رقم المادة : ٤/E٦٠١٢

دمـــج / س

عدد الصفحات (١٤ صفحة) + الغلاف الخارجى + عدد (٣) صفحات مسودة وفقد أية ورقة من الكراسة يعتبر مسئولية الطالب.

جمهورية مصر العربية
وزارة التربية والتعليم والتعليم الفنى
امتحان شهادة إتمام الدراسة الثانوية العامة لطلاب الدمج التعليمي
المادة : الرياضيات التطبيقية (استاتيكا بالإنجليزية) (دمج سمعي)
زمن الإجابة : ساعتان (الإجابة فى نفس كراسة الأسئلة) الدور الأول ٢٠٢٢م

السؤال	الدرجة	توقيع	
		مقدر السؤال	مراجع السؤال
١			
٢			
٣			
٤			
٥			
٦			
٧			
٨			
٩			
١٠			
المجموع			

رقم المراقبة

مجموع الدرجات

مجموع الدرجات بالحروف : .....

إمضـــاءات المراجعيـــن : .....

رقم المراقبة

جمهورية مصر العربية
وزارة التربية والتعليم والتعليم الفنى
امتحان شهادة إتمام الدراسة الثانوية العامة لطلاب الدمج التعليمي
المادة : الرياضيات التطبيقية (استاتيكا بالإنجليزية) (دمج سمعي)
(الإجابة فى نفس كراسة الأسئلة) الدور الأول ٢٠٢٢م

اسم الطالب رباعي / .....

المدرســـة / ..... الإدارة / .....

رقم الجلوس / ..... المحافظة / .....

	الإسم	التوقيع
١-	.....	.....
٢-	.....	.....

توقيع الملاحظين بصحة البيانـات ومطابقة عدد أوراق كراسة الإجابة عند استلامها من الطالب

غير مصرح للطالب بالكتابة في هذه الصفحة

2022

(دمج . س) Arab Republic of Egypt (٦٠١٢) E / ٤ / أول

Ministry of Education

General Secondary Education Certificate Examination – First Session 2022

[Third Year Secondary]

Statics Time: 2 Hours

الاستاتيكا (بالإنجليزية) الدور الأول ٢٠٢٢ (الإجابة فى نفس كراسة الأسئلة)

(الأسئلة فى اربعة عشر صفحة)

Calculator is allowed

First: Choose the correct answer from those given:

(1) A body of weight 16 Newton is placed on a horizontal rough plane and a horizontal force of magnitude 8 Newton acts on it, if the body is about to move, then the coefficient of the static friction between the body and the plane = ...

ⓐ $\frac{1}{2}$ ⓑ $\frac{1}{7}$ ⓒ $\frac{1}{14}$ ⓓ $\frac{1}{21}$

.....

.....

.....

.....

.....

.....

.....

(2) If the force $\vec{F} = 3\hat{\imath} - 4\hat{\jmath}$ acts at the point $A(3,2)$, then the moment of this force $\vec{F}$ about the point $B(-2,1)$ equals .....

ⓐ $23\vec{k}$ ⓑ $-23\vec{k}$ ⓒ $5\vec{k}$ ⓓ $-5\vec{k}$

.....

.....

.....

.....

.....

.....

((بقية الأسئلة فى الصفحة الثانية))

(3) Two parallel forces act in the same direction, their magnitudes 20 , 16 Newton and act at two points A, B respectively where AB=9 cm, if their resultant acts at a point C, then AC = ...cm

ⓐ 4 ⓑ 5 ⓒ 6 ⓓ 7

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4) If the two forces: $\vec{F}_1 = 5\hat{\imath} + L\,\hat{\jmath}$, $\vec{F}_2 = m\hat{\imath} - 3\,\hat{\jmath}$ form a couple, then $L + m =$ .....

ⓐ 2 ⓑ 8 ⓒ -2 ⓓ -8

.....

.....

.....

.....

.....

.....

.....

.....

.....

((بقية الأسئلة فى الصفحة الثالثة))

(5) A, B are two physical bodies their weights are 4 , 8 Newton respectively, if the distance between them is 6 meter, then their center gravity lies at a distance .....meter from the body A

ⓐ 4 ⓑ 6 ⓒ 8 ⓓ 12

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(6) A body of weight 27 kg. wt is placed on a horizontal rough plane, if the measure of the angle of friction between the body and the plane 30° , then the magnitude of the horizontal force which make the body is about to move=.....kg.wt

ⓐ $27\sqrt{3}$ ⓑ $9\sqrt{3}$ ⓒ 27 ⓓ 9

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... *((بقية الأسئلة فى الصفحة الرابعة))*

(7) If the force $\vec{F} = 4\hat{\imath} + 3\hat{\jmath}$ acts at the point $A(2,-1)$, then the length of the perpendicular drawn from point $B(-1,3)$ on the line of action of the force $\vec{F}$ equals ..... Length unit

ⓐ 3 ⓑ 4 ⓒ 5 ⓓ 6

.....

.....

.....

.....

.....

.....

.....

.....

.....

(8) F_1 , F_2 are magnitudes of two parallel forces acting in opposite directions, where $F_1 > F_2$ and their resultant is at a distance 10 cm , 15 cm from the first force and the second force respectively, if the magnitude of their resultant 25 Newton, then:

F_1 = ...Newton , F_2 = ...Newton respectively

ⓐ 50 , 25 ⓑ 75 , 50 ⓒ 10 , 15 ⓓ 15 , 10

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

((بقية الأسئلة فى الصفحة الخامسة))

(9) A rod is hanged to a vertical wall , let x and y are the algebraic perpendicular components of the reaction of the hinge $\vec{R}$ and if $x = a\sqrt{7}$ gm.wt. , $y = a\sqrt{2}$ gm.wt. , R = 21 gm.wt., then the value of a=....., (where $a > 0$)

ⓐ 3 ⓑ 7 ⓒ 9 ⓓ 21

.....

.....

.....

.....

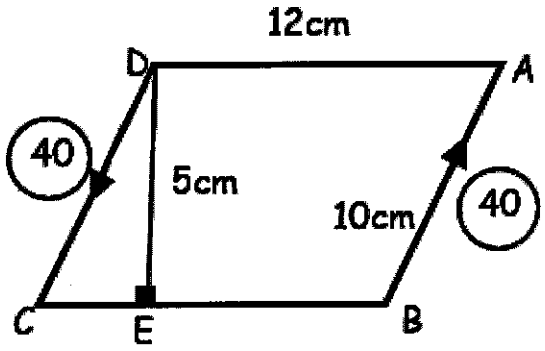
.....

.....

.....

.....

(10) In the opposite figure:
ABCD is a parallelogram,
If the two forces of magnitudes 40, 40 Newton act in directions as shown in the opposite figure , then the algebraic measure of moment of its couple =..... N .cm



ⓐ 240 ⓑ 200 ⓒ −240 ⓓ −400

.....

.....

.....

.....

.....

.....

.....

.....

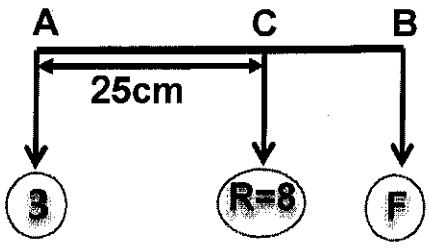
.....

.....

((بقية الأسئلة فى الصفحة السادسة))

(11) In the opposite figure:

Two parallel forces of magnitudes F, 3 Newton, if their resultant is of magnitude 8 Newton, then BC=...cm



ⓐ 15 ⓑ 40 ⓒ 45 ⓓ 50

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(12) If $\vec{F}$ is a force, A and B are two points and $\overrightarrow{M_A} = \overrightarrow{M_B}$, then $\vec{F}$ ..... $\overline{AB}$

ⓐ parallel ⓑ perpendicular ⓒ bisect ⓓ intersect

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

((بقية الأسئلة فى الصفحة السابعة))

(13) If the two forces: $\vec{F}_1 = 5\hat{\imath} - L\,\hat{\jmath}$, $\vec{F}_2 = \hat{\imath} + 3\,\hat{\jmath}$ are parallel, then L = ...

ⓐ 5 ⓑ 3 ⓒ -15 ⓓ -3

.....

.....

.....

.....

.....

.....

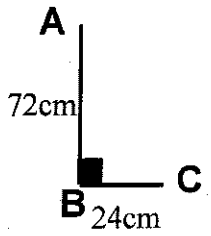
.....

.....

.....

(14) In the opposite figure:

ABC is uniform thickness, density wire in which AB=3BC=72cm, then the distance between the center of gravity of the wire and both of $\overleftarrow{BA}$, $\overleftarrow{BC}$ respectively is .....



ⓐ (1,27) ⓑ (3,27) ⓒ (3,36) ⓓ (12,36)

.....

.....

.....

.....

.....

.....

.....

.....

.....

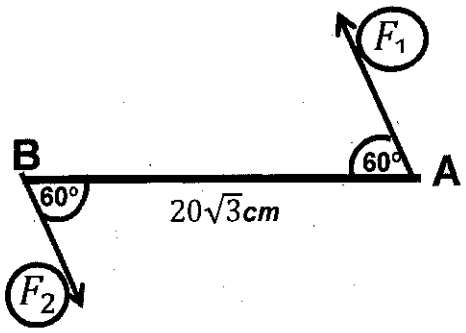
.....

.....

.....

((بقية الأسئلة فى الصفحة الثامنة))

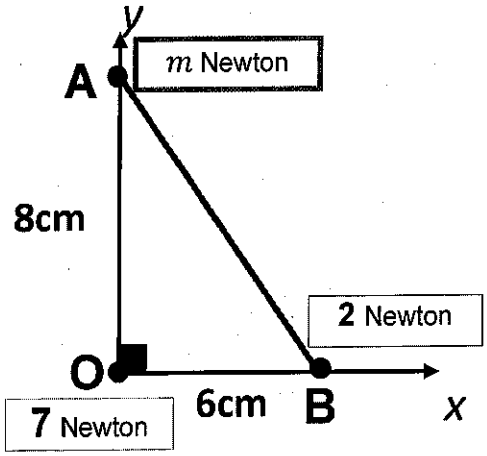
(15) In the opposite figure:
The two forces of magnitudes F_1, F_2 form a couple and the algebraic measure of its moment 210 Newton .cm , then F_1 = ... Newton



ⓐ 21 ⓑ 10 ⓒ 7 ⓓ 3

.....
.....
.....
.....
.....
.....
.....
.....

(16) In the opposite figure:
If the point G(1,2) is the center of gravity of masses of weights m , 2 *and* 7 Newton are fixed at the vertices of Δ ABO as in the figure where O is the origin, then m = ...N



ⓐ 3 ⓑ 4 ⓒ 5 ⓓ 9

.....
.....
.....
.....
.....
.....
.....

((بقية الأسئلة فى الصفحة التاسعة))

(17) If the force $\vec{F} = \hat{\imath} + 2\hat{\jmath}$, its moment about the origin $=6\hat{k}$, then the moment of the force $\vec{F}$ about the point B(-1,3) equals .....

ⓐ $9\hat{k}$ ⓑ $2\hat{k}$ ⓒ $7\hat{k}$ ⓓ $11\hat{k}$

.....
.....
.....
.....
.....
.....
.....
.....
.....

(18) If the force $\vec{F} = \hat{\imath} + 2\hat{\jmath} - 3\hat{k}$ acts at the point A(-1,2,1) , then the moment of the force $\vec{F}$ about the point B(2,-3,-1) equals .....

ⓐ $19\hat{\imath} - 7\hat{\jmath} - 11\hat{k}$ ⓑ $-19\hat{\imath} - 7\hat{\jmath} + 11\hat{k}$

ⓒ $-19\hat{\imath} - 7\hat{\jmath} - 11\hat{k}$ ⓓ $\hat{\imath} - 7\hat{\jmath} - 11\hat{k}$

.....
.....
.....
.....
.....
.....
.....
.....
.....

((بقية الأسئلة فى الصفحة العاشرة))

(19) Center of gravity of a fine lamina in the form of an equilateral triangle of side length 6 cm lies at a distance .....cm from a base of the triangle.

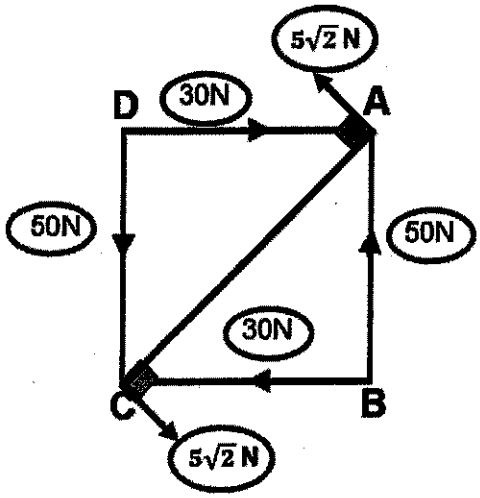
ⓐ $\sqrt{3}$ ⓑ $2\sqrt{3}$ ⓒ 3 ⓓ $3\sqrt{3}$

.....
.....
.....
.....
.....
.....
.....

(20) In the opposite figure:

ABCD is a square of diagonal Length $4\sqrt{2}$cm,

The algebraic measure of the resultant couple =.....N.cm



ⓐ -200 ⓑ 120

ⓒ 80 ⓓ -40

.....
.....
.....
.....
.....
.....
.....

((بقية الأسئلة فى الصفحة الحادية عشر))

Secondly:

Answer the following questions:

(21) $\overline{AB}$ is a uniform ladder of weight 20 kg.wt. rests with its end A on a smooth vertical wall, with its end B on a rough horizontal and the coefficient of the static friction between the ladder and the ground $\frac{1}{2}$

If the ladder is about to slide, find the reaction of the vertical wall on the ladder.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

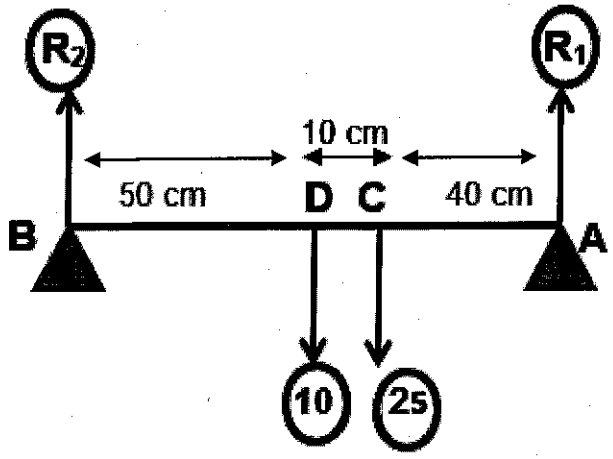
.....

((بقية الأسئلة فى الصفحة الثانية عشر))

(22) A body of weight 15 kg.wt. is placed on an inclined rough plane which makes an angle with the horizontal line of tangent $\frac{3}{4}$, if the coefficient of the static friction between the body and the plane $\frac{1}{3}$, find the least force which acts in direction of the line of the greatest slope of the plane upward to prevent sliding of the body downward.

((بقية الأسئلة فى الصفحة الثالثة عشر))

(23) $\overline{AB}$ is a uniform rod of length 100 cm and weight 10 kg.wt rests horizontally on two supports at its ends, a mass of weight 25 kg.wt is suspended from the point at a distance 60 cm from one of its ends Find the pressure of the rod on each of the two supports.



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

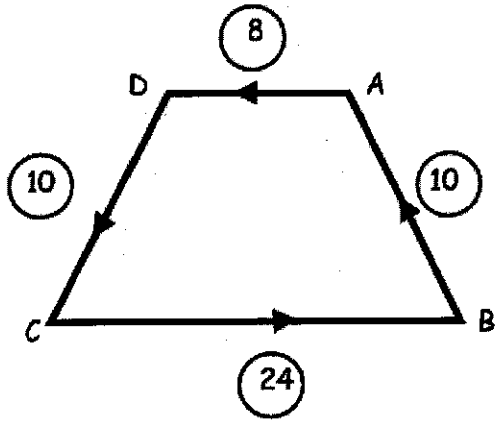
.....

.....

((بقية الأسئلة فى الصفحة الرابعة عشر))

(24) $ABCD$ is an isosceles trapezium in which $\overline{AD}$ // $\overline{BC}$, AB=CD=5 cm , BC=12 cm , AD=4 cm, forces of magnitudes 10 , 24 , 10 , 8 Newton act along its sides in directions $\overrightarrow{BA}$, $\overrightarrow{CB}$, $\overrightarrow{DC}$, $\overrightarrow{AD}$ respectively .

Prove that the system form a couple, then find magnitude of its moment.



.....

.....

.....

.....

.....

.....

.....

.....

.....

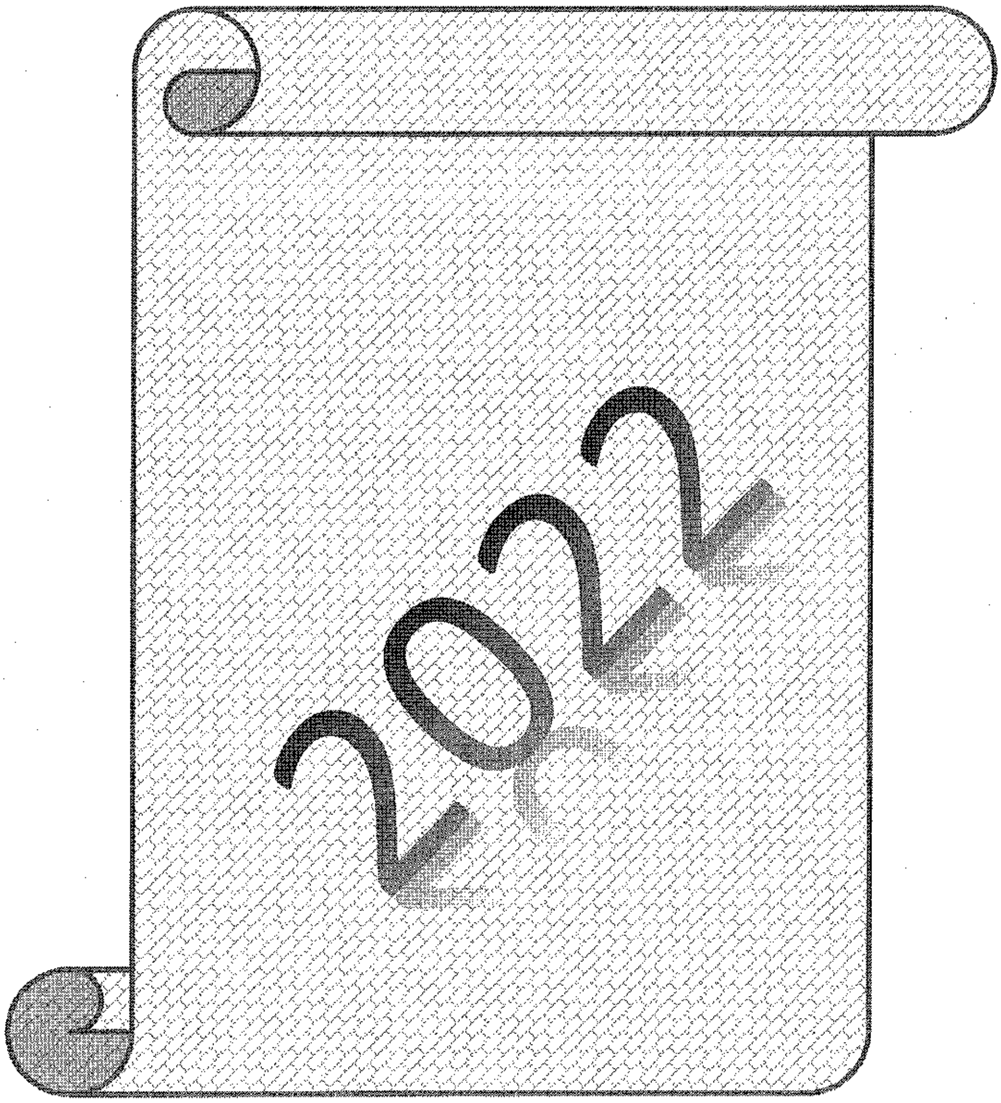
.....

.....

.....

.....

((انتهت الأسئلة))


2022