Code No: 182AB

R22

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year II Semester Examinations, September - 2023

APPLIED PHYSICS

(Common to EEE, CSE, IT, CSIT, CE (SE), CSE (CS), CSE (DS), 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 photoelectric effect?		[1]
b)	Draw E-K diagram.		[1]
c)	What is Hall Effect?		[1]
d)	List out applications of BJT.		[1]
e)	Define ferroelectricity.		[1]
f)	Draw B-H curve.		[1]
g)	What is Nanotechnology?		[1]
h)	List out few examples for top-down fabrication techniques.		[1]
i)	Illustrate application of optical fiber.		[1]
j)	Explain significance of pumping process.		[1]

PART-B

(50 Marks)

2.a)	Calculate energy of particle exist in one dimensional potential box.	
b)	Derive an expression for effective mass of electron.	[5+5]
	OR	
3.a)	Discuss Kronig-Penney model.	
b)	Describe classification of solids on the basis of band theory.	[6+4]
4.a)	Discuss construction and working mechanism of Solar cell.	
b)	Explain construction and characteristics of P-N Junction diode.	[5+5]
	OR	
5.a)	Describe construction and principle of APD.	
b)	Explain construction of LED.	[6+4]
6.a)	Describe construction and principle of Liquid Crystal Displays (LCD).	
b)	Explain working mechanism of bubble memory devices.	[6+4]
	OR	

7.a) Write a note on multiferroics.
b) Discuss construction and working mechanism of rechargeable ion batteries. [5+5]

8.a) Discuss fabrication of nanomaterial using ball milling method.
b) Distinguish between SEM and TEM. [5+5]

OR

9.a) Describe fabrication of nanomaterial using sol-gel.
b) Write a note on Physical Vapor Deposition (PVD). [5+5]

10.a) Illustrate how optical fiber is used for communication system.
b) With neat diagram, explain construction and principle of Argon ion Laser. [4+6]

OR

11.a) Derive an expression for acceptance angle and numerical aperture.
b) Discuss construction and principle of semiconductor laser. [5+5]

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