Assignment for
Semester- I to Semester-IV
(2015-2018, 2016-2019, 2017-2020,2018-2021 & 2019-2022)
Physics (GE)

Department of Physics
P. K. Roy Memorial College
Dhanbad

Full Marks: 10

Answer any *TWO* questions of the following

1. Define scalar triple product and vector triple product. Show that scalar triple product of vectors is equal to the volume of a parallelopiped whose sides are given by three vectors.

Or

State and prove the Kepler's laws of planetary motion

2. Discuss the general method of solving second order homogeneous differential equation with constant coefficients.

3. Deduce an expression for kinetic and potential energy for a particle executing simple harmonic motion (S.H.M.). Show that total energy in S.H.M. remains constant.

4. Using Lorentz transformation equations discuss the concept of time dilation and length contraction.

Or

Deduce the relation $Y = 3K(1-2\sigma)$, where Y, K and σ are Young's modulus, bulk modulus and Poisson's ratio respectively.

---xxxxxxxxx--

DEPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-I (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-G.E.-1. P. (PRACTICAL)   *Full Marks: 05*

Give the underlying theory, necessary diagram, procedure and relevant precautions of any one of the following experiments:

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.

2. Determination of the Young's modulus of a wire by Optical Lever method.

3. Determination of value of acceleration due to gravity **g** by Bar Pendulum.

4. Determination of value of acceleration due to gravity **g** Kater's Pendulum.

---xxxxxxxxx--

DEPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-II (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-G.E.-2. T. ELECTRICITY & MAGNETISM

Full Marks: 10

Answer any *TWO* questions of the following

1. State and prove Gauss's law in electrostatics.

2. Define electric potential. Derive electric potential at a point due to a point charge.

3. State Biot-Savart's law and apply it to find the expression for magnetic field at a point due to a straight current carrying conductor.

4. Establish Maxwell's relations for electromagnetic field and explain their physical meaning.

---XXXXXXXXX--

DEPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-II (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-G.E.-2. P. (PRACTICAL)

Full Marks: 05

Give the underlying theory, necessary diagram, procedure and relevant precautions of any **one** of the following experiments:

1. Determination of a low resistance by Carey Foster's Bridge.

2. Verification of Thevenin's theorem.

3. Verification of Norton's theorem.

4. Verification of maximum power transfer theorem.

---XXXXXXXXX--

EPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-III (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-G.E.-3. T. THERMAL PHYSICS AND STATISTICAL MECHANICS

Full Marks: 10

Answer any *TWO* questions of the following

1. Describe first law of thermodynamics and use it to establish a relation between C_P and C_V.

2. Describe Carnot's cycle and obtain an expression for the efficiency of an ideal heat engine working between two temperatures T_1 and T_2.

3. Derive Planck's law of black body radiation. Use this law to establish Wien's displacement law.

4. Deduce Maxwell-Boltzmann statistical distribution law clearly explaining the underlying assumptions

---xxxxxxxxx--

DEPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-III (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-GE-3. P. (PRACTICAL)

Full Marks: 05

Give the underlying theory, necessary diagram, procedure and relevant precautions of any <u>one</u> of the following experiments:

1. Measurement of Planck's constant using black body radiation.

2. Determination of the coefficient of thermal conductivity of Cu by Searle's Apparatus.

3. Determination of the coefficient of thermal conductivity of Cu by Angstrom's Method.

4. Determination of the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.

---xxxxxxxxx--

DEPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-IV (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-G.E.-4. T.   WAVES & OPTICS

Full Marks: 10

Answer any *TWO* questions of the following

1. What are beats? Explain formation of beats analytically.

   Or

   Explain group velocity and phase velocity. Establish a relation between them in a dispersive medium.

2. What is interference of light? Describe Newton's ring experiment with suitable figures. How wavelength of monochromatic light is determined using Newton's rings?

3. Analyze a square wave using Fourier's theorem.

4. Discuss diffraction pattern produced by a narrow single slit.

   Or

   What is polarization of light? Describe with theory production and detection of plane polarized light.

---xxxxxxxxx---

DEPARTMENT OF PHYSICS, P. K. ROY MEMORIAL COLLEGE, DHANBAD
B.Sc. PHYSICS (GE) SEMESTER-IV (2015-18, 2016-19, 2017-20, 2018-21, 2019-22)
ASSIGNMENT FOR INTERNAL EXAMINATION
PHY-GE-4. P. (Practical)

Full Marks: 05

Give the underlying theory, necessary diagram, procedure and relevant precautions of any one of the following experiments:

1. Determination of the refractive Index of the material of a prism using sodium light.

2. Determination of wavelength of sodium light using Newton's Rings.

3. Determination of the wavelength of Laser light using diffraction of single slit.

4. Determination of the resolving power of a plane diffraction grating.

---xxxxxxxxx---