

MAY JUNE 2017

- b) A stone is dropped into a well and sound of splash is heard after 5 seconds. [6]
Find the depth of the well up to the water level assuming the velocity of sound to be 340m/s.
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DEC 2016

- (c) Two trains starts from Vadala station at the same time. Train A moves with acceleration 5 m/s^2 towards Vashi and train B with acceleration 3 m/s^2 towards Bandra. Tracks from Vadala to Vashi and Vadala to Bandra makes 30° with each other. Determine velocity of train A with respect to train B after 10 seconds. [6]
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DEC 2016

- b. A particle falling under gravity travels 25m in a particular second. Find the distance travelled by it in next three seconds. [5]
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MAY JUNE 2016

- x d. Car A starts from rest & accelerates uniformly on a straight road. Another car B starts from the same place 5 seconds later with initial velocity zero & it accelerates uniformly at 5 m/sec^2 . If both the cars overtake at 500 m from the starting place, find the acceleration of car A. [4]
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DEC 2015

- d) A hot air balloon starts rising vertically up from the ground with an acceleration of 0.2 m/s^2 . 12 seconds later the man sitting inside the balloon releases a stone. Find the time taken by the stone to hit the ground. [4]

- e) A small block rests on a turn table, 0.5m away from its centre. The turn table, starting from rest, is rotated in such a way that the block undergoes a constant tangential acceleration. Determine the angular velocity of the turn table at the instant when the block starts slipping. $\mu=0.4$ [4]
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MAY 2015

- d) Two cars start towards each other from stop X & stop Y at 1:36 PM, the first car reaches stop Y, travelling 8 km path, at 1:44 PM. Second car reaches stop X at 1:46 PM. If they move at uniform velocity, determine their time of meeting & their distance from stop X. 4
- c) A wheel is attached to the shaft of an electric motor of rated speed of 1740 RPM. When the power is turned on, the unit attains the rated speed in 5 seconds & when the power is turned off, the unit comes to rest in 90 seconds. Assuming uniformly accelerated motion, determine the number of revolutions the unit turns: i) to attain the rated speed & ii) to come to rest. 6
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MAY 2014

- d) A sprinter in a 100m race accelerates uniformly for the first 35m and then runs with constant velocity. If the sprinter's time for the first 35m is 5.4 seconds, determine his time for the race. [4]
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DEC 2013

- (d) A motorist is travelling at 90 kmph, when he observes a traffic signal 250 m ahead of him turns red. The traffic signal is timed to stay red for 12 sec. If the motorist wishes to pass the signal without stopping just as it turns green. Determine (i) The required uniform deceleration of the motor. (ii) The speed of motor as it passes the signal. [04]
- (b) In Asian games, for 100 m event an athlete accelerates uniformly from the start to his maximum velocity in a distance of 4 m and runs the remaining distance with that velocity. If the athlete finishes the race in 10.4 sec, determine (i) his initial acceleration, (ii) his maximum velocity. [06]
- (c) A ship A travels in the north making an angle of 45° to the West with a velocity of 18 km/hr and ship B travels in the East with a velocity of 9 km/hr. Find the relative velocity of B w.r.t. ship A. [04]
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MAY 2013

- (b) A stone is thrown vertically upwards and returns to the starting point at the ground in 6 sec. Find out max. height and initial velocity of stone. 6
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