UNIVERSITY OF THE PUNJAB

First Semester – 2019
Examination: B.S. 4 Years Program

Roll No. in Fig. ....

Roll No. in Words. ....

....

PAPER: Elementary Mechanics
Course Code: PHY-101/11003   Part – I (Compulsory)

MAX. TIME: 15 Min.
MAX. MARKS: 10

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.
Please encircle the correct option. Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed.   (1x10=10)

1) The value of div(curl V) is always
a) Absolutely one   b) zero
c) non- zero   d) none of these

2) The curl of gradient of a scalar is always equal to
a) Absolutely one   b) zero
c) non- zero   d) none of these

3) A stone is thrown upward which rises to height of 600m. The relative velocity of stone with respect to earth will be maximum at
a) 600 m   b) the ground
c) the highest point   d) None of these

4) Two electrons are brought closer together, the potential energy of system will
a) decrease   b) increase
c) zero   d) None above

5) The ratio of gravitational mass to inertial mass is
a) 2:1   b) 1:2
c) 1:1   d) none of these

6) The weight of body at the centre of earth will be
a) mg   b) zero
c) ½ mg   d) infinity

7) In the tug of war team A is slowly being defeated by team B. Network is being done by
a) Team A   b) Team B
c) Both   d) None of above

8) Center of mass of uniform rod of length d lies at
a) d/2   b) d/4
c) 3d/2   d) 2d/3

9) The moment of linear momentum is called
a) Angular momentum   b) impulse
c) torque   d) All of these

10) A 10kg mass is falling freely, the force acting on it will be
a) 48m   b) 49m
c) zero   d) none of these

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First Semester – 2019

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PAPER: Elementary Mechanics

Course Code: PHY-101/11003   Part – II

MAX. TIME: 2 Hrs. 45 Min.

MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q. 2 :write the answers of the following questions   (2 x 10 = 20)

i). P rove that curl(grad ϕ) = 0

ii)What do you mean by coefficient of friction .

iii) In conical pendulum ,what happens to period and speed when $\theta = 0^\circ$

iv)If P.E of a system is zero ,does it mean that force is zero.

v)What are conservative forces? Give two examples.

vi) Differentiate between collision and scattering.

vii)Define angular momentum.

viii)What is inelastic collision. Give its physical significance?

ix)Define divergence of a vector.

x) State Stoke's theorem.

Q3   a) State and prove Gauss's divergence theorem.   (2,5,3)

b) If a vector is curl of another vector, the divergence of such vector is zero .

Q4   a) .State and prove parallel axis theorem?   (2,5,3)

b)If an electron in copper near the lowest possible temperature has kinetic energy of 8.7×10^{-19} J,what is speed of electron?

Q5   a)State three kepler's law of planetary motion and prove law of period?   (6,4)

b) Calculate centre of mass of uniform solid cylinder?