V11P

Virudhunagar District

Common Second Mid Term Test - 2023

Standard 11

PHYSICS

Time: 1.30 Hrs. Marks: 50

Part - I

Note: i) Answer all the questions. **10×1=10**

ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1) If the masses of the Earth and Sun suddenly double, the gravitational force between them will

a) remain the same b) increase 2 times

c) increase 4 times d) decrease 2 times

2) An object of mass 10 kg is hanging on a spring scale which is attached to the roof of a lift. If the lift is in free fall, the reading in the spring scale is

a) 98N b) zero c) 49N d) 9.8N

3) If the distance between the Earth and Sun were to be halfed from its present value, the number of days in a year would be

a) 645 b) 129 c) 182.5 d) 730

4) The time period of a satellite orbiting earth in a circular orbit is independent of

a) Radius of the orbit

b) The mass of the satellite

c) Both the mass and radius of the orbit

d) Neither the mass nor the radius of its orbit

5) The young's modulus for a perfect rigid body is

a) 0 b) 1 c) 0.5 d) infinity

6) With an increase in temperature, the viscosity of liquid and gas, respectively will

a) increase and increase b) increase and decrease

c) decrease and increase d) decrease and decrease

7) The Wettability of a surface by a liquid depends primarily on

a) viscosity b) surface tension c) density

d) angle of contact between the surface and the liquid

8) The efficiency of a heat engine working between the freezing point and boiling point of water is

a) 6.25% b) 20% c) 26.8% d) 12.5%

9) According to Bernoulis principle, when a fluid pressure increases, what happens to the speed of the fluid

a) it's stay the same b) it increases more

c) decreases d) none of these

10) What is the thermadynamic principle of working of refrigerator?
a) zeroth law of thermodynamics b) first law of thermodynamics
c) second law of thermodynamics d) all the above

Part - II

Note: Answer any six questions. Question No. 18 is compulsory. **6×2=12**

11) State Newton's Universal law of gravitation.
12) What is geostationary satellite?
13) State Hooke's law of elasticity.
14) Define Poisson's ratio.
15) Distinguish between steamlined flow and turbulant flow.
16) What is meant by 'Thermal equilibrium'?
17) Draw the PV diagram for Isothermal process.
18) Let 2.4×10^{-4} J of work is done to increase the area of a film of soap bubble from 50 cm^2 to 100 cm^2. Calculate the value of surface tension of soap solution.

Part - III

Note: Answer any six questions. Question No. 26 is compulsory. **6×3=18**

19) State Kepler's three laws.
20) Explain the variation of g with altitude.
21) Explain Young modulus of elasticity.
22) The reading of pressure meter attached with a closed pipe is 5×10^5 Nm^{-2}. On opening the valve of the pipe, the reading of the pressure meter is 4.5×10^5 Nm^{-2}. Calculate the speed of the water flowing in the pipe.
23) State Pascal's law in fluids.
24) Obtain an ideal gas law from Boyle's and Charle's law.
25) Define specific heat capacity and give its unit.
26) There are two carnot engines A and B operating in two different temperature regions. For engine A the temperatures of the two reservoirs are 150°C amd 100°C. For engine B the temperatures of the reservoirs are 350°C and 300°C. Which engine has lesser efficiency?

Part - IV

Note: Answer all questions. **2×5=10**

27) State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlied flow of fluid. **(OR)**
Explain in detail Newton's law of coding.
28) Derive Mayer's relation for an ideal gas.
(OR)
Derive an expression for escape speed.
