

TED (15/19) -2003
(Revision- 2015/19)

A21-00346

Reg.No.....
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – APRIL -2021.

ENGINEERING PHYSICS-II

(Maximum Marks : 75)

[Time : 2.15 hours]

PART–A

Marks

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

1. What is banking of roads?
2. What is meant by Gravitational Potential?
3. State Ohm's law.
4. Distinguish between nuclear fusion and nuclear fission.
5. What is a moderator?

(3x2=6)

PART - B

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

1. Derive an expression for moment of inertia of a circular disc about
(a) a diameter (b) a tangent.
2. A train has to negotiate a curve of radius 400 m. By how much the outer
rail be raised as compared with the inner rail for a speed of 54 km/hr.
The distance between the rail is 1 m.
3. Derive an expression for the escape velocity. Calculate the escape velocity
on the surface on the earth. Mass of the earth is 6×10^{24} kg.
 $G=6.67 \times 10^{11}$.N m²kg⁻². Radius of earth is 6.4×10^6 m.
4. State Newton's law of gravitation. Derive an expression for acceleration due
to gravity from this law.
5. How can a galvanometer be converted to an ammeter?
6. Describe the laws of combination of resistances.
7. Give Einstein's explanation of photo electric effect.

[4x6 =24]

PART - C

(Answer **any of the three units** from the following. Each full question carries 15 marks)

UNIT I

- III** (a) What is meant by angular velocity? Derive the relation between linear velocity and angular velocity for uniform circular motion. (3)
- (b) Derive an expression for the moment of inertia of a uniform circular disc about an axis passing through its centre and perpendicular to its plane. (6)
- (c) A circular disc of mass 40gm rolls along the ground with a velocity 0.4 m/s. Calculate its total kinetic energy. (6)

OR

- IV** (a) Define centripetal acceleration of a body in uniform circular motion and write the expression for it. (3)
- (b) State and explain parallel axes and perpendicular axes theorem. (6)
- (c) A disc of mass 10 kg and radius 20 cm is rotating about an axis with an angular velocity 100π rad/s. What is the magnitude of angular momentum. (6)

UNIT- II

- V** (a) What is a Satellite? What are the uses of polar satellites. (3)
- (b) Derive an expression for orbital velocity and period of revolution of an artificial satellite. (6)
- (c) An artificial satellite revolves the earth very close to the surface. Calculate the orbital velocity and period of revolution from the following Data. $G=6.67 \times 10^{-11} \text{ Nm}^2\text{kg}^{-2}$. Mass of the earth $M=6 \times 10^{24}$ kg. and the radius of earth $R=6400$ km. (6)

OR

- VI** (a) What is geo stationary satellite? Describe its application. (3)
- (b) Derive an expressions for variation of g with altitude and depth. (6)
- (c) Calculate the height at which a geo stationary satellite revolves above the earth. Acceleration due to gravity is 9.8 m/s^2 . $R=6400\text{km}$. (6)

UNIT- III

- VII** (a) State and explain Biot-Savart's Law. (3)
- (b) With the help of a neat diagram derive the balancing condition of a Wheatstone's bridge. (6)
- (c) A straight current carrying conductor of length 2 m experiences a force of 5 N, when placed perpendicular to a uniform magnetic field 0.5 tesla. Determine the current flowing through it. (6)

OR

- VIII** (a) State Kirchhoff's Laws. (3)
- (b) Describe the principle construction and working of a moving coil galvanometer. (6)
- (c) Two wires have an effective resistance 8 ohm when connected in series and 1.5 ohm when connected in parallel. Find the individual resistances. (6)

UNIT – IV

- IX** (a) What are the advantages of gas laser over solid lasers? (3)
- (b) With the help of a neat diagram. Explain the working of ruby laser? (6)
- (c) State laws of photoelectric effect. Explain the terms threshold frequency and photoelectric work function. (6)

OR

- X** (a) Mention three uses of a nuclear reactors. (3)
- (b) Mention the essential components of a nuclear reactor and explain the working of a power reactor. (6)
- (c) Ultraviolet light of wavelength 280nm is incident on lithium whose work function is 4×10^{-19} J. What is the maximum kinetic energy of the ejected electrons. (6)
