No. of Printed Pages : 2 (First Shift) *DA-I–90*

Second Term Unit Test, 2016–17

Sub. : Physics

Time : 1:30 Hrs.] **Class – XI** **[M. M. : 40**

Instructions :

(1) Attempt all questions.

(2) Question Nos. 1-5 carry 1 mark each.

(3) Question Nos. 6-10 carry 2 marks each.

(4) Question Nos. 11-15 carry 3 marks each.

(5) Question Nos. 16 and 17 carry 5 marks each.

1. If $\vec{a} \cdot \vec{b} = 0$, then is it necessary that $\vec{a}$ & $\vec{b}$ be perpendicular to each other?
2. What is impulse? Write its dimensions also.
3. Why a cricketer while taking a catch moves his hands backwards?
4. Why do we slip on a muddy road?
5. A light & a heavy body have the same kinetic energy. Which one will have larger momentum?
6. If $a = 5t + 2$ find v. where a is acceleration & v is velocity.
7. If $\vec{a} = 3i + 4j - 2k$, $\vec{b} = 2i - 2j + k$, find $\vec{a} - \vec{b}$, mod of $\vec{a}$ and mod of $\vec{b}$.
8. State & prove work-energy theorem.
9. Find the maximum speed with which a car of mass 1000kg can take a corner of radius 20m, if $\mu = 0.5$.
10. State & prove conservation of momentum.
11. Prove that second law of motion is the real law of motion.
12. The moment of force f acting at a point p is rxf, $r = 3i + j - 2k$ & $f = i + j + k$, find cross product of r & f.

13. A monkey of mass 40kg climbs on a rope which can with stand a max. tension of 600 N. In which of the following cases the rope will break :
    (a) Monkey climbs up with an acceleration of 6 m/s
    (b) Monkey climbs down with an acceleration of 4 m/s^2
    (c) Monkey climbs up with a uniform spoed of 5 m/s.
14. Show that angle of repose is equal to coefficent of friction also define angle of repose.
15. Show that $\tan \theta = v^2/rg$, for banking of road.
16. What is trajectory? For projectile motion, find t_f, range, max. height & equation of trajectory ?
17. For resolution of two vectors a & b, find :
    resultant (R) & direction θ of vector with resultant.