

جمهورية مصر العربية

وزارة التربية والتعليم والتعليم الفني

امتحان شهادة إتمام الدراسة الثانوية العامة لطلاب الدمج التعليمي

المادة : الرياضيات التطبيقية ( استاتيكا بالإنجليزية ) ( دمج حركي )

الدور الأول ٢٠٢٢ م

( الإجابة في نفس كراسة الأسئلة )

زمن الإجابة : ساعتان

توقيع		الدرجة	السؤال
مراجع السؤال	مقدر السؤال		
			١
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			المجموع

مجموع الدرجات

رقم المراقبة

مجموع الدرجات بالحروف :

امضاءات المراجعين :

رقم المراقبة

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( الإجابة في نفس كراسة الأسئلة )

اسم الطالب رباعيا /

الإدارة /

الدرسة /

المحافظة /

رقم الجلوس /

التوقيع

الاسم

١-

٢-

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

2022

غير مصرح للطالب بالكتابة في هذه الصفحة

2022

غير مصرح للطالب بالكتابة في هذه الصفحة

2022

(دمج . ح )

Arab Republic of Egypt  
Ministry of Education

٦٠١٢ / ٣ / أول

General Secondary Education Certificate Examination – First Session 2022  
[Third Year Secondary]

Statics

Time: 2 Hours

(الإجابة في نفس كراسة الأسئلة)

الدور الأول ٢٠٢٢

الاستاتيكا (بالإنجليزية)

(الأسئلة في أربعة 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 = .....

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

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

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

\*((بقية الأسئلة في 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  $AC = \dots\dots\dots$ cm

(a) 4

(b) 5

(c) 6

(d) 7

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

$L + m = \dots\dots\dots$

(a) 2

(b) 8

(c) -2

(d) -8

\*((بقية الأسئلة في 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

(a) 4

(b) 6

(c) 8

(d) 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  $30^\circ$ , then the magnitude of the horizontal force which make the body is about to move = .....kg.wt

(a)

$27\sqrt{3}$

(b)

$9\sqrt{3}$

(c)

27

(d)

9

(7) If the force  $\vec{F} = 4\hat{i} + 3\hat{j}$  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

(a) 3

(b) 4

(c) 5

(d) 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:

$F_1 = \dots\dots$ Newton ,  $F_2 = \dots\dots$ Newton respectively

(a) 50, 25

(b) 75, 50

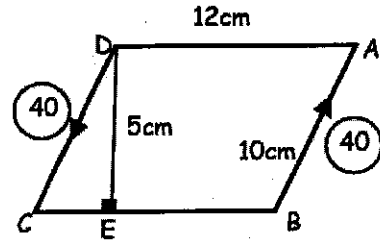
(c) 10, 15

(d) 15, 10

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

- (a) 3                      (b) 7                      (c) 9                      (d) 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



- (a) 240                      (b) 200                      (c) -240                      (d) -400

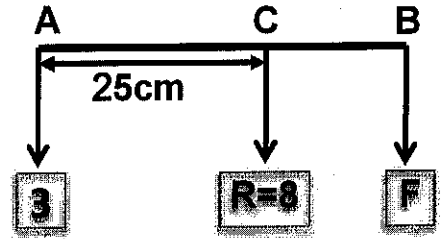
(11) If the two forces:  $\vec{F}_1 = 5\hat{i} - L\hat{j}$ ,  $\vec{F}_2 = \hat{i} + 3\hat{j}$  are parallel, then  $L = \dots\dots$

- (a) 5                      (b) 3                      (c) -15                      (d) -3

(12)

In the opposite figure:

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

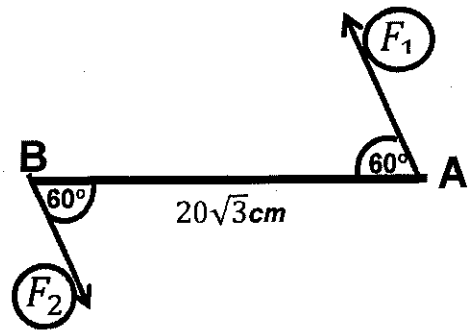


- (a) 15                      (b) 40                      (c) 45                      (d) 50

\*((بقية الأسئلة في الصفحة السابعة))\*



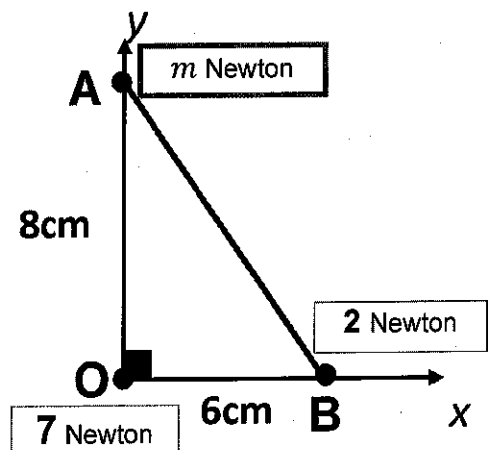
(13) In the opposite figure:  
 The two forces of magnitudes  $F_1, F_2$  form a couple and the algebraic measure of its moment  $210 \text{ Newton.cm}$ , then  $F_1 = \dots\dots\dots$  Newton



- (a) 21                      (b) 10                      (c) 7                      (d) 3

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

(14) 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  $\Delta ABO$  as in the figure where  $O$  is the origin, then  $m = \dots\dots N$



- (a) 3                      (b) 4                      (c) 5                      (d) 9

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

\*((بقية الأسئلة في الصفحة الثامنة))\*

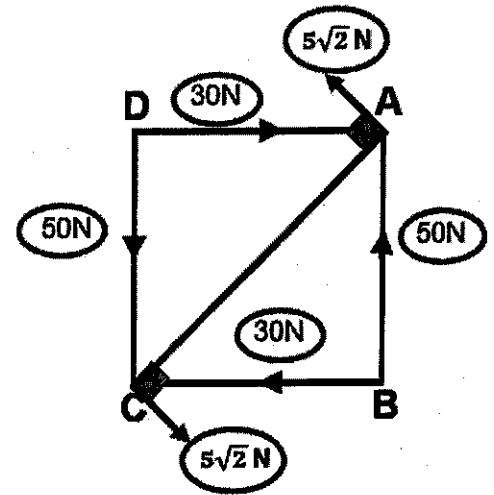
(15) In the opposite figure:

ABCD is a square of diagonal

Length  $4\sqrt{2}\text{cm}$ ,

The algebraic measure of

the resultant couple = .....N.cm



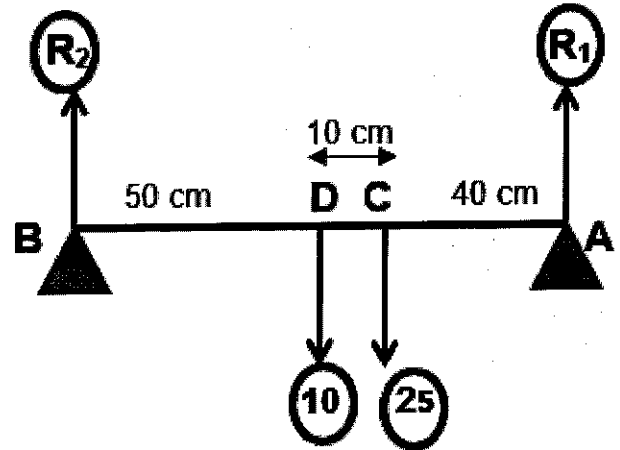
- (a) -200                      (b) 120  
(c) 80                         (d) -40

\*((بقية الأسئلة في الصفحة التاسعة))\*



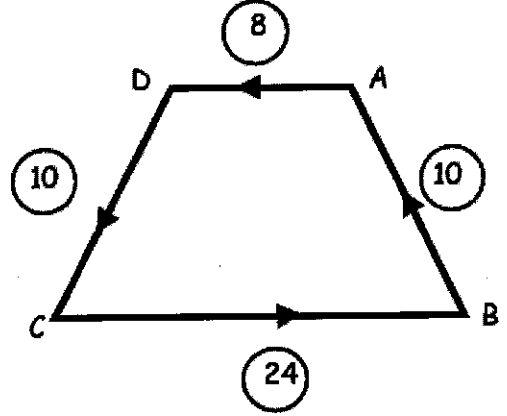
- (17) A body of weight 15 kg.wt is placed on an inclined rough plane which makes an angle with the horizontal line of tangent  $\frac{3}{4}$  , if the coefficient of the static friction between the body and the plane  $\frac{1}{3}$  , find the least force which acts in direction of the line of the greatest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

- (18)  $\overline{AB}$  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.



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

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

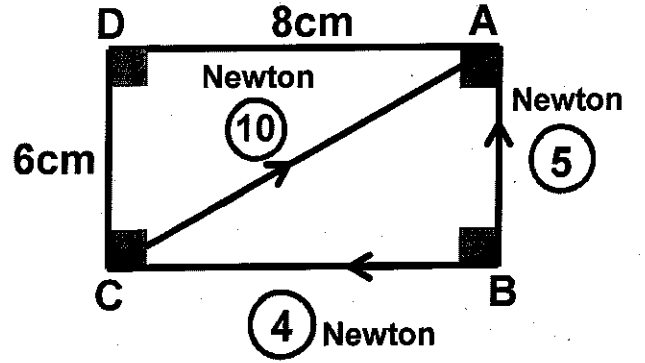


\*(( بقية الأسئلة في الصفحة الثالثة عشر ))\*

(20) In the opposite figure:

ABCD is a rectangle in which  
 $BC=8\text{cm}$ ,  $CD=6\text{cm}$ ,

Find Sum of the moments of  
 the forces about the point D.



(21) In the opposite figure:

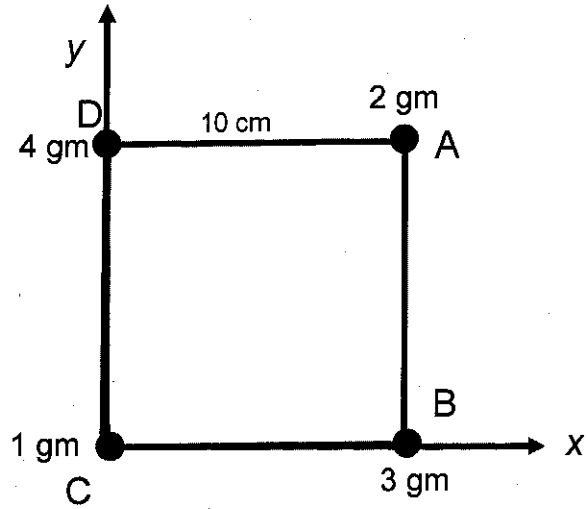
Find center of gravity

Of the set of given masses

Shown as in the given figure at the

Vertices of the square ABCD whose

Side length 10 cm.





\*\*\* مسودة \*\*\*

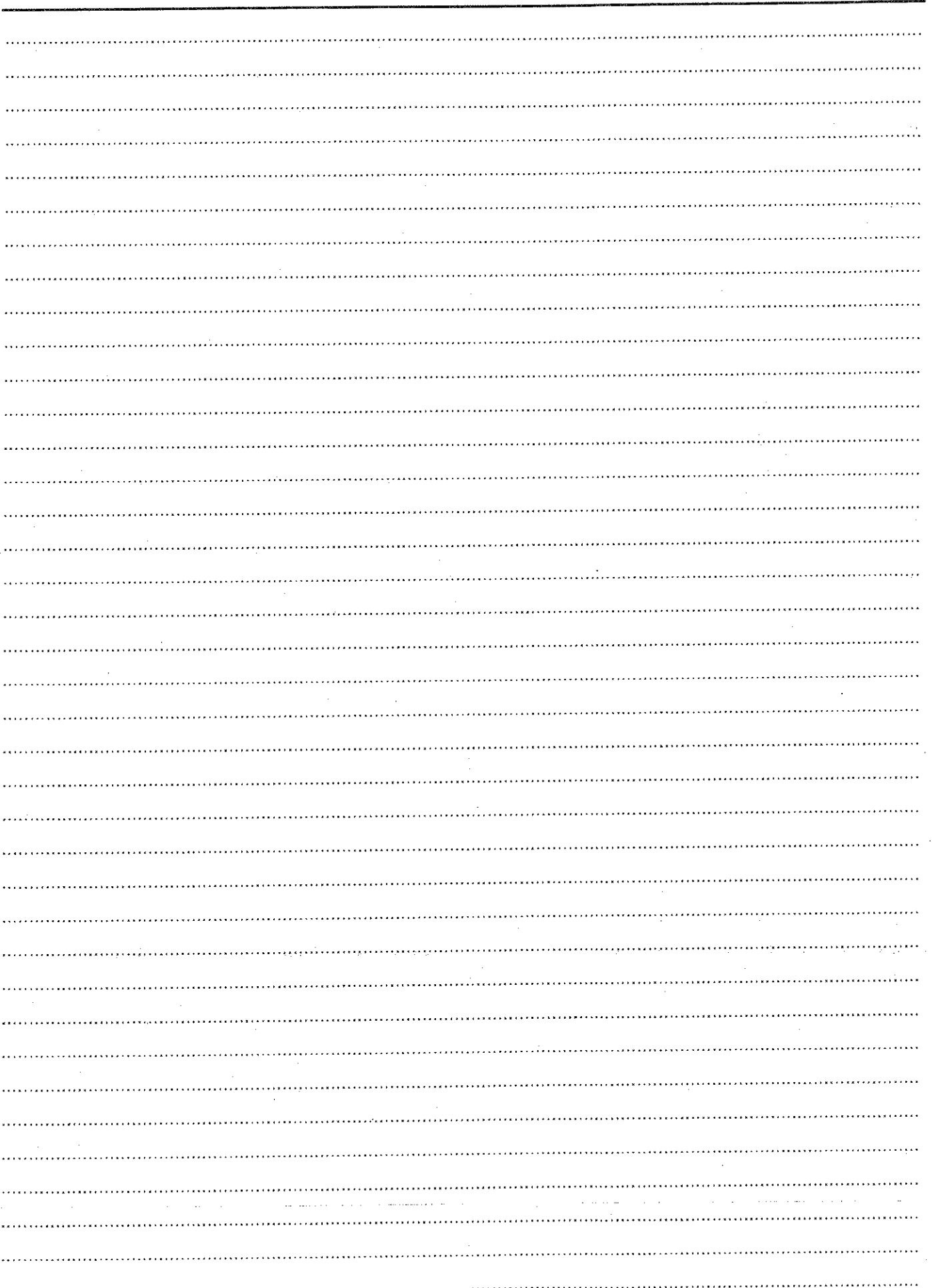
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\*\*\* مسودة \*\*\*

A series of horizontal dotted lines for writing, spanning the width of the page.

\*\*\* مسودة \*\*\*

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