Physics
Sec 1

Final revision

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Questions

1- Cm=…………micrometer

   a) 10^2 b) 10^4 c) 10^6 d) 10^8

2- 5Gs = …………… ms

   a) 5×10^{-9} b) 5×10^{12} c) 5×10^{-15} d) 10^{15}

3- 0.1 mg = ... kg

   a) 10^{-7} b) 10^{-5} c) 10^{-8} d) 10^{-4}

4- 9 ms = ... ns

   a) 9×10^6 b) 9×10^{-5} c) 9×10^{-4} d) 9×10^{-7}

5- The dimensional of medal were measured as 23 mm 4.23 mm and 12.7mm which of the following tools was used in measuring process is………

  a) Ruler   b) standard meter   c) meter tap   d) vernier caliper

6- Sarah likes to measure the diameter of an electric wire to an accuracy that reaches 0.01mm. What tool would she use?

   a) The ruler   b) The micrometer   c) The Vernier callipers   d) The protractor

7- From the opposite figure: the measuring of the angle (x) in the international system of units is…………

   a) Candela   b) radian   c) Steradian   d) meter
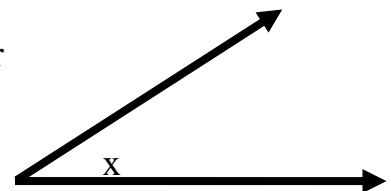
8- Assume that the displacement (d) of a body is related with time (t) as in the given relation: d=ct2 then the dimensional formula of (c) is ………

   a) L   b) LT^2 c) LT^{-2} d) L^2T

9- If the two physical quantities A and B have different dimensions, which of the following mathematical operations has a physical meaning?

a) $A + B$ b) $A - B$ c) $A - (A/B)$ d) AB

10- A metallic ball of radius r is dropped into tank of water, if its velocity in water was v and it is affected by a resistance force given by the relation $F = Krv$ where k is a constant, then the measuring unit of K is equal to……………

a) $Kg\ m^2\ s^{-1}$ b) $kg\ m^{-2}\ s^{-2}$ c) $kg\ m^{-1}\ s^{-1}$ d) $kg\ m\ s^{-2}$

11- A body moves in a straight line where its displacement (x) changes with time (t) according to this relation: $x = Bt + Ct^2$, then……………

	The dimensional formula of B	The dimensional formula of C
A	L	L^2
B	L	T^2
C	$L\ T^{-1}$	L^2
D	$L\ T^{-1}$	$L\ T^{-2}$

12- If the power = force x speed   so the dimensional formula of power is …………

a- ML^2T^2 b- ML^2T^{-2} c- ML^2T^{-3} d- ML^2T^3

13- The most accurate measurement of the time of motion of a body from the following measurements is……….

a) (3 ± 0.5) ms   b) (3.2 ± 0.5) ms   c) (2.5 ± 0.025) ms   d) (2.5 ± 0.25) ms

14- When the density of a liquid is measured by a hydrometer, it is found to be (1000 ± 1) kg/m^3 so………..

	The type of measurement	The percentage of error in measurement
A	Direct	0.1 %
B	Direct	1 %
C	Indirect	0.1 %
D	Indirect	1 %

15- If the height of a student is (1.8 ± 0.05) m and the height of another student is (1.95 ± 0.05) m, so the second student is longer than the first student by …………. m

a) (3.75 ± 0.05) b) (3.75 ± 0.1) c) (0.15 ± 0.1) d) (0.15 ± 0.05)

16- A group of students measure the velocity of a moving body, which of these measurements is more accurate?

    a) (350 ± 20) m/s   b) (340 ± 15) m/s   c) (335 ± 10) m/s   d) (320 ± 10) m/s

17- If the dimensional formula of the physical quantity (A) is $M^2\,LT^{-2}$ and the dimensional formula of the physical quantity (B) is $M^2\,LT^{-2}$ so the dimensional formula of (4A-2B) is…

    a) $M^4\,L^2\,T^{-2}$ b) $M^2\,LT^{-2}$ c) $M^{-4}\,L^{-2}\,T^4$ d) has no physical meaning

18- If the dimensional formula of the quantity (x) is LT^{-1} and the dimensional formula of the quantity (y) is $ML^{-1,}$ so the dimensional formula of the quantity (z) which verifies the equation: $x = \sqrt{\dfrac{z}{y}}$ is……………

    a) MLT^{-1} b) MLT^{-2} c) $ML^2\,T$ d) MLT

19- If A=(2 ± 0.01)m and B=(80 ± 2) cm, then the value of (A+B)equals…….

    a) (80.2 ± 2.01) m   c) (82 ± 2.01) m

    b) (2.8 ± 2.01) m   d) (2.8 ± 0.03) m

Essay questions

1- When the speed and the time of motion of a car are measured, they are found to be (25 ± 0.5) m/s and (1 ± 0.01) s. calculate the distance covered by the car during this interval

2- When the density of a cube was calculated, the percentage of error in measuring its mass was 2 % and the percentage of error in measuring its side length was 0.5 %. Calculate the percentage of error in calculating its density (knowing that density = mass/volume)

3- An object starts its motion from rest in a straight line with uniform acceleration (a) and it makes a displacement (d) in time (t). if d=(200 ± 0.5) m and t=(20 ± 0.5), calculate the acceleration of the object
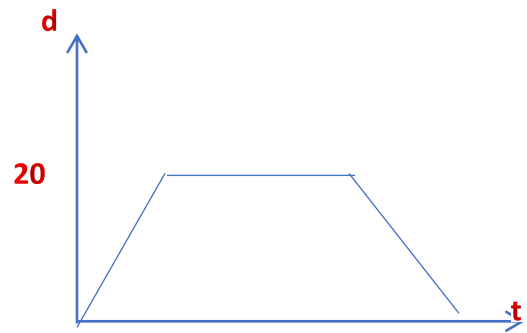
4- If X = (5±0.1) cm and Y= (7±0.2) cm, calculate Y-X

5- By using the dimensional formula of physical quantities, check the validity of the following relation: $F=ma^2$ (knowing that the $F=MLT^{-2}$)

Ch2 unit one
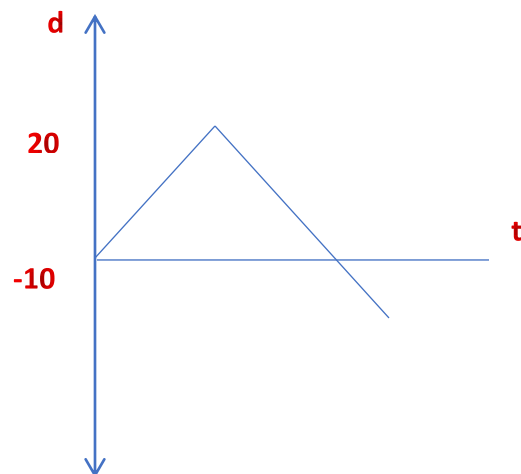
1- From the following graph

  displacement = 0…………

  Distance   = 40

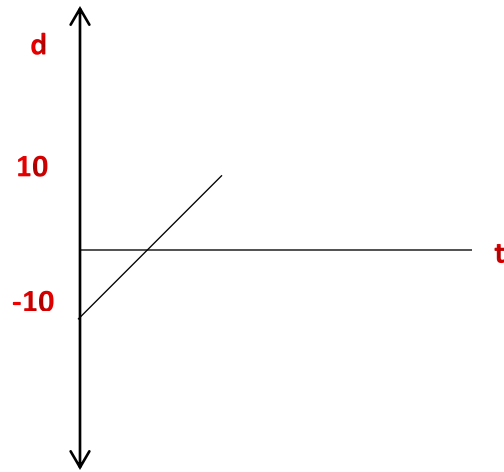**2- From the following graph**

  Distance = …50………….

  Displacement = ……-10…
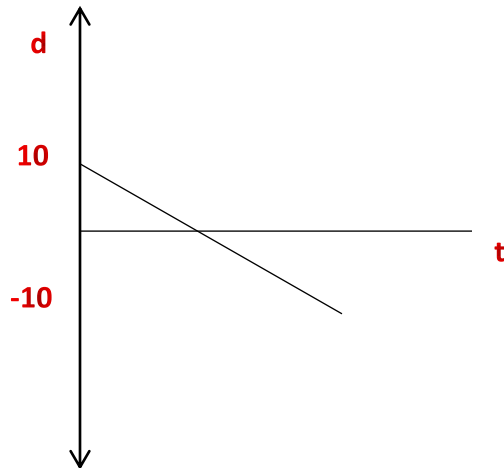
3- From the following graph

Distance = ……20……….

Displacement = …20……

4- From the following graph

Distance = ………20…….

Displacement = ……-20…

5- An object moves along the circumference of a circle of a radius π, if the object covered $\frac{3}{4}$ revolution, then the displacement will be……..

a) $2\sqrt{\pi}$ b) $\sqrt{2\pi}$ c) $\pi\sqrt{2}$ d) 0.75 π

6- An body moves along the circumference of a circle of a radius r, if the body complete 2 complete revolutions, then the displacement will be……..

a) Zero   b) r   c) 2 r   d) 2 πr

7- The magnitude of the displacement of a body moving along the circumference of a circle when it complete $\frac{1}{4}$ of a revolution is ………the magnitude of its displacement when it completes $\frac{3}{4}$ revolution

a) half   b) 3 times   c) equal to   d) one third of

8- A body moves along circumference of magnitude r. if it completes two revolutions, so the magnitude of its displacement is equal to…………
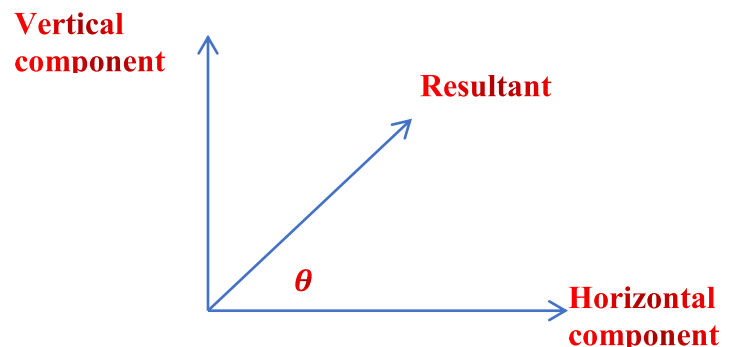
a) **0** b) r c) 2r d) 7 r

9- an object moves along the circumference of a circle of a radius r. the ratio between the distance covered by it and its displacement during $\frac{1}{2}$ of a revolution is…………………..

a) π b) 2π c) $\frac{\pi}{2}$ d) $\frac{\pi}{4}$

10- The diagram shows a resultant force and its horizontal and vertical components. The horizontal component is 20 N and θ =30°, what is the vertical component?...............

a) 8.7 N c) 10 N
b) **11.5 N** d) 17.3 N

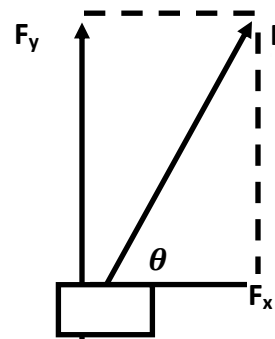**11-** Two forces, each of 10 N, act at a point P as shown in the diagram. The angle between the directions of the forces is 120°. What is the magnitude of the resultant force?

a) 5 N c) **10 N**
b) 17 N d) 20 N
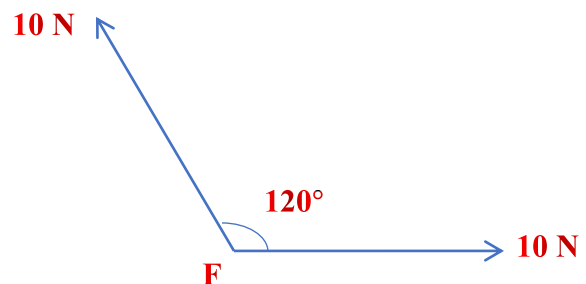
12- In the opposite figure if Fy= 2Fx, then the value of θ is……….
a) 60° b) 37.67 ° c) 45° d) **63.43°**

13- The angle between vector Y and vector X is equal to 90. Which of the following operations equal zero?

a) X + Y   b) X − Y   c) X x Y   **d) X.Y**

14- If the magnitudes of the two vectors A and B are A = 10 units and B = 20 units and the angle between them is 60, then the scalar product of the two vectors equals

a) 200   **b) 100**   c) 70   d) 50

15- There two vectors A and B, where A = 8 cm and B =2 cm and the angle (θ) between 30 then the magnitude of their vector product equals

a) $5\sqrt[2]{3}$ b) 5   c) $8\sqrt[2]{3}$ **d) 8**

16- scalar product of the two vectors $\vec{A}$ and $\vec{B}$ equals 60 units and the magnitude of their vector product equals $20\sqrt{3}$ units , thus the confined angle between the two vectors equals ....
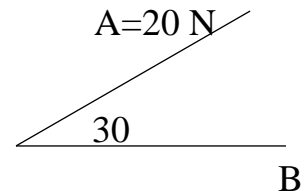
a) 15°   **b) 30°**   c) 45°   d) 75°

17- The scalar product of two vectors and the magnitude of their vector product equalize when the angle between the two vectors is…………..

a) 75   b) 60   **c) 45**   d) 30

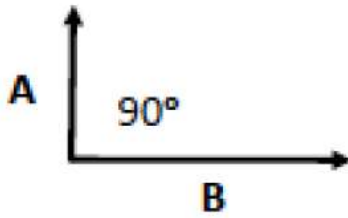18- From the opposite figure. If the vector product = 60 N and A = 20N so magnitude of B **is** ....

a) 600N   **b) 0.66 N**   **c) 6 N**   **d) 0.16 N**

A=20 N

30

B

7

ESSAY

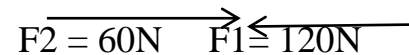1- The figure shows two vectors where the magnitude of A = 3, and the magnitude of B = 4
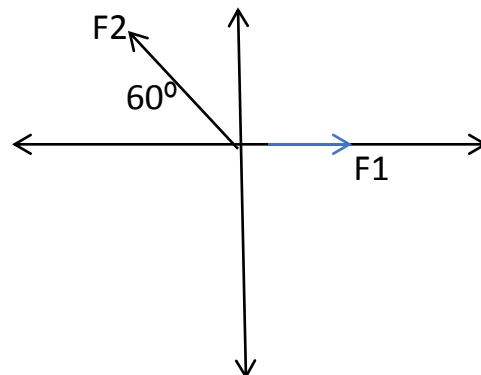

Calculate

a) their vector product , and its direction
b) scalar product

2- use the opposite diagram to find the dot product and the cross product

Of the two forces F1 and F2

$$\overline{F2} = 60N \quad \overrightarrow{F1} \underline{\leq 120N}$$

3- in the opposite diagram two forces F1 of magnitude 6N and F2 of magnitude

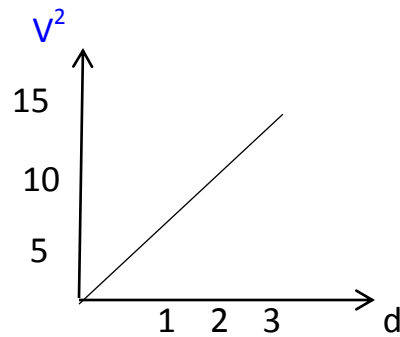9N act at a certain point. find the dot product and cross product of the two forces

Choose

1- An object moves according to the relation: $2v_f = \sqrt{36 + 16d}$ where (v) is velocity and (d) is displacement in meter. Find:
   a) The initial velocity of the object.
   b) The acceleration of its motion.
   c- distance after 4 s

2- An object moves according to the relation: $vf = \sqrt{2d + 25}$ where (v) is velocity and (d) is displacement in meter. Find:
   a) distance after 4 s

3- Mohamed drove a car at uniform velocity (30 m/s). Suddenly, he saw a child crossing the street and he applied the brakes to decelerate the car uniformly at (9 m/s2). If Mohamed's reaction time to use the brakes is (0.5s), find the displacement of the car till it stopped.

4- A body was moving at uniform velocity 4m/s for 8 sec and then at acceleration 4m/s^2 for 6 s Calculate the total distance

5- Car moves with velocity 30 m/s and after 5s its velocity becomes 10m/s calculate the distance covered by the car in the third second.

6- A body is moving according to this relation: $t \sqrt{\dfrac{2d}{3}}$, so the velocity after 4 s is

   $\dfrac{2}{3}$ s   b) 3 s   c) 4m/s   d) 12m/s

7- A train of length 100 m enters a straight tunnel of length 1 km with a velocity of 4 m/s. If the train is moving by acceleration 0.5 m/s, then the required time for the entire train to leave the tunnel is .....

   A) 550 s   b) 58.81 s   c) 20.31 s   d) 20 s

9

8- The opposite graph describes the motion

   of a body moving by a uniform acceleration,

   so the acceleration of this body equals

   a) 8 m/s^2 b) 4 m/s^2 c) 2.5 m/s^2 d) I m/s^2

(graph: V^2 axis vertical with values 5, 10, 15; horizontal axis d with values 1, 2, 3)

9- A stone falling down from height 90m if g $= 10$ m/s^2 find its final velocity and the height.

10- An object falls from 5 m high above the ground. Find its velocity when reaching the ground and the time taken. (g $= 10$ m/s^2)

11- An object is projected at an angle of 30 to the horizontal and returns to the earth's surface after 4 s, then the initial velocity by which the object is projected equals……… m/s

   a) 60   b) 40   c) 35   d) 20

12- A ball is projected from the earth's surface with velocity of 20 m/s at an angle of 60 to the horizontal then the maximum height reached by the ball is…… m

   a) 0.866   b) 5   c) 15   d) 30

13- If an object is projected upwards at an angle of 30 to the horizontal and its initial velocity is 20 m/s, so the maximum height reached by the object is………….m

   a) 5   b) 10   c) 15   d) 20

14- If the body projected by velocity make angle θ with horizontal, if $V_{iy} = 4V_{ix}$
      So the angle between them is ……………..
   a) 30   b) 45   c) 76   d) 63.4

10

15- When an object is projected at initial velocity in a direction making an angle 60° to the horizontal to reach a horizontal range R. To make the projectile reach a greater range, it should be projected at the same initial velocity and angle ....

    a) a) 90°   b) 75°   c) °45   d) 30°

16- A body projected by initial velocity Vi make angle 45 ° with horizontal to cover horizontal range 100m , if the body projected by same initial velocity , it will projected By angle 60 the horizontal range may be ……………m

    a) 100   b) 150   c) 70   d) 120

17- The horizontal displacement reached by two identical projectiles in the same when they are projected at the same initial velocity from the same point at angles…………

    a) 80 and 10   b) 30 and 50   c) 80 and 20   d) 80 and 30

18- A body projected by initial velocity Vi make angle 40 ° with horizontal to cover horizontal range 100 m, to cover same range by same initial velocity, it will projected. By angle …………….

    b) 30   b) 50   c) 70   d) 10

19- A body projected by initial velocity Vi make angle 45 ° with horizontal to cover horizontal range 100m and maximum height 25m , if the body is projected by angle 60° so the horizontal range is ……………………and maximum height ………………………

    a) increase – decrease
    b) increase – increase
    c) decrease – increase
    d) decrease – decrease

20- which graph has large acceleration 1 or 2?
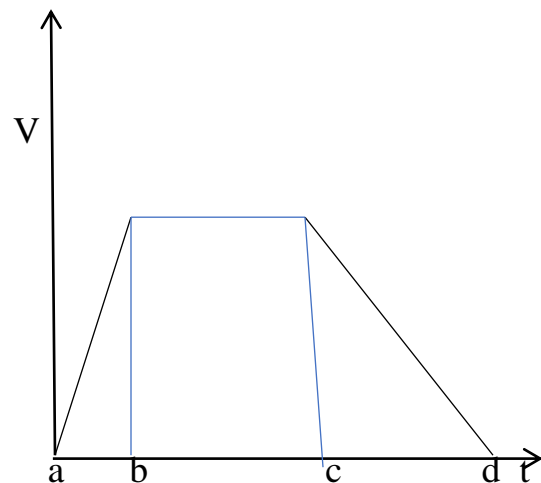   **And why?**
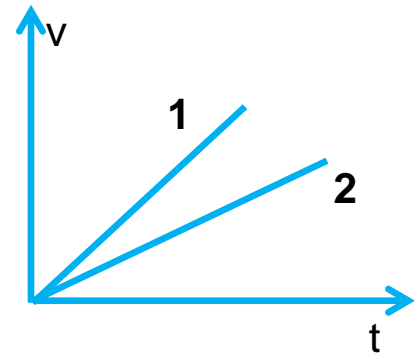
21- from the following graph find ratio between acceleration of A and B?
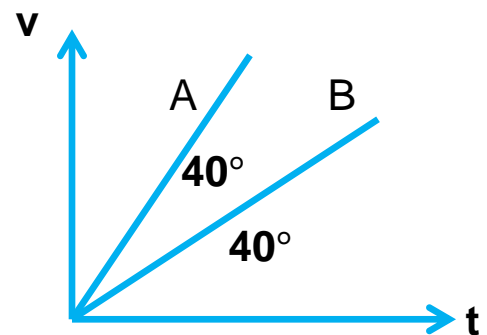
23- Choose

1) the opposite graph represents the relation

between the displacement (d) and the time (t)

for a car that moves in straight line so in which

 period the acceleration of the car greatest

a) period ab

b) period bc

d) period cd

24- Two boxes are dropped from a static balloon, the first one is dropped when the distance between the balloon and the earth's surface was (H) and the second one when the distance was (4H), calculate the ratio between the time taken by the box to reach the earth's surface in the second case and the time taken by it in the first case

25- The places of two X and Y cars have been represented at successive intervals of 1 second in numbered shapes in the bottom shape. As thought the direction of movement of the two cars to the right.
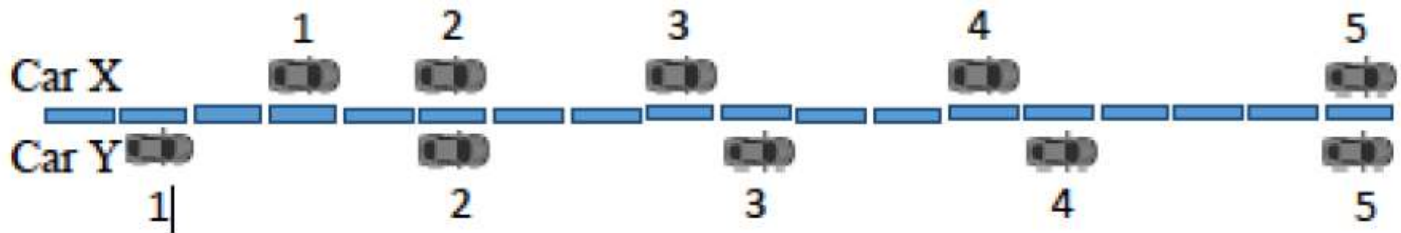

Which of the following phrases correctly describes the movement of the two cars?

A. The two vehicles move at an irregular speed.

B. The car moves X at regular speeds, while the Y-car moves in a regular acceleration

C. The X-car moves with an irregular acceleration , while the Y-car moves at regular speeds.

D. The X-car moves in a regular acceleration , while the Y-car moves at regular speeds.

26- Study the following graphs then answer:
The body that represents the motion with a uniform velocity is.........

a) D   b) C   c) B   d) A

Body A   Body B   Body C   Body D

13
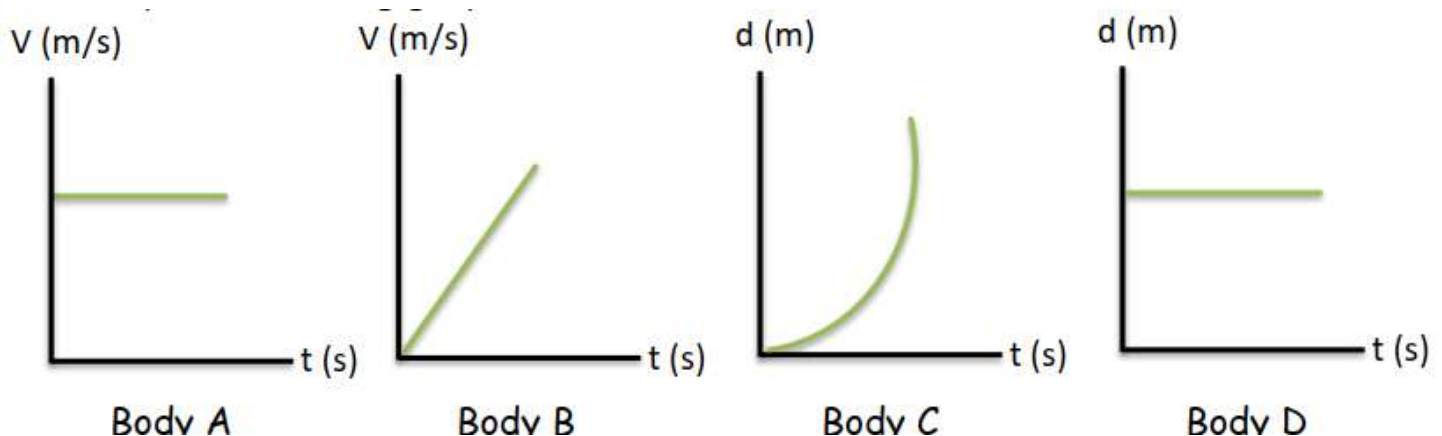
27- The opposite graph represents the relation between
the velocity (v) and time (t) for a moving body, which   V (m/s)
2 choices describe the motion of the body?
a) The speed changes with non-uniform rate
b) It moves equal displacements in equal time intervals
c) It moves with uniform acceleration
d) Its velocity changes by uniform rate
e) It moves with uniform velocity
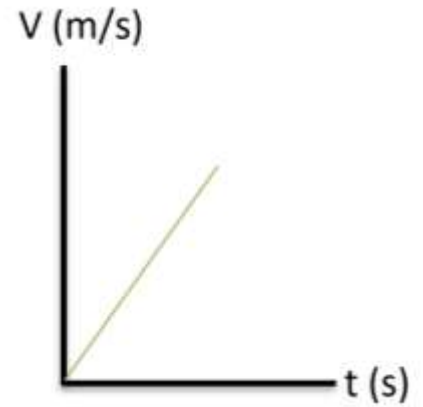
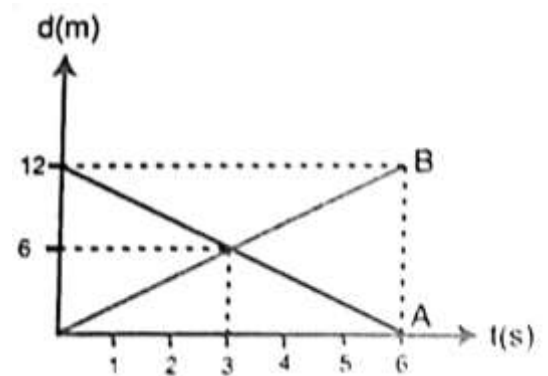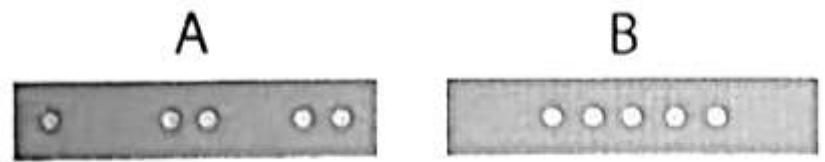28- In the opposite graph, the acceleration of the object is equal to……. m/s^2
a) -2
b) 2
c) 4
d) -4
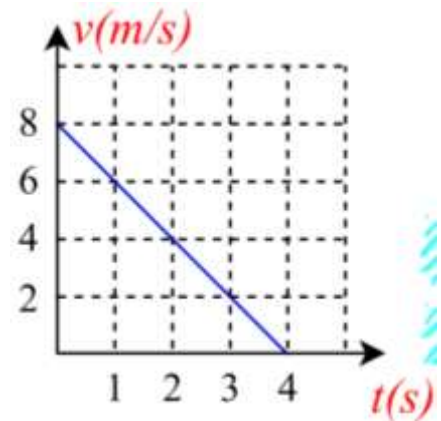
29- The opposite graph represents relation between (displacement-time) for two
objects A, B. calculate the velocity of the two bodies (A, B) through the first 3 s.
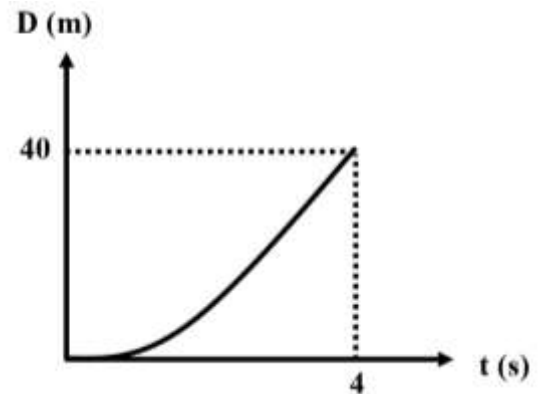
14

30- Two models represent covered displacement of two different bodies. What is the type of velocity of each body?

A   B

31- The opposite graph illustrates the motion of an object that started its motion from rest with a uniform acceleration, so the acceleration, so the acceleration of its motion is…………

a) 5 m/s^2
b) 4 m/s^2
c) 10 m/s^2
d) 5 m/s^2

D (m)

40

4   t (s)

32- A body falls freely from the top of a building and reaches the ground after time (T), if the resistance of air is neglected, which of the following figures represents the change of its velocity with time?

(a)   (b)   (c)   (d)

T   T   T   T

√

15
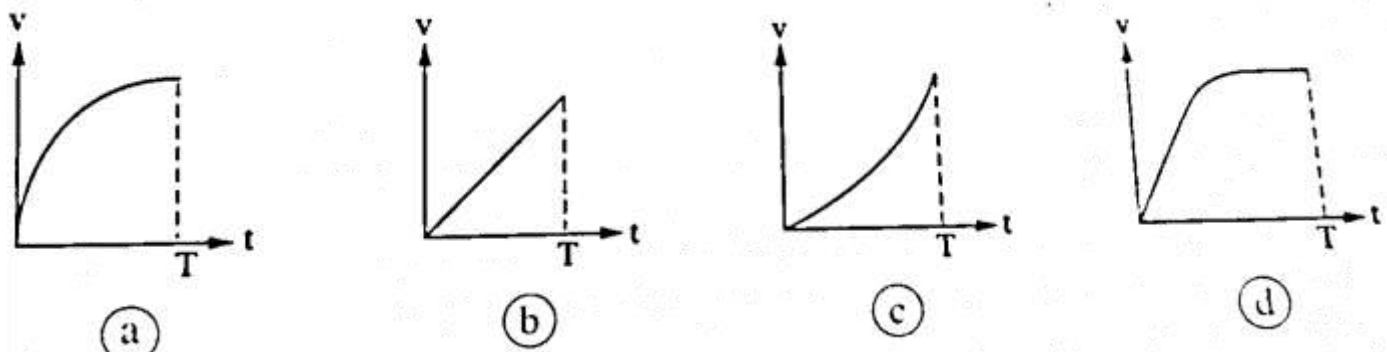
33- A car starts its motion from rest with a uniform acceleration until its velocity reaches (v) then it continues its motion with uniform velocity for a while before the driver applies the brakes to decrease its velocity uniformly till it stops, which of the following graphs describes the motion of the car accurately?

(a)   (b) √   (c)   (d)
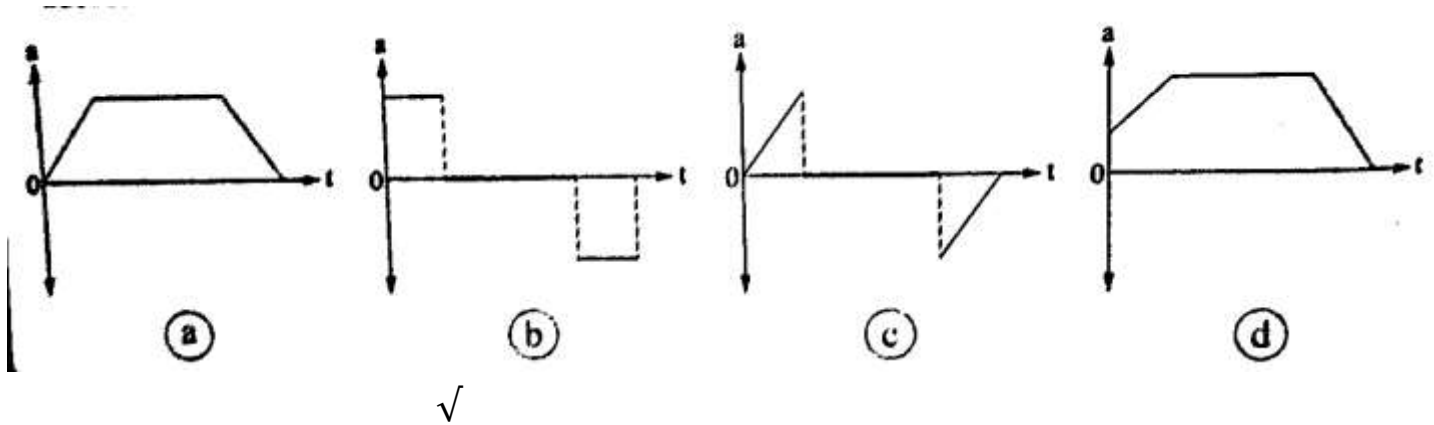
34- if body (x) acting on another body (y) by force of 9 N, then the reaction force of body y on body x equals............
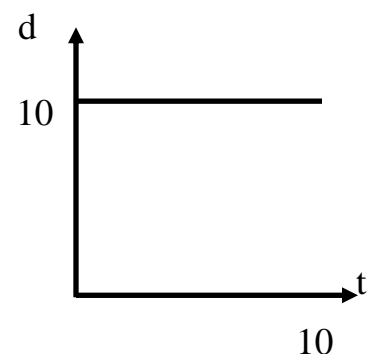
    a) 1 N   b) 0 N   c) 9 N   d) – 9 N

35- A car of mass 1000kg moves with a uniform velocity of 12 m/s to the east. The resultant force acting on the car is ....N

    a) 12000   b) 1200   c) 1012   d) 0

36- The opposite figure illustrates the (d-t) graph for object of mass 2-kg , so the resultant force acting on it is ....

    a) 100 N   b) 200N

    c)102N   d) 0

37- The body is equilibrium when ....
    a) The resultant of the forces that acts on it equals zero
    b) It is static
    c) It moves with uniform velocity in straight line
    d) All the pervious

38- A car is moving on horizontal road with a uniform velocity of 10m/s is affected by frictional force of 1500 N , so the force by which the engine acts on the car is ....
    a) 150N   b)1500N   C) 15000N   d) 0

39- The opposite figure shows the collision of the two bodies X and Y which have masses of m and 4 m respectively. If the body X acts on the body Y during the collision by force F. then the body Y acts on the body X by force
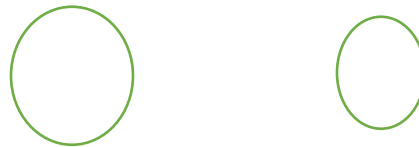
                    X   Y

a) F   b) 1/4F   C) 4F   d) –F

40- If the Earth acts on you while your motion by 600 N In your body acts on the Earth by force of ....
    A) Zero   b) 300N   C) 600 N   D) 1200N