

R22

Code No: 182AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year II Semester Examinations, January/February - 2024

ELECTRONIC DEVICES AND CIRCUITS

**(Common to ECE, CSE, EIE, IT, CSIT, CE(SE), CSE(CS), CSE(AI&ML), CSE(DS),
CSE(IOT), AI&DS, AI&ML, CSD)**

Time: 3 Hours

Max. Marks: 60

Note: This question paper contains two parts A and B.

i) **Part- A** for 10 marks, ii) **Part - B** for 50 marks.

- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of **ten questions** (numbered from 2 to 11) **carrying 10 marks each**. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART - A

(10 Marks)

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|------|--|-----|
| 1.a) | What is diode? | [1] |
| b) | Define cut-in voltage. | [1] |
| c) | What is rectifier? | [1] |
| d) | What is peak inverse voltage in half wave rectifier? | [1] |
| e) | Draw the symbols of NPN and PNP transistor. | [1] |
| f) | Define saturation region. | [1] |
| g) | List the important features of FET. | [1] |
| h) | What is MOSFET? | [1] |
| i) | What is the working principle of photo diode? | [1] |
| j) | Write the applications of varactor diode. | [1] |

PART - B

(50 Marks)

- | | | |
|-----------|---|-------|
| 2.a) | What is the effect of forward and reverse biasing of p-n junction on the depletion region? Explain with necessary diagrams. | |
| b) | Derive the expression for Diffusion capacitance of diode. | [5+5] |
| OR | | |
| 3.a) | How diode acts as switch and explain the transistor switching times. | |
| b) | Explain the different types of semiconductors in detail. | [5+5] |
| 4.a) | What is half-wave rectifier, draw and explain the input and output wave forms. | |
| b) | Define the following terms of full-wave rectifier.
i) Peak inverse voltage ii) efficiency iii) ripple factor? | [5+5] |
| OR | | |
| 5.a) | Describe the operation of full-wave rectifier with neat diagram. | |
| b) | What is clamper and explain the types of clampers and relevant wave forms. | [5+5] |

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- 6.a) Explain the principle and operation of BJT and types.
b) Write a short note on transistor switching times with equations. [5+5]

OR

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- 7.a) Explain the input and output characteristics of CE configuration.
b) Give differences between the CB, CE, CC configurations. [5+5]

- 8.a) What is JFET? Explain the operation of JFET.
b) What are the advantages of FET when compared to BJT? [5+5]

OR

- 9.a) How FET act as voltage variable resistor?
b) Compare enhancement and depletion modes of a MOSFET with the help of its characteristics and construction. [5+5]

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- 10.a) Explain the working of varactor diode and LED.
b) Explain the V-I characteristics of Zener diode. [5+5]

OR

- 11.a) Write short notes on Schottky diode.
b) Explain the principle and working of tunnel diode with its characteristics. [5+5]

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