F.Y.B.Sc. Semester I January 2021
Physics Paper I
Classical Mechanics [USPH101]
Sample Questions

1	A mass M is hung from a string fixed to a rigid support oscillates in the vertical plane. The tension in the string when the string makes an angle θ with the vertical is	
	(a)	Mg
	(b)	Mgsinθ
	(c)	Mgcosθ
	(d)	Mgtanθ.
2	For a body mass 1 Kg undergoing acceleration of 10 m/s^2 in an inertial frame, the net force acting on the body is	
	(a)	0.1 N
	(b)	1 N
	(c)	10 N
	(d)	100 N
3	In spinning the ball in an airflow is due to _____	
	(a)	Poiseuille's law
	(b)	Bernoulli's Principal
	(c)	Equation of continuity
	(d)	Fermat's principal
4	*Stress* is	
	(a)	force divided by the area
	(b)	force causing the deformation divided by the area to which the

		force is applied
	(c)	Internal force divided by the area to which the force is applied
	(d)	force causing the deformation muliplied by the area to which the force is applied
5	*Shear stress* acts	
	(a)	Tangential to the surface of the material
	(b)	Parallel to the surface of the material
	(c)	At any angle to the surface of the material
	(d)	Circular to the surface of the material
6	A lens which is thinner at the centre than the edges is called _____.	
	(a)	Thin lens
	(b)	Thick lens
	(c)	Convex lens
	(d)	Concave lens
7	If two thin plano-convex lenses of the same material placed at distance 4cm apart in a Ramsden's eyepiece then the equivalent focal length is	
	(a)	2 cm
	(b)	3 cm
	(c)	4 cm
	(d)	5 cm
8	For minimum spherical aberration, the two lenses must be at a distance equal to _____.	
	(a)	$d = f_1 / f_2$
	(b)	$d = f_1 + f_2$

	(c)	$d = f_1 - f_2$
	(d)	$d = f_1 \times f_2$
9	The dispersive powers for crown and flint glass are 0.015 and 0.030, if the focal length of one lens 10 cm the focal length of second length is ____ that results in an achromatism.	
	(a)	20 cm
	(b)	10 cm
	(c)	30 cm
	(d)	50 cm
10	In Newton's Ring, the relation between radius of the ring and the wavelength of light is given by ____.	
	(a)	$r \propto \sqrt{\lambda}$
	(b)	$r \propto \sqrt{2\lambda}$
	(c)	$r \propto \sqrt{\lambda/2}$
	(d)	$r \propto 2\sqrt{\lambda}$
11	In general gas equation PV = RT, Van der Waal introduced a correction factor $\frac{a}{V^2}$ in pressure. The term represents	
	(a)	Effective area of molecules
	(b)	Mean velocity of gas molecules
	(c)	Volume occupied by molecules
	(d)	Attractive force between molecules

12	According to Van der Waals' gas equation the critical temperature T_C equal to	
	(a)	$T_C = \frac{8a}{bR}$
	(b)	$T_C = \frac{8a}{9bR}$
	(c)	$T_C = \frac{8a}{12bR}$
	(d)	$T_C = \frac{8a}{27bR}$
13	Internal energy U of an ideal gas is function of _____.	
	(a)	Volume
	(b)	Temperature
	(c)	Pressure
	(d)	Size of molecule
14	Work done during an isothermal process is :	
	(a)	$W = 2.303RT \log_{10} \frac{P_2}{P_1}$
	(b)	$W = 2.303 \log_{10} \frac{P_2}{P_1}$
	(c)	$W = 2.303RT \log_{10} \frac{V_2}{V_1}$
	(d)	$W = 2.303 \log_{10} \frac{V_2}{V_1}$
15	Work done during an isothermal process is :	
	(a)	$W = \frac{R}{\gamma - 1}[T_1 - T_2]$

	(b)	$W = \frac{R}{\gamma - 1}[T_2 - T_1]$
	(c)	$W = \frac{R}{1 - \gamma}[T_1 - T_2]$
	(d)	$W = \frac{1}{\gamma - 1}[T_2 - T_1]$