. [7M]
(b) Sketch and illustrate various biasing techniques of JFET. [7M]

UNIT – V

9. (a) Give the complete analysis of CB transistor amplifier circuit using h-parameters. Derive expressions for the current gain, voltage gain, input impedance and output admittance. [7M]
(b) Sketch the h-parameters equivalent circuit for a common emitter amplifier and derive the expression for A_i , R_i , A_v . [7M]
10. (a) Describe the analysis of generalized transistor amplifier circuit using h-parameter model. Derive the equation for input impedance, voltage gain and output admittance. [7M]
(b) Derive the expressions for Z_i , Z_o and A_v for common source J-FET amplifier. [7M]

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