TED (15) – 2003

(REVISION — 2015)

Reg. No...

Signature ....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

ENGINEERING PHYSICS – II

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I   Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define angular velocity.

2. What is torque ?

3. What is a geostationary satellite ?

4. State and explain Ohms law.

5. Give the definition of one electron volt (eV).   (5×2 = 10)

PART — B

(Maximum marks : 30)

II   Answer any *five* of the following questions. Each question carries 6 marks.

1. A car moves along a circular loop of radius 1 km· at constant speed 720 km/hr. Find its centripetal acceleration.

2. State and explain parallel axes and perpendicular axes theorems.

3. What is orbital velocity of a satellite ? Derive an expression for orbital velocity of an artificial satellite.

4. Describe the series and parallel combination of resistances.

5. Give three characteristics and three applications of LASER.

6. What is meant by photoelectric effect ? Obtain the expression for Einstein's photoelectric equation.

7. Explain the terms nuclear fission, nuclear fusion. Give Einstein's mass energy relation.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

Unit — I

III   (a)   Obtain the relation between linear velocity and angular velocity.   3

(b)   Explain what is meant by banking of roads ? Obtain its Expression. What is meant by super elevation ?   6

Marks

(c) A body moves in a circle of radius 20cm at a speed that increases uniformly.
If the speed changes from 5 m/s to 6 m/s in t = 2s, find its angular acceleration.   6

OR

IV   (a) Define moment of inertia of a body. Write its expression.   3

(b) Obtain the expression for moment of inertia of a ring about an axis passing through its centre and perpendicular to its plane.   6

(c) Calculate the moment of inertia about an axis passing through the centre and perpendicular to the plane of a solid disc of radius 0.1m and mass 10kg.   6

UNIT — II

V   (a) State Newton's Law of Gravitation.   3

(b) What are the different types of satellites ? Give some of the applications of satellites.   6

(c) An artificial satellite revolves round the earth at a height 100 km above the surface of the earth. Find the orbital velocity. R = 6400 km and g = 9.8m/s^2.   6

OR

VI   (a) Define gravitational potential.   3

(b) What is meant by escape velocity of a satellite ? Derive an expression for it.   6

(c) Two spheres each of mass 50 kg are 30cm apart. Find the force of attraction between them. G = 6.671 × 10^{-11} Nm^{2}kg^{-2}.   6

UNIT — III

VII (a) State Biot Savart Law.   3

(b) State and explain Kirchhoff's laws.   6

(c) The resistance of a copper wire of length 100 m and radius 0.3mm is 6Ω. Calculate the resistivity.   6

OR

VIII (a) Describe the principle of shunt resistance.   3

(b) How can a galvanometer converted to a voltmeter. Explain.   6

(c) Find the effective resistance when two resistances 6Ω and 2Ω are connected in series and parallel.   6

UNIT — IV

IX   (a) What is meant by population inversion ?   3

(b) With the help of a diagram explain the working of a He-Ne laser.   6

(c) The energy of a photon is 3.2eV. Find its wavelength.   6

OR

X   (a) Briefly explain nuclear chain reaction.   3

(b) What are the essential components of a nuclear reactor ? Explain the function of each component.   6

(c) Give some of the uses of nuclear reactors.   6