Tecnun
University of
Navarra

SCHOOL OF ENGINEERING
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EXAMPLES OF ADMISSION QUESTIONS AT TECNUN
PHYSICS

1. A point has a uniformly accelerated rectilinear motion in which the velocity module can be expressed as v = At + B. At the initial instant its velocity is 10 m/s. What is its acceleration if after 10 seconds the velocity is 20 m/s?

   a) 0.5 m/s2
   b) 1 m/s2
   c) 2 m/s2
   d) 2.5 m/s2
   e) 4 m/s2

2. A point moves around a circle with a radius of 12 meters. Its speed has a magnitude that varies with time according to the expression v = 5t + 2. What will be the magnitude of its acceleration at t = 2 s?

   a) 3 m/s2
   b) 5 m/s2
   c) 10 m/s2
   d) 13 m/s2
   e) 15 m/s2

3. A child is about to go down a sled on a track inclined at 30ÿ with respect to the horizontal. If the distance that it will travel to reach the end of the track is 9.8 m, with what speed will it arrive?

   a) 1.9 m/
   sb) 4.9 m/
   sc) 9.8 m/
   sd) 19.6 m/
   s) 30.4 m/s

4. A thread passes over a pulley attached to the ceiling. A mass hangs from each end of the thread. If the masses are 3 and 5 kg respectively, what will be the acceleration of the system?

   a) 2.45 m/s2
   b) 3.52 m/s2
   c) 4.9 m/s2
   d) 9.8 m/s2
   e) 14.7 m/s2
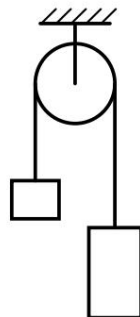
5. Two skaters are standing side by side on an ice rink, initially at rest. They push off from each other and begin to move away from each other. The mass of one of the skaters is 60 kg and the speed with which he starts to move is 1.2 m/s. What will be the speed of the second skater if his mass is 90 kg?

    a) 3.6 m/
    sb) 2.8 m/
    sc) 2.0 m/
    sd) 1.6 m/
    s) 0.8 m/s

6. A spherical solid of mass 5 kg and moving at a constant speed of 7 m/s collides in a perfectly elastic manner with another solid that was at rest. What will be the velocity of the solid that was at rest if, after the collision, the first solid recoils with a speed of 3 m/s?

    a) 1 m/
    sb) 3 m/
    sc) 4 m/
    sd) 6 m/
    s) 10 m/s

7. A spherical mass attached to a string moves around a circle of radius 2 meters at a constant speed. At a given moment the string breaks. What is the speed with which the mass will be ejected if its centripetal acceleration was 8 m/s2 ?

    a) 16 m/
    sb) 12 m/
    sc) 8 m/
    sd) 4 m/
    s) 2 m/s

8. On a road where cars normally travel at 19.6 m/s there is a curve with a radius of 800 meters. What would be the optimal angle ÿ so that vehicles can take the curve safely without friction?

    a) tan ÿ = 0.098
    b) tan ÿ = 0.049
    c) sin ÿ = 0.098
    d) sin ÿ = 0.049
    e) cos ÿ = 0.196

9. A ball is thrown vertically upwards with an initial speed of 2 m/s. Its speed at half of the maximum height is:

    a) 3.27 m/
    sb) 2.83 m/
    sc) 2.45 m/
    sd) 1.96 m/
    s) 1.41 m/s

10. A point moves with kinetic energy Eq. The same object then moves in the opposite direction with a speed five times its initial speed. What will its kinetic energy be now?

    a) ÿ25 Ec

    b) ÿ5 Ec

    c) 5 Ec

    d) 25 Ec

    e) 50 Ec