

**SECOND MID TERM TEST -NOV-2022****11 - STD****PHYSICS**

Time : 2.00

Marks : 50

**PART - A****Answer all the Questions****10x1=10**

- If a wire is stretched to double of its original length, then the strain in the wire is
  - 1
  - 2
  - 3
  - 4
- For a given material the rightly modulus is (1/3rd) of Young's modulus Its Passjon ratio is
  - 0
  - 0.25
  - 0.3
  - 0.5
- With an increase in temperature the viscosity of liquid and gas, respectively will
  - increase and increase
  - increase and decrease
  - decrease and increase
  - decrease and decrease
- The Young's modulus for a perfect rigid body is
  - 0
  - 1
  - 0.5
  - infinity
- The wettability of a surface by a liquid depends primarily on
  - viscosity
  - surface tension
  - density
  - angle of contact between the surface and the liquid
- The graph between volume and temperature in Charles's law is
  - an ellipse
  - a circle
  - isobaric
  - isochoric
- When a uniform rod is heated, which of the following quantity of the rod will increase.
  - mass
  - weight
  - center of mass
  - moment of inertia
- Which of the following is not a scalar?
  - viscosity
  - surface tension
  - pressure
  - stress
- If the acceleration due to gravity becomes 4 times its original value, then escape speed.
  - remains same
  - 2 times of original value
  - becomes halved
  - 4 times of original value
- The kinetic energy of the satellite orbiting around the Earth is
  - equal to potential energy
  - less than potential energy
  - greater than kinetic energy
  - zero

**PART - B****Answer any Five Questions:- (Question No: 11 is Compulsory)****5x2= 10**

- Define Poisson's ratio.
- State Archimedes principle.
- What do you mean by capillarity or capillary action?
- Define specific heat capacity and give its unit.



15. State Stefan - Boltzmann law.
16. Why is the energy of a satellite (or any other planet) negative?
17. What are geostationary and polar satellites?
18. Define Weight.

**PART - C**

**Answer any Five Questions:- (Question No: 21 is Compulsory) 5x3= 15**

19. Derive an expression for the elastic energy stored per unit volume of a wire.
20. Derive an equation for the total pressure at a depth 'h' below the liquid surface.
21. A wire of length 2m with the area of cross - section  $10^{-6}m^2$  is used to suspend a load of 980 N. Calculate i) the stress developed in the wire ii) the strain and iii) the energy stored.

(Given  $Y = 12 \times 10^{10}Nm^{-2}$ .)

22. Explain the different types of modules of elasticity.
23. Write down the expression for the Stoke's force and explain the symbols involved in it.
24. Obtain an equation of continuity for the flow of fluid on the basis of consecration of mass.
25. State Pascal's law in fluids and Explain hydraulic lift.
26. Give the expressions for linear, area and volume thermal expansions.

**PART- D**

**Answer all the Questions:- 3x5= 15**

27. A. Explain in the detail Newton's law of cooling.  
(or)  
B. Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using stokes force.
28. A. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.  
(or)  
B. State and prove Bernoulli's theorem for a flow of incompressible, non - viscous, and streamlined flow of fluid.
29. A. Derive the expression for escape speed.  
(or)  
B. Derive an expression for energy of satellite.