#### JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD B. Tech I Year I Semester Examinations, December - 2018 ENGINEERING PHYSICS (Common to CE, ME, MCT, MMT, AE, MIE, PTM) :: 3 hours Max. Marks: 75

## Time: 3 hours

Code No:151AB

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)	Write short note on friction.	[2]
b)	Discuss about quality factor.	[2]
c)	Write any four properties of standing waves.	[2]
d)	Why the rings are circular in Newton's rings experiment.	[2]
e)	Explain phenomena of total internal reflection.	[2]
f)	Explain transformation of scalars.	[3]
g)	Write the properties of damped harmonic oscillator.	[3]
h)	Explain reflection and transmission process.	[3]
i)	Write short note on diffraction grating.	[3]
j)	Explain losses associated with optical fibers.	[3]

### PART - B

#### (50 Marks)

2.a) b)	Explain Newton's laws and their completeness in describing particle motion. Give an account of forces in nature.	[5+5]
2 a)	Evaluin the method of solving Newton's equations in polar accordinates	
5.a)	Explain the method of solving Newton's equations in polar coordinates.	
b)	Write short note on cylindrical coordinates.	[5+5]
4.a)	Compare working of mechanical harmonic oscillators.	
b)	Discuss about energy decay in damped harmonic oscillator.	[5+5]
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5.	Explain working of damped harmonic oscillator in various conditions like	hoowy
	Explain working of damped narmonic oscinator in various conditions like	
	critical and light damping.	[10]
6.a) b)	Explain reflection and transmission of waves at a boundary.	
	Derive expression for longitudinal wave equation and also write prope	rties of
	longitudinal waves.	[5+5]
	OR	
7 a)	Give an account of standing waves and their Figen frequencies	
(.u)	site an account of stationing waves and then Eigen nequencies.	F

b) Write properties of transverse waves. [5+5]

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8.a)	Explain Fraunhofer diffraction at single slit.	
b)	Discuss about interference of light by wave front splitting.	[5+5]
	OR	
9.a)	Explain principle, theory and working of Michelson interferometer.	
b)	Write short note on resolving power of a grating.	[5+5]
10.a)	Describe construction, principle and working of CO <sub>2</sub> laser.	
b)	Write applications of lasers in various fields.	[5+5]
	OR	
11.a)	Derive an expression for acceptance angle and numerical aperture.	
b)	Give an account of graded and step index fibers.	[5+5]

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