



B.Tech I Year I Semester Regular Examinations, July 2021
ELECTRONIC DEVICES

(Electronics and Communication Engineering)

Maximum Marks: 70

Date: 14.07.2021 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 What is Space Charge Region? Explain?
- 2 Explain Drift and Diffusion currents in a diode.
- 3 Explain about Zener breakdown.
- 4 Explain, how doping concentration and reverse breakdown voltage of a diode are related.
- 5 Define the terms (i) Ripple factor (ii) Peak Inverse Voltage
- 6 Explain the necessity of filter circuit after rectifier circuit.
- 7 Explain, how transistor works as an amplifier.
- 8 Define Transistor? Draw its symbol and explain it.
- 9 What is Pinch-off voltage?
- 10 Justify, how FET acts as Voltage Variable Resistor?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 a) Draw and explain V-I Characteristics of PN Junction diode.
b) Explain about current components in a pn diode. [5+5]
- OR
- 12 a) Define diffusion capacitance in a P-N junction diode? Discuss its dependence on diode biasing. [6+4]
b) The reverse saturation current of a silicon PN junction diode is 10 mA. Calculate the diode current for the forward-bias voltage of 0.6 V at 25 °C.
- 13 a) Explain how a variable capacitance can be built using a varactor diode. [6+4]
b) Zener diode can be used as Voltage regulator. Justify.
- OR
- 14 a) With the help of V-I Characteristics, explain SCR Operation ?
b) Discuss the negative resistance property of tunnel diode. [6+4]
- 15 a) Explain the operation of a HWR with relevant waveforms. Comment on its ripple factor as compared to FWR.
b) Compare C, L, L-Section, Π - Section filters? [6+4]
- OR
- 16 a) Explain the L - section filter with necessary diagrams.

b) Define the following terms of rectifier and filter. [6+4]

- i) Ripple factor
- ii) Regulation
- ii) Rectification efficiency
- iv) Form factor

17 a) Explain the working principle of NPN transistor with respect to its operating regions.
b) Discuss the need for biasing a transistor. Briefly explain about fixed biasing technique.
[5+5]

OR

18 a) Illustrate input and output characteristics of BJT in CE configurations.
b) Compare CE, CB & CC Configurations? [6+4]

19 a) Draw and explain the typical transfer characteristics of an n-channel JFET .
b) Compare BJT and FET. [6+4]

OR

20 Describe the construction and working principle, characteristics of Enhancement mode and explain how is it different from Depletion MOSFET. [10]