

رقم المادة : ٢/ E٦٠١٢

دمج / ض . ب

عدد الصفحات (١٣ صفحة ) + الغلاف  
الخارجي + عدد (٤) صفحات مسودة وفقد أية  
ورقة من الكراسة يعتبر مسئولية الطالب.

جمهورية مصر العربية

وزارة التربية والتعليم والتعليم الفني

امتحان شهادة إتمام الدراسة الثانوية العامة لطلاب الدمج التعليمي

المادة : الرياضيات التطبيقية ( استاتيكا بالإنجليزية ) ( دمج ضعيف بصر )

زمن الإجابة : ساعتان ( الإجابة في نفس كراسة الأسئلة ) الدور الأول ٢٠٢٢ م

توقيع		الدرجة	السؤال
مراجع السؤال	مقدر السؤال		
			١
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			١٠
			المجموع

مجموع الدرجات

رقم المراقبة

مجموع الدرجات بالحروف :

امضاءات المراجعين :

جمهورية مصر العربية

وزارة التربية والتعليم والتعليم الفني

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الدور الأول ٢٠٢٢ م

( الإجابة في نفس كراسة الأسئلة )

رقم المراقبة

اسم الطالب رباعي /

الإدارة /

المدرسة /

المحافظة /

رقم الجلوس /

التوقيع

الإسم

١-

٢-

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

2022

مدير مصرح الطلاب بالكتابة في هذه الصفحة

2022

مدير مصرح الطلاب بالكتابة في هذه الصفحة

2022

(دمج . ض ب)

Arab Republic of Egypt  
Ministry of Education

أول / ٢ / E ( ٦٠١٢ )

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 ثلاثة 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  $AC = \underline{\hspace{2cm}}$  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  $L + m = \underline{\hspace{2cm}}$

(a) 2

(b) 8

(c) -2

(d) -8

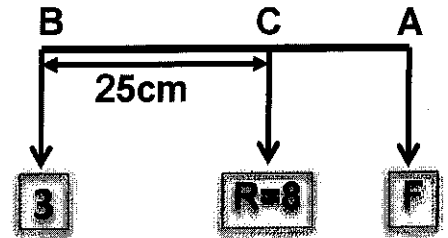
\*((بقية الأسئلة في الصفحة الثالثة))\*

(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) In the opposite figure:

Two parallel forces of magnitudes  
F, 3 Newton, if their resultant is of  
magnitude 8 Newton, then AC=\_\_\_cm



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

(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 where  $F_1 > F_2$  acting in opposite directions 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

- (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  $\vec{R}$  and if

$$x = a\sqrt{7} \text{ gm.wt.}, y = a\sqrt{2} \text{ gm.wt.}, R = 21 \text{ gm.wt.},$$

then the value of  $a = \text{-----}$ , (where  $a > 0$ )

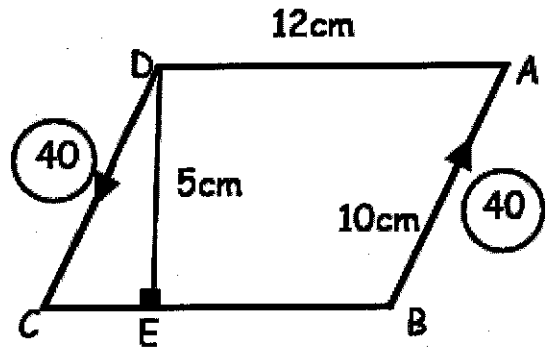
- (a) 3                      (b) 7                      (c) 9                      (d) 21

(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 force  $\vec{F} = \hat{i} + 2\hat{j}$ , its moment about the origin  $= 6\hat{k}$ , then the moment of the force  $\vec{F}$  about the point B(-1,3) equals \_\_\_\_\_

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

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

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

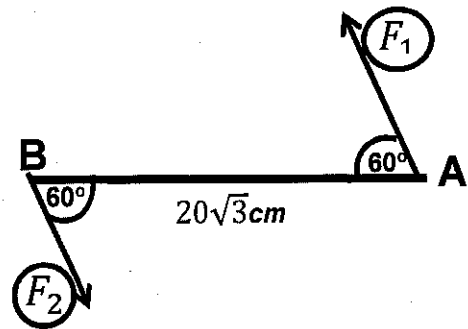


(13)  $\overline{AB}$  is a uniform ladder of weight 15 kg.wt. rests with its end A on a rough horizontal ground , with its end B on a smooth vertical wall , if the reaction of the vertical wall on the ladder  $5\sqrt{3}$  kg.wt , the ladder is about to slide, then the coefficient of the static friction between the ladder and the ground = \_\_\_\_\_

- (a)  $\frac{\sqrt{3}}{3}$       (b)  $\frac{\sqrt{3}}{2}$       (c)  $\sqrt{3}$       (d)  $\frac{1}{2}$

(14) 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

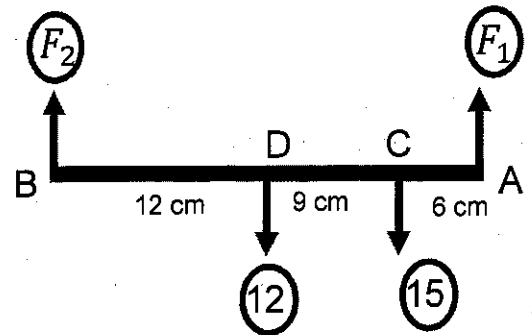


- (a) 21      (b) 10      (c) 7      (d) 3

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

- (a)  $19\hat{i} - 7\hat{j} - 11\hat{k}$       (b)  $-19\hat{i} - 7\hat{j} + 11\hat{k}$   
 (c)  $-19\hat{i} - 7\hat{j} - 11\hat{k}$       (d)  $-\hat{i} - 7\hat{j} - \hat{k}$

(16) In the opposite figure:  
 forces of magnitudes:  
 $F_1, F_2, 15, 12$  Newton act at the points  
 A , B , C , D respectively, if the set of  
 Forces are in equilibrium, then:  
 $F_2 =$  \_\_\_\_\_ Newton



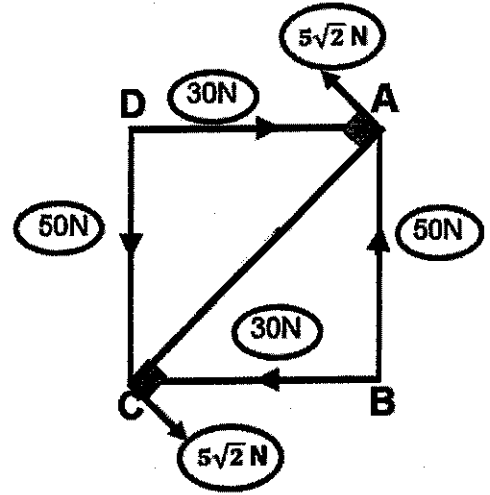
- (a) 10      (b) 20      (c) 30      (d) 40

(17) In the opposite figure:

ABCD is a square of diagonal

Length  $4\sqrt{2}$ cm,

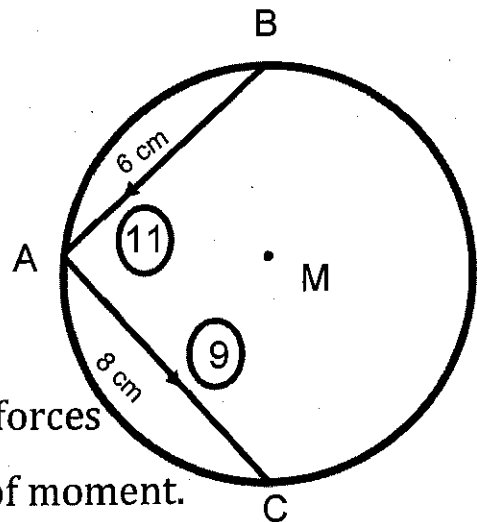
The algebraic measure of  
the resultant couple = \_\_\_N.cm



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

(18) In the opposite figure:

A circle of center M in which  
its radius = 5 cm , AB = 6 cm,  
AC = 8 cm, if forces act in directions  
as in the figure, then the sum of  
algebraic Measure of moments of these forces  
about the center M equals \_\_\_\_\_ unit of moment.



- (a) 17                      (b) 71                      (c) 72                      (d) 73

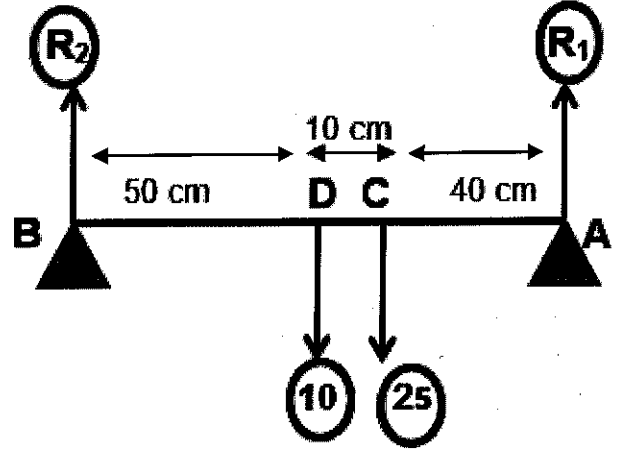
**Secondly: Answer the following questions:**

(19) 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.

(20) In the opposite figure:

$\overline{AB}$  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.



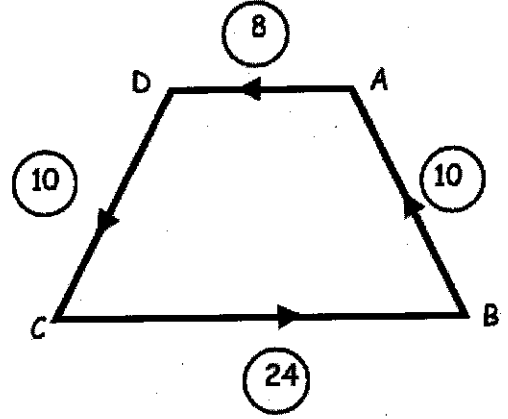
(21) In the opposite figure:

$ABCD$  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.



(22) In the opposite figure:

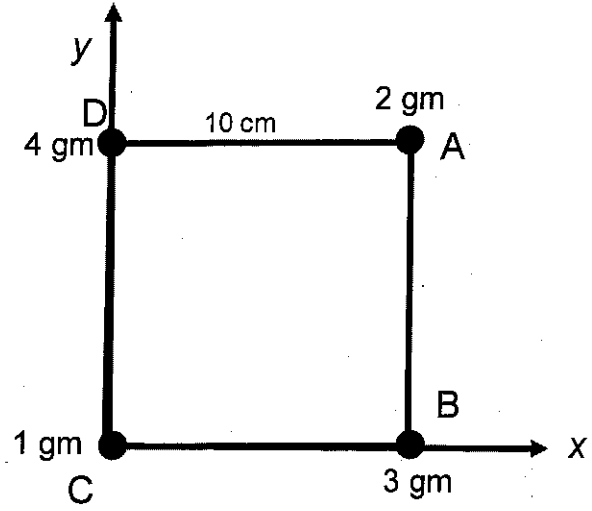
Find center of gravity

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 \*\*\*



\*\*\* مسودة \*\*\*

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**2022**