R16

Code No: 132AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year II Semester Examinations, August - 2018

ENGINEERING PHYSICS – II

(Common to EEE, ECE, CSE, EIE, IT, ETM)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a)	What is the physical significance of wave function?	[2]
b)	What explains E- K curve?	[3]
c)	What is the formation of extrinsic semiconductors?	[2]
d)	Explain the working principle of PN junction.	[3]
e)	Define Electric Susceptibility and Dielectric constant.	[2]
f)	What is polarization? Mention types of polarizations in dielectrics.	[3]
g)	Define Magnetic Susceptibility and magnetic field intensity.	[2]
h)	What is levitation?	[3]
i)	Why nonmaterial's exhibiting different properties?	[2]
j)	Explain the influence of electromagnetic forces in nanoscience.	[3]

PART-B

(50 Marks)

2.a) Derive Schrodinger time independent wave equation.
b) Explain how Davission-Germer experiment is used to explain the existence of matter waves. [5+5]

OR

3.a) Derive an expression for energy levels of particle enclosed in one dimensional Potential box.
b) How band theory of solids leads to classification of solids in to conductors, semiconductors and insulators. [5+5]

4.a) Calculate the carrier concentration in intrinsic semiconductors.
b) Describe Solar cell with its I-V characteristics. [5+5]

OR

5.a) Explain the principle, construction, working of solar cell.
b) Sketch the energy level diagram of PN junction diode and explain open circuit PN junction. [5+5]

6.a) What is piezoelectricity effect? Describe the process to produce piezoelectric effect in quartz crystal.

b) Explain Ferroelectric effect. Describe the spontaneous polarization of $BaTiO_3$. [5+5]

OR

7.a) Derive an expression for electronic polarizability in dielectrics.

b) Deduce the Clausius-Mosotti relation. [5+5]

8.a) Explain hysteresis curve with domain theory.

b) Explain superconductivity and discuss its applications. [5+5]

OR

9.a) Distinguish between Ferro, anti-ferro and Ferri magnetic materials.

b) Classify the magnetic materials as hard and soft on the basis of hysteresis loop. [5+5]

10.a) How do you synthesize the nonmaterial using Physical Vapor Deposition (PVD) method?

b) Explain surface to volume ratio and quantum confinement in nanomaterials. [5+5]

OR

11.a) Explain the working principle of Scanning Electron Microscope (SEM).

b) Mention the applications of nonmaterial's in Medicine and defence. [5+5]

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