

دمج / س

جمهورية مصر العربية

وزارة التربية والتعليم والتعليم الفني

امتحان شهادة إتمام الدراسة الثانوية العامة لطلاب الدمج التعليمي

المادة : الرياضيات التطبيقية ( ديناميكا بالإنجليزية ) ( دمج سمعي )

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

السؤال	الدرجة	توقيع	
		مقدر السؤال	مراجع السؤال
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المجموع			

مجموع الدرجات

رقم المراقبة

مجموع الدرجات بالحروف :

إمضاءات المراجعين :

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الدور الأول ٢٠٢٢ م

( الإجابة فى نفس كراسة الأسئلة )

رقم المراقبة

اسم الطالب رباعيا /

المدرس / الإدارة /

رقم الجلوس / المحافظة /

التوقيع

الإسم

-١

-٢

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

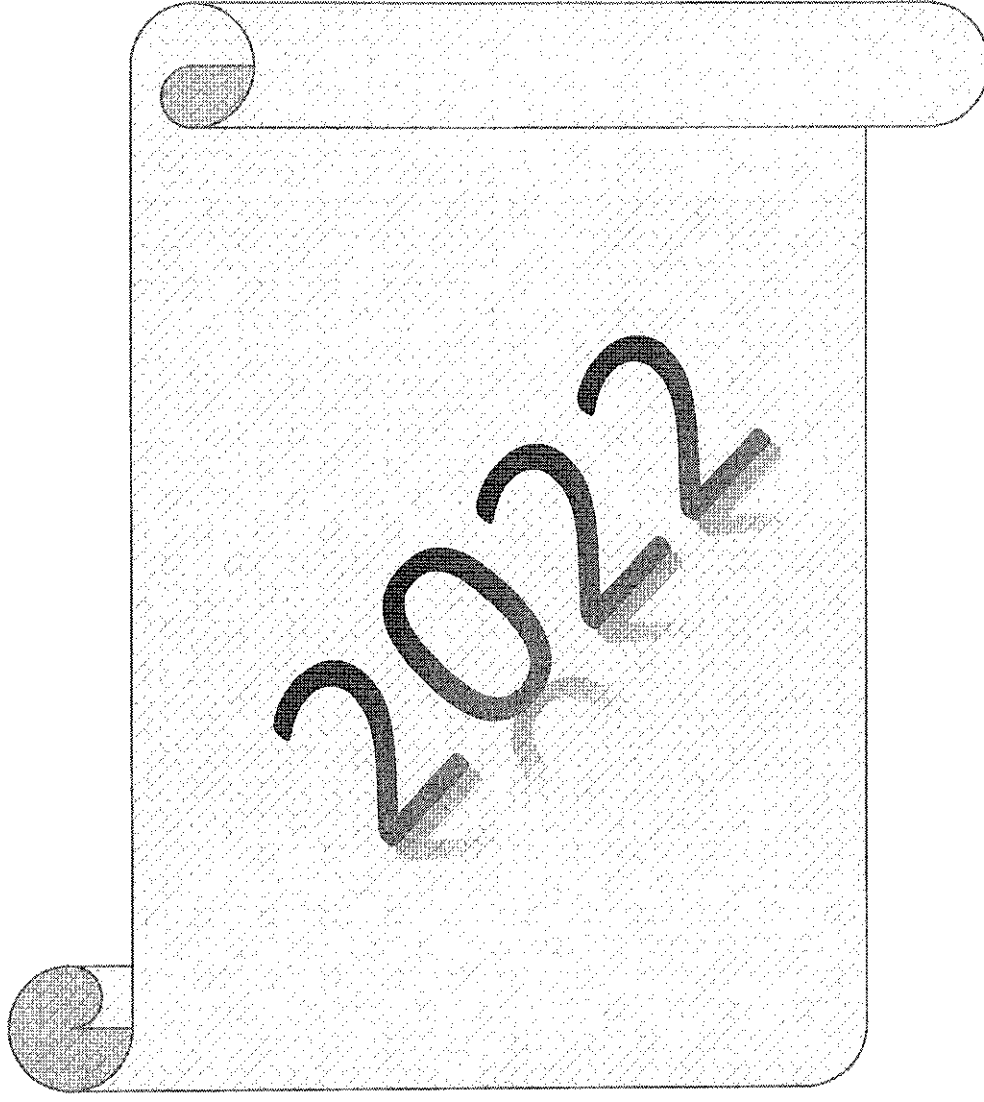
2022

غير مصرح للطلاب بالكتابة في هذه الصفحة

2022

غير مصرح للطلاب بالكتابة في هذه الصفحة

2022



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

dynamics

Time: 2 Hours

(الإجابة في نفس كراسة الأسئلة)

الديناميكا (بالإنجليزية) الدور الأول ٢٠٢٢

(الأسئلة في أربعة عشر صفحة)

يسمح باستخدام الآلة الحاسبة

Calculator is allowedFirst: Choose the correct answer from those given

(1) If the velocity of a particle is determined by the relation  $v = x^2 - 3$ , where  $\|\vec{v}\|$  is in (m/sec),  $\|\vec{x}\|$  is in meter, then when  $x=2m$ . the acceleration of this particle  $a = \dots\dots\dots m/s^2$

(a) 4

(b) 3

(c) 1

(d) zero

(2) If a body of mass 17 kg. moves under the action of the force  $\vec{F} = 8\vec{i} + 15\vec{j}$ , where  $\|\vec{F}\|$  is in Newton, then the magnitude of the acceleration equals.....m/s<sup>2</sup>

(a)

zero

(b)

1

(c)

2

(d)

3

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

- (3) If a force of magnitude 170 Newton acts on a body of mass 5 kg, in the same direction of its motion for  $\frac{1}{17}$  sec to change its velocity from:  $v_1 = 15$  m/sec to  $v_2$ , then  $v_2 = \dots\dots\dots$  m/sec

- (a) 13      (b) 17      (c) 15      (d) 25

- (4) If a body moves on a straight line under the effect of the force  $\vec{F} = 6\vec{i} - 3\vec{j}$  from the point A(-1,2) to the point B(3,4), where  $\vec{i}$ ,  $\vec{j}$  are orthogonal unit vectors, then the work done by this force =  $\dots\dots\dots$  work unit

- (a) 18      (b) 12      (c) 6      (d) 3

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

(5) A particle moves in a straight line, from rest from a fixed point its algebraic measure of its velocity after time  $t$  second is given by the relation  $v = (1 - \cos t)$  , then the algebraic measure of its displacement vector  $\vec{s} = \dots\dots\dots$

- (a)  $t - \cos t$  (b)  $t + \cos t$   
 (c)  $t - \sin t$  (d)  $t + \sin t$

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(6) If a constant force acts on a body at rest, the magnitude of its impulse on it is equal to  $35.28 \text{ N} \cdot \text{s}$  during  $\frac{1}{25}$  second , then the magnitude of this force = .....

- (a) 90 Newton (b) 882 gm.wt (c) 882 Kg.wt (d) 882 Newton

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(7) A body is suspended to a spring scale fixed in the ceiling of a lift, the scale reading was **18** kg.wt when the lift was ascending with uniform acceleration  $a$  m/s<sup>2</sup> and the scale reading was **15** kg.wt when the lift was descending with uniform acceleration  $2a$  m/s<sup>2</sup>, then the mass of the body = ..... kg

(a) 17

(b) 15

(c) 18

(d) 33

(8) If the two Forces  $\vec{F}_1 = \vec{i} + 5\vec{j} + 7\vec{k}$ ,  $\vec{F}_2 = 2\vec{i} - \vec{j} - 2\vec{k}$ , act on a body for two seconds, then the magnitude of the impulse of the resultant of the two forces on this body = ..... impulse unit.

(a)  $5\sqrt{2}$ (b)  $10\sqrt{2}$ (c)  $15\sqrt{2}$ (d)  $100\sqrt{2}$

(9) If a body of mass 1 kg. fall down from a height 20 m. above the ground surface, then the **sum** of its kinetic and potential energy after 1 second from the instant of falling = .....joule.

- (a) 196      (b) 98      (c) 49      (d) 20

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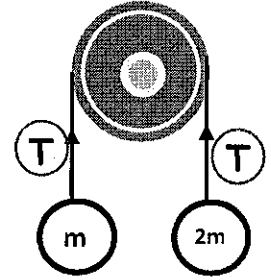
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(10) In the opposite figure:

The small pulley is smooth, the system moves from rest, if the magnitude of the tension in the string = 30 N, then the pressure on the pulley = .....N



- (a) 30      (b)  $30\sqrt{2}$       (c) 15      (d) 60

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(11) A smooth ball of mass 400 gm moves with velocity 24 cm/sec , collides with another smooth ball of mass 200 gm at rest , if the velocity of the first ball after the collision changed to 16 cm/sec in its previous direction, then the velocity of the second ball after collision = ..... cm/sec

- (a) zero      (b) 8      (c) 16      (d) 24

(12) An airplane moves horizontally under the effect of resistance directly proportional as the square of its velocity, if the resistance equal 324 kg.wt, when its velocity 75 m/sec and its maximum velocity equal 125m/sec, then the engine power of the airplane = ..... horse.

- (a) 1250      (b) 1500      (c) 1750      (d) 2000

(13) A body of mass 200 gm moved from rest from the top of an inclined smooth plane of length 25 m , inclined to the horizontal by angle of sine 0.1 , then the kinetic energy of the body when it reached the bottom of the plane =..... joule

- (a) 4.9      (b) 9.8      (c) 490      (d) 980

(14) A rigid body is projected vertically upwards and its height  $x$  meter after  $t$  second from its projection is given by the relation  $x = 39.2t - 4.9t^2$  , then the maximum height of the body = .....meter.

- (a) 4.9      (b) 9.8      (c) 58.4      (d) 78.4

(15) A body of mass 100 kg moved upwards a smooth inclined plane, inclined to the horizontal by angle of measure  $30^\circ$ , with acceleration  $3 \text{ m/s}^2$  under the effect of a force  $\vec{F}$  acts along of the line of the greatest slope upwards, then the magnitude of the force  $\vec{F} = \dots\dots\dots$  Newton

- (a) 790      (b) 300      (c) 190      (d) 490

(16) A ball started motion on a rough horizontal ground with initial velocity 28 m/sec and stopped after 10 second, then the kinetic coefficient of friction between the ball and the ground equals .....

- (a)  $\frac{1}{10}$       (b)  $\frac{2}{7}$       (c)  $\frac{5}{18}$       (d) 1

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

(17) If a body moves under the effect of the force  $\vec{F} = 2\vec{i} + \vec{j}$ , its displacement vector  $\vec{s}$  as a function of time is given by the relation  $\vec{s} = t^2\vec{i} + 5t\vec{j}$ , where  $\vec{i}$ ,  $\vec{j}$  are two orthogonal unit vectors, where  $\|\vec{F}\|$  is in Newton,  $\|\vec{s}\|$  is in meter,  $t$  is in second, then when  $t = 4$  sec the power equals.....

- (a) 2 watt      (b) 21 watt      (c) 5 watt      (d) 28 watt

(18) The Kinetic energy of a projectile of mass 1 kg moves with velocity 30 m/sec equals..... Joule

- (a) 3000      (b) 2000      (c) 1450      (d) 450

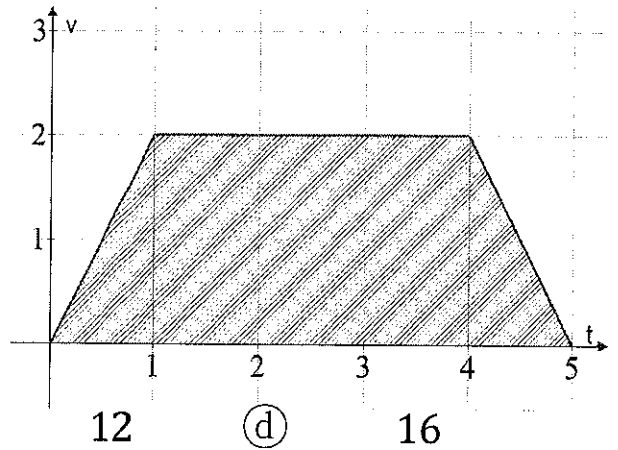
(19) A particle moves in a straight line from rest from the origin point, its acceleration after time t second is given by the relation

$(4t + 3) \text{ m/s}^2$  , then its velocity of the particle after 1 second equals .....  $\text{m/s}$

- (a) 4
- (b) 5
- (c) 6
- (d) 7

(20) The opposite figure:

Represents Velocity-time graph, then the magnitude of the displacement equals ..... Length unit



- (a) 8
- (b) 14
- (c) 12
- (d) 16

**Second: Answer the following questions: -**

(21) A sphere of mass 300 gm falls from a height 3.6 meters on a viscous liquid surface and penetrates it with a uniform velocity , to travels for a distance of 9.6m in 2 seconds. Calculate magnitude of the impulse of the liquid on the sphere.

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

(22) A body of mass 63 kg. is placed inside a box of mass 35 kg which is tied with a rope that move the box vertically, if the magnitude of the tension in the string 105 kg.wt., then find magnitude and direction of the acceleration of the box.

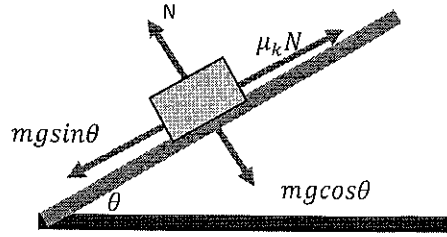
\*((بقية الأسئلة في الصفحة الثالثة عشر))\*

(23) A car of mass 3 tons and the power of its engine is 90 horses moves on a horizontal road with maximum velocity 50 m/sec . Find the magnitude of the road resistance to its motion per each ton of its mass .

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



- (24) A body descends from rest from the top an inclined rough plane of length 4.5 m and height 2.7m, if the coefficient of the kinetic friction equals  $\frac{1}{2}$ , find the velocity of the body when it reaches the plane base.



\*((( انتهت الأسئلة )))\*

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