Code No: 182AG **R22**

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)

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]

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

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]

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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