BF—94—2016

FACULTY OF SCIENCE

B.Sc. (First Year) (First Semester) EXAMINATION

OCTOBER/NOVEMBER, 2016

(Old Course)

PHYSICS

Paper I (Phy-111)

(Mechanics and Properties of Matter)

(MCQ + Theory)

(Monday, 24-10-2016)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours*   *Maximum Marks*—10+30=40

N.B. :—(*i*)   Attempt *All* questions.

     (*ii*)   Question No. **1** is MCQ type. Answer MCQs on OMR sheet only.

     (*iii*)   Question No. **2**, Question No. **3** and Question No. **4** are descriptive type.

     (*iv*)   Use OMR sheet for MCQ type questions and separate answer sheet for descriptive type questions.

     (*v*)   Negative marking system is applicable to MCQ questions.

MCQ

1.   Attempt *all* Multiple Choice Questions :   10

   (1)   Kepler's second law of planetary motion is also called as ....

     (*a*)   Law of elliptical orbit   (*b*)   Law of Areas

     (*c*)   Law of Harmonic   (*d*)   Law of Gravitation

                                                            P.T.O.

(2) The gravitational potential at a distance "r" from the mass "M" is ....

(a) $V = -\dfrac{GM}{r^2}$ (b) $V = \dfrac{GM}{r^2}$

(c) $V = -\dfrac{GM}{r}$ (d) $V = \dfrac{GM}{r}$

(3) The unit of surface tension in SI unit is ....

(a) Newton/meter^2 (b) Newton/meter

(c) Newton^2/meter   (d) dyne/cm

(4) The excess pressure inside the liquid soap bubble is :

(a) $\dfrac{2T}{r}$ (b) $\dfrac{4T}{r}$

(c) $\dfrac{T}{r}$ (d) $\dfrac{3T}{r}$

(5) The property possessed by liquid which opposes the relative motion between its different layers is called as ....

(a) Elasticity   (b) Surface tension

(c) Viscosity   (d) Diffusion

(6) Searle's viscometer is used for ....

(a) Determination of elasticity of wire

(b) Determination of surface tension of liquid

(c) Determination of coefficient of viscosity of liquid

(d) None of the above

(7) The viscosity of the gas increases with :

(a) increase in temperature

(b) decrease in temperature

(c) remains unchanged

(d) None of the above

(8) When a beam is clamped horizontally at one end and loaded at other, then ....

(a) Filament of upper surface are shortened and lower surface are lengthened

(b) Filament of upper surface are lengthened and lower surface are shortened

(c) Filaments of upper and lower surface are not changed

(d) None of the above

(9) Bending moment of beam is ....

(a) Inversely proportional to Young's Modulus of the material of beam

(b) Inversely proportional to square of Young's Modulus of material of beam

(c) Directly proportional to square of Young's Modulus of material of beam

(d) Directly proportional to Young's Modulus of material of a beam

(10) The expression for potential at 'P' inside the solid sphere is ....

(a) $V = -GM\left(\dfrac{3a^2 - R^2}{2a^2}\right)$ 　　　(b) $V = GM\left(\dfrac{3a^2 - R^2}{2a^3}\right)$

(c) $V = GM\left(\dfrac{3a^2 - R^2}{3a^2}\right)$ 　　　(d) $V = GM\left(\dfrac{3a^2 - R^2}{3a^3}\right)$

Theory

2. Attempt any *five* of the following questions : 　　　　　10

(i) State Kepler's law of equal areas.

P.T.O.

(*ii*)   State Newton's law of Gravitation.

(*iii*)   Give the expression of excess pressure inside a spherical drop.

(*iv*)   Define critical velocity.

(*v*)   Define Young's Modulus and give the S.I. unit of Young's Modulus.

(*vi*)   Define Bending of Beam.

(*vii*)   State Bernoulli's theorem.

3.   Attempt any *two* of the following questions :   10

    (*i*)   Determine Gravitational potential and field intensity due to uniform solid sphere at a point inside the solid sphere.

    (*ii*)   Determine Poiseuille's equation for the flow of liquid through a tube.

    (*iii*)   Determine difference of pressure on two sides of spherical drop.

    (*iv*)   Explain bending of beam in brief.

4.   Attempt any *one* of the following questions :   10

    (*i*)   Derive an expression of surface tension by Jaeger's method.

    (*ii*)   Describe the depression of a beam supported at the ends and loaded at the centre.