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Code No:151AB

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)

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

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PART - B

(50 Marks)

- 2.a) Explain Newton's laws and their completeness in describing particle motion.
- b) Give an account of forces in nature.

[5+5]

OR

- 3.a) Explain the method of solving Newton's equations in polar coordinates.
- b) Write short note on cylindrical coordinates.
- 4.a) Compare working of mechanical harmonic oscillators.
- b) Discuss about energy decay in damped harmonic oscillator.

[5+5]

[5+5]

OR

5. Explain working of damped harmonic oscillator in various conditions like heavy, critical and light damping.

[10]

- 6.a) Explain reflection and transmission of waves at a boundary.
- b) Derive expression for longitudinal wave equation and also write properties of longitudinal waves.

[5+5]

OR

- 7.a) Give an account of standing waves and their Eigen frequencies.
- b) Write properties of transverse waves.

[5+5]

- 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. [5+5]
b) Write short note on resolving power of a grating.
- 10.a) Describe construction, principle and working of CO₂ laser.
b) Write applications of lasers in various fields. [5+5]
- OR**
- 11.a) Derive an expression for acceptance angle and numerical aperture. [5+5]
b) Give an account of graded and step-index fibers.

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