نموذج (٨) لامتحان شهادة إتمام الدراسة الثانوية العامة ٢٠٢٥ / ٢٠٢٦ م

المادة : الرياضيات التطبيقية باللغة الإنجليزية (الشعبة العلمية رياضيات) الزمن : ساعتان

أولاً : الأسئلة الموضوعية (الاختيار من متعدد) "كل سؤال درجة واحدة"

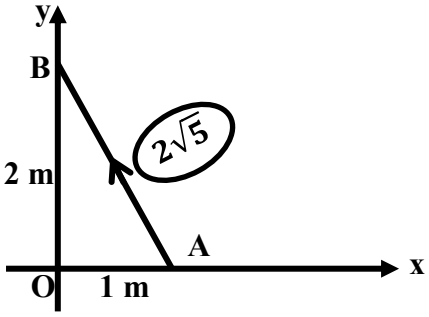
(1) If a particle moves in a straight line such that the algebraic measure of displacement (s) is related to time (t) by the relationship: $s = 100\ t + 200\ e^{\frac{-t}{5}}$, where s is measured in metres, t in seconds, then the algebraic measure of the acceleration of the particle when its algebraic. measure of its velocity becomes 80 m/s equals . . . . . m/sec^2.

(a)	$2 \ln 5$	(b)	$5 \ln 2$	(c)	2	(d)	4

(2) If a body of mass 1 kg moves in a straight line starting from a fixed point "O" and in a constant direction with an initial velocity of 2 m/sec under the action of a force of magnitude $\|\vec{F}\|$ Newton, its algebraic measure which is determined by the relationship: $F = 2s + 5$, where s is the algebraic measurement of its displacement in meters, then the algebraic measure of the speed of the body when S = 1 meter from this point is equal to . . . .. . m/sec.

(a)	1	(b)	2	(c)	3	(d)	4

(3) If a force of magnitude $2\sqrt{5}$ newton acts in the direction shown in the figure, then the moment vector of this force about the origin = ... Newton.m.



(a)	$4\,\hat{k}$	(b)	$-4\hat{k}$	(c)	$6\sqrt{2}\,\hat{k}$	(d)	$-6\sqrt{2}\,\hat{k}$

(4) Two unlike parallel forces of magnitude F Newton and 3F Newton.
If the resultant force is 7 cm away from the larger force, then the distance between the two forces = ... cm.

(a)	7	(b)	14	(c)	21	(d)	28

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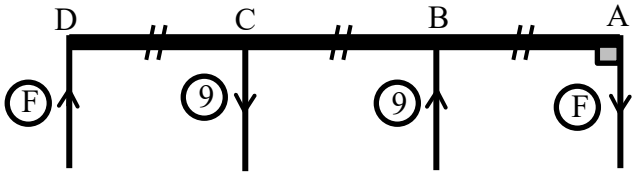
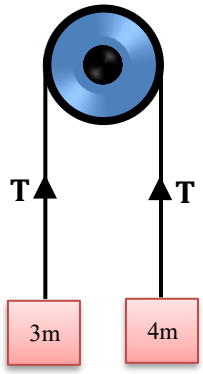
(5)	In the opposite figure: $\overline{AD}$ is a light rod of negligible weight the coplanar parallel forces shown in the figure act on the rod, where the forces is measured in newton, if the rod is in equilibrium and AB = BC = CD, then F = ... Newton. 						
(a)	3	(b)	6	(c)	9	(d)	12

(6)	An object was suspended from a spring balance attached to the ceiling of a lift, it recorded a reading of 17 kg.wt. when the lift was ascending with a constant acceleration of 1.5 $\boldsymbol{a}$ m/sec^2, and a reading of 16 kg.wt. when the lift was descending with a deceleration of $\boldsymbol{a}$ m/s^2, then: The mass of the object is . . . . . kg.						
(a)	14	(b)	15	(c)	16.5	(d)	10

(7)	In the opposite figure: Two bodies with masses of (4m) kg and (3m) kg are hanging on the ends an inextensible light string pass over a small, smooth pulley. If the system moves from rest when the two masses were in the same horizontal plane, then the vertical distance between them after two seconds from the start of the movement = ... meter. 						
(a)	2.8	(b)	9.8	(c)	5.6	(d)	19.6

(8)	If the force $\overrightarrow{F} = 3\,\hat{\imath} + 2\,\hat{\jmath}$ acts in the xy-coordinates plane such that its moment vector about the origin point is equal to 15 $\hat{k}$, then the point of intersection of its line of action with the y-axis is						
(a)	$(0,5)$	(b)	$(0,15)$	(c)	$(0,-5)$	(d)	$(0,-15)$

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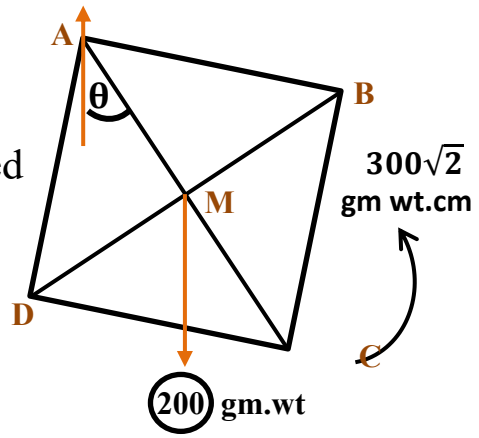
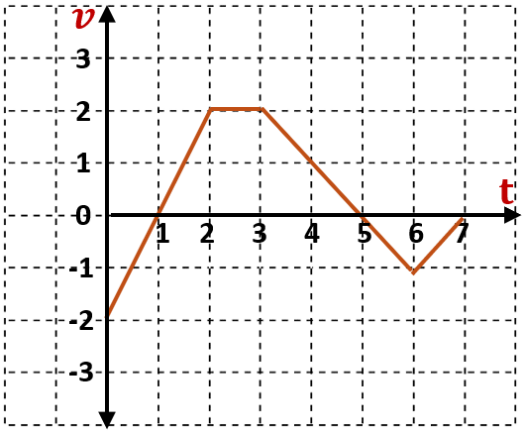
(9) ABCD is a regular thin plate in the shape of a square with a side length of 6 cm and a weight of 200 gm.wt acts at the point where the two diagonals meet, if the plate is suspended from a nail through a small hole near the vertex A such that its plane is vertical and a couple of moment norm $300\sqrt{2}$ gm.wt.cm is applied to its plane, then in the equilibrium position, the measure of the angle of inclination of $\overline{AC}$ to the vertical will be = ...°



(a)	60 or 120	(b)	30 or 150	(c)	45 or 135	(d)	90

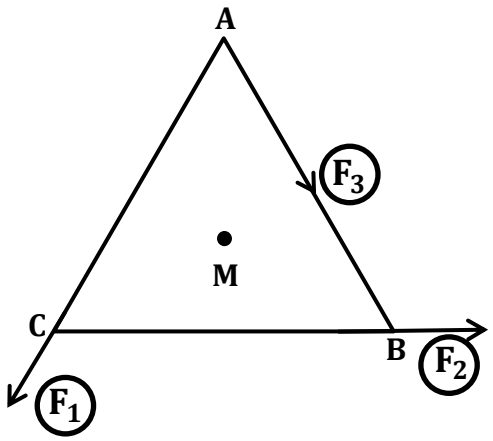
(10) If the opposite figure:
The velocity-time curve represents a body moves in a straight line then the ratio between the magnitude of the displacement and the distance covered by the body during the first seven seconds = ...



(a)	3 : 7	(b)	7 : 3	(c)	7 : 4	(d)	4 : 7

ثانياً : الأسئلة الموضوعية (الاختيار من متعدد) "كل سؤال درجتان"

(11) In the opposite figure:
ABC is an equilateral triangle, M is the point of intersection of its medians. The three forces $\overrightarrow{F_1}$, $\overrightarrow{F_2}$ and $\overrightarrow{F_3}$ acted in the directions shown in the figure. If the sum of the moments of the forces about point M is vanished, then F_3 = ... unit force.



(a)	$F_1 + F_2$	(b)	$F_1 - F_2$	(c)	$\frac{1}{6}\sqrt{3}(F_1 + F_2)$	(d)	$\frac{1}{6}\sqrt{3}(F_1 - F_2)$

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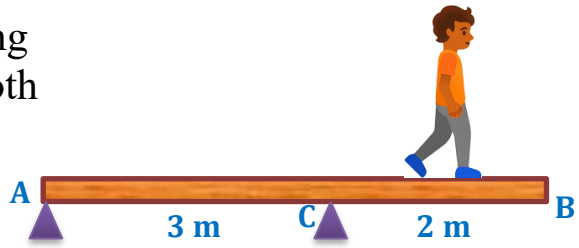
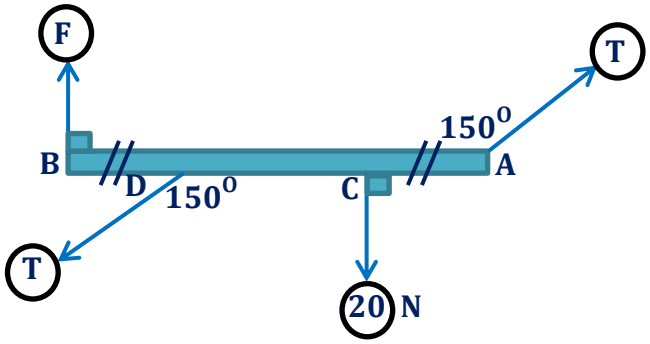
(12)	In the opposite figure: $\overline{AB}$ is a uniform wooden board 5 meters long and weighing 100 kg.wt. rests on two smooth supports, one at point A and the other at point C, where AC = 3 meter. If a child weighing 50 kg.wt. moves from point A towards point B, then the maximum distance the child can move without disturbing the balance of the board is at point A a distance of . . . . . meter.  						
(a)	1	(b)	2	(c)	3	(d)	4

(13)	In the opposite figure: $\overline{AB}$ is a light rod of negligible weight is in equilibrium under the action of the forces shown in the, figure. If AC = DB, then: T + F = ... Newton.  						
(a)	30	(b)	40	(c)	60	(d)	80

(14)	If a variable force $\vec{F}$ (measured in Newtons) acts on a body where $F = 3s^2 - 2s + 1$, s is the algebraic measure of displacement (measured in meter) , then the work done by this force in the interval from s = 1 to s = 3 is equal to . . . . . Joules.						
(a)	9	(b)	12	(c)	20	(d)	24

(15)	$\overline{AB}$ is a uniform rod with a weight of 20 Newton and a length of 60 cm rests at its end A on a rough horizontal plane and rests at a point C on it on a smooth support 25 cm high above the horizontal plane. The rod was about to slide when its angle of inclination to the horizontal was 30°., then the reaction of the support is equals to . . . . . Newton.						
(a)	$3\sqrt{3}$	(b)	$6\sqrt{3}$	(c)	6	(d)	12

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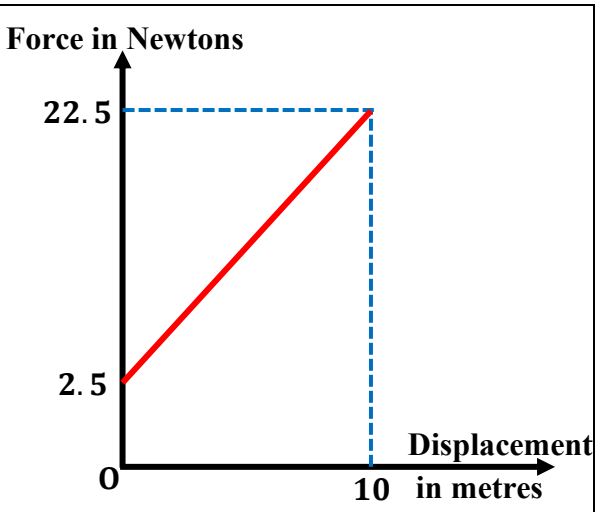
(16)	The figure opposite represents the force-displacement curve for a body with a mass of 2 kg that begins moving in a constant direction with an initial velocity of 10 m/sec., then the speed of the body when its displacement becomes 10 meter is . . . . . m/sec. 							
(a)	10	(b)	15	(c)	20	(d)	25

(17)	If the power of a machine (in horsepower) is equal to $\left(6t - \frac{1}{20}t^2\right)$ where t is the time in second, $t \in [\,0, 120\,]$, then the maximum power of the machine is . . . . . horsepower.						
(a)	100	(b)	120	(c)	180	(d)	240

(18)	A body with a mass of $2\frac{1}{2}$ kg is moving at a constant speed $\vec{v} = 4\hat{\imath}$ A constant force $\vec{F} = 2\,\hat{\imath} + 3\,\hat{\jmath}$ acts on it for 5 seconds, Where the speed is measured in meter per second and the magnitude of the force is in Newton. Then: the speed of the body at the end of this period of time is equal to . . . . . m/sec.						
(a)	8	(b)	6	(c)	10	(d)	14

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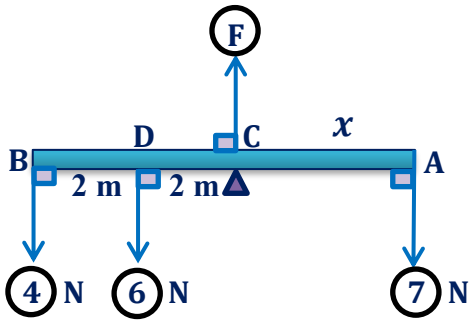
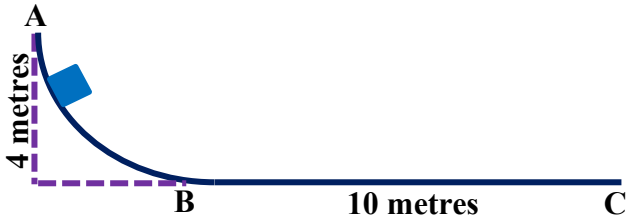
ثالثاً: الأسئلة المقالية " كل سؤال درجتان"

(19)	In the opposite figure: a light rod of negligible weight is in equilibrium under the action of the force shown in the figure Find the value of each of x and F. 
(20)	In the opposite figure: A body with a mass of (m) kg starts sliding from point A on two surfaces, one of which is smooth, represented by part $\overset{\frown}{AB}$ and the other is a rough horizontal surface, represented by part $\overline{B\,C}$.  If the coefficient of kinetic friction is between the body and the rough surface equal to $\frac{1}{2}$, and point A is located at a height of 4 meters from the rough surface, find the maximum distance the body moves on the horizontal plane.

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