

Note: Calculators are allowed. تنبيه مهم: يسلم الطالب ورقة امتحانية باللغة العربية مع الورقة المترجمة .

First : choose the correct answer from those given:

(١) if a body moves in a straight line so that its position is given by the relation.

$x = 2 + \ln(t + a)$, then the acceleration of motion $a = \dots\dots\dots$

a) $\frac{-1}{t+1}$

b) $\frac{1}{t+1}$

c) $\frac{-1}{(t+1)^2}$

d) $\frac{1}{(t+1)^2}$

(٢) if $v = 3t^2 - 6t$, then the distance covered in the interval $[0, 3]$ equals

length unit

a) zero

b) ٣

c) ٤

d) ٨

(٣) if a body of weight 20 kg rests on a plane inclined to the horizontal at an angle of measure 30° with uniform velocity then the magnitude of the plane resistance equals

a) zero

b) ١٠

c) ١٠ ، ٣

d) ٢٠

(٤) If a body of mass γ kg is suspended in a spring balance inside a lift and the reading of the balance was \wedge kg.wt and the magnitude of the acceleration is a ,
Then

- a) $a = \gamma . \wedge$ m/sec^٢ upwards
 b) $a = -\gamma . \wedge$ m/sec^٢ upwards
 c) $a = -\gamma . \wedge$ m/sec^٢ downwards
 d) $a = \gamma . \wedge$ m/sec^٢ downwards

(٥) In the opposite figure:

If the plan is smooth and the system moves with acceleration a , then $a = \dots\dots\dots$

- a) $\frac{1}{2} g$ b) $\frac{1}{3} g$ c) $1.96 g$ d) $2.45 g$

(٦) If a force $f = (\xi t + \gamma)$ newton acts on a body for a time interval 1 sec , then the Magnitude of the impulse of the force to the body during the ξ th second equals N.sec.

- a) ١١ b) ١٦ c) ٢٧ d) ٤٤

(٧) If a body of weight (W) is projected vertically upwards to collide with the ceiling of room which acts in the body with an impulsive force (f), then the pressure of the body in the ceiling =

- a) f b) $f + w$ c) $f - w$ d) $w - f$

(٨) If a body of mass ٥٠٠ gm moves with velocity $\vec{V} = ٣\hat{i} + ٤\hat{j}$ m/sec, then The kinetic energy of the body equals joule.

- a) ٦٢٥٠ b) ١٢٥٠ c) $\frac{٥}{٤}$ d) $\frac{٢٥}{٤}$

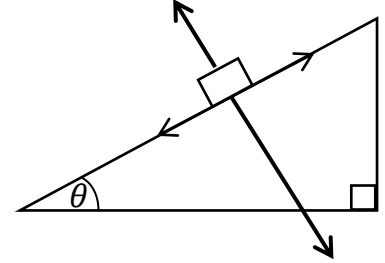
(٩) The work done from the force $F = (٤S^٢ - ٢S + ١)$ Newton to move a particle from the position $S = ٠$ to $S = ٤$ m equals Joule.

- a) ٢٤٤ b) ٢٤٩ c) ٣٩٦ d) ١٠٠٠

(١٠) If a body of mass $\frac{١}{٢}$ km is projected vertically upwards with velocity ١٤ m/sec, then its kinetic energy at the maximum height = Joule.

- a) ٤٩ b) ٩٨ c) ١٠٠ d) ١٢٠

(٢) A body of mass ٦٠ kg descends from rest on the line of greatest slope of an inclined plane whose length is ٢٠ m and its height is ١٢ m . If the body starts motion from the top of the plane and the kinetic coefficient of friction between the body and plane is $\frac{٣}{١٦}$, find the kinetic energy of the body when it reaches the base of the plane.



Complete:

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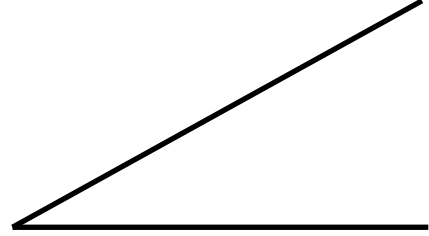
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(٦) A body of mass $\gamma \text{ kg.}$, is let to descend from rest on the line of greatest slope of a rough plane inclined to the horizontal at an angle of $\sin \frac{\gamma}{\delta}$. If the velocity of the body become $\epsilon.\eta \text{ m/sec}$ after $\gamma.\delta \text{ sec}$ from the beginning of motion, find the kinetic coefficient of friction between the body and the plane.

Complete:



(٨) A car of mass 1800 kg and its power engine is 120 horse moves on a straight horizontal road with max velocity 90 km/h. what is the max. velocity by which this car can ascend a road inclined to the horizontal at an angle of $\sin^{-1} \frac{1}{3}$ given that the resistance is the same on the two road?

