

S.Y.B.Sc. Semester III December 2020
Physics Paper I
Mechanics and Thermodynamics [USPH301]
Sample Questions

1	A rocket has an exhaust velocity of 2500m/s. The rate at which the fuel must burn to develop a thrust of 10000N is	
	(a)	0.25 kg/s
	(b)	40kg/sec
	(c)	25×10^6 kg/sec
	(d)	4kg/sec
2	A particle is acted upon by a central force given by $\vec{F}(r) = \hat{r} F(r)$. The torque acting on the particle is ,	
	(a)	zero
	(b)	$rF(r)$
	(c)	$r \times F(r)$
	(d)	$F(r)/r$
3	The reduced mass expression of masses m_1 and m_2 can be given as:	
	(a)	$m_1 - m_2$
	(b)	$\frac{m_1}{m_2}$
	(c)	$\frac{m_1 m_2}{m_1 + m_2}$
	(d)	$\frac{m_1 m_2}{m_1 - m_2}$

4	The period of a compound pendulum at the centre of oscillation _____ period at point of suspension.	
	(a)	equal
	(b)	greater
	(c)	lesser
	(d)	no relation
5	Damping force acting on an oscillator depends on ____.	
	(a)	Displacement
	(b)	velocity
	(c)	driving force
	(d)	acceleration
6	The process in which the temperature of the system remains the same is called _____.	
	(a)	Adiabatic process
	(b)	Isothermal process
	(c)	Isochoric process
	(d)	Isobaric process
7	Heat engine is a machine which converts heat into _____.	
	(a)	velocity
	(b)	volume
	(c)	pressure
	(d)	work

8	The efficiency of reversible engine is _____.	
	(a)	Always greater than the irreversible engine
	(b)	Always less than the irreversible engine
	(c)	greater than the irreversible engine only at higher temperature
	(d)	greater than the irreversible engine only at lower temperature
9	A Carnot engine takes heat from source at 327°C and rejects heat to sink at 27°C. The efficiency of engine is _____.	
	(a)	75%
	(b)	50%
	(c)	52%
	(d)	64%
10	If 300 KJ of heat is supplied at a constant fixed temperature of 150 K, the change in entropy will be _____.	
	(a)	0.5 KJ/K
	(b)	0.2 KJ/K
	(c)	2 KJ/K
	(d)	5 KJ/K
11	Third law of thermodynamics deals with behavior of substance at _____.	
	(a)	Low temperature
	(b)	High temperature
	(c)	Absolute zero temperature
	(d)	Moderate temperature

12	When the solid is converted into liquid, the rate of change of pressure is positive if _____.
	(a) $V_2 = 0$
	(b) $V_2 = V_1$
	(c) $V_2 < V_1$
	(d) $V_2 > V_1$
13	All the expansion coefficients tends to _____, when temperature tends to 0 K.
	(a) Very high
	(b) zero
	(c) constant
	(d) unchanged
14	The depression of melting point of ice produced by one atm increase of pressure is _____. [Given : Latent heat of ice = 80 cal/gm, specific volume of ice and water at 0°C are 1.091 cm ³ and 1.0 cm ³]
	(a) 0.75 °C
	(b) 0.075 °C
	(c) 0.0075 °C
	(d) 7.5°C
15	Low-temperature physics is also known as _____.
	(a) isogenics
	(b) biogenics
	(c) Coolant
	(d) cryogenics