Rayat Shikshan Sanstha's

Rajarshi Chhatarapati Shahu College, Kolhapur

B.Sc.Part-I Semester-I (New CBCS)
Preliminary Examination Oct.2019
PHYSICS Paper-II
DSC- A2 Mechanics II

Day & Date: Thursday 10/10/2019 Time : **3:00pm to 5:00 pm** Maximum Marks: **50**

N.B.1. All questions are compulsory.

2. Figures to the right indicate the full marks.
3. Use of calculators/logarithmic tables is allowed
4. Draw neat diagrams wherever necessary.

Q.1 Select the correct alternative from the following [10]

A) The SI unit of gravitational constant is ---------

i) Nm^2Kg^2 ii) Nm^2Kg^{-2} iii) NmKg iv) Nm^2s^2

B) The period of geostationary satellite is --------- hours.

i) 6 ii) 12 iii) 24 iv)48

C) If the particle moves in a central force field , its ---------- is conserved.

i) velocity ii) torque iii) linear momentum iv) angular momentum

D) The oscillatory motion of a body is heavily damped if the damping force is ----- restoring force.

i) equal to ii) less than iii) much greater than iv) much less than

E) The condition for critically damped motion is ----------

i) $\mu^2 = \omega^2$ ii) $\mu^2 < \omega^2$ iii) $\mu^2 > \omega^2$ iv) $\mu^2 = 1$

F) The total energy of a body performing SHM is 'E' then the avaearge kinetic energy of the body over a period is ----------

i) E ii) E/4 iii) E/2 iv) 2E

G) A stretched wire issaid to be under torsion, if it is ----------

i) twisted ii) loaded iii) bent into an arc iv) elongated

H) The angle of contact for pure water and clean glass is ---------- degree.

i) 0 ii)90 iii)180 iv)140

I) When detergent is added in water its surface tension ----------

i) increases ii) decreases iii) remains constant iv) doubles

j) if T is the surface tension of aliquid then the excess pressure inside the liquid drop of radius r is -----

i) T/r ii) 2T/r iii)4T/r iv) r/T

Q. 2 Attempt ANY TWO of the following [20]

A) Define forced oscillations. Obtain differential equation of forced oscillations. Obtain expression for amplitude of forced oscillations.

B) Define cantilever. Obtain expression for depression of free end of the cantilever loaded with mass m.

C) Explain Searle's method to determine Young's modulus and modulus of rigidity of material of wire.

Q. 3 Attempt ANY FOUR of the following [20]

A) State and explain Newton's law of gravitation.

B) State and explain any two applications of surface tension.

C) State Kepler's laws of planetary motion

D). Obtain relation between surface tension, excess pressure and radius of curvature.

E) State and explain any two applications of satellites.

F) Obtain expression for kinetic and potential energy of particle performing simple harmonic motion.