## PSG COLLEGE OF ARTS & SCIENCE
### (AUTONOMOUS)

### BSc DEGREE EXAMINATION MAY 2019
(Second Semester)

Branch – PHYSICS

## MECHANICS

Time: Three Hours                                     Maximum: 75 Marks

### SECTION-A (10 Marks)
Answer ALL questions

ALL questions carry EQUAL marks            (10 x 1 = 10)

1    Dimension of moment of inertia is
(i)   kg.m$^2$                                   (ii)   $ML^2$
(iii) $ML^2T$                                    (iv)  $M^2L^2T^2$

2    The period of a conical pendulum is equal to the period of an ordinary pendulum of the same length when
(i)   $\cos\theta=1$                             (ii)   $\cos\theta=0$
(iii) $\cos\theta=180$                           (iv)  None of these

3    The pressure on a subonerged object acts
(i)   only on the top of the surface of the object
(ii)  perpendicularly on every section of the submerged object
(iii) only on the bottom surface of the object
(iv)  on the top and the sides of the submerged object

4    The Pascal law states that pressure applied at a point for a liquid at rest is _____ in all directions.
(i)   same                                       (ii)   un-same
(iii) not matching                               (iv)  matching but not equal

5    Simplified equation of continuity is
(i)   $A_1V_1=A_2V_2$                            (ii)   $A_1V_2=A_2V_2$
(iii) $A_1V_1=A_1V_2$                            (iv)  $A_2V_1=A_1V_1$

6    According to Bernoulli's equation, where speed is high, pressure will be
(i)   high                                       (ii)   low
(iii) medium                                     (iv)  none of these

7    _____ is the liquid propellants.
(i)   nitrogen                                   (ii)   hydrogen
(iii) chloride                                   (iv)  liquid oxygen

8    _____ materials used to make the satellites.
(i)   aluminium alloy                            (ii)   copper alloy
(iii) cromium alloy                              (iv)  both (i) & (ii)

9    In the D` Alembert's principle,
(i)   applied forces do not appear
(ii)  dynamic system is not included
(iii) forces of constraints do not appear
(iv)  forces of constraints appear

10   If the lagrangian is unchanged, there is conservation of
(i)   linear of momentum                         (ii)   angular momentum
(iii) energy                                     (iv)  parity

## SECTION - B (35 Marks)
### Answer ALL Questions
### ALL Questions Carry EQUAL Marks (5 x 7 = 35)

11  a   Obtain the moment of inertia of a sphere.
OR
   b   Explain the working of bar pendulum.

12  a   Give a brief account on the thrust on an immersed plane.
OR
   b   Explain the changes of pressure with altitude.

13  a   Obtain an expression for the co-efficient of viscocity.
OR
   b   Write down the analogy between liquid flow and current flow.

14  a   Write a short on
       (i) Thrust supplied by the jet
       (ii) Efficiency of the jet.
OR
   b   List out the uses of an artificial satellite.

15  a   Explain the constraints of motion.
OR
   b   Deduce the Lagrange's equation of Atwood machine.

## SECTION - C (30 Marks)
### Answer any THREE Questions
### ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16   Describe the compound pendulum.

17   Explain how will you determine the meta centric height.

18   Deduce the Bernoulli's theorem.

19   Explain the functioning of various stages of rocket.

20   Deduce Langrangian equation from Dc Alembert's principle.

Z-Z-Z                    END