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CSCA 样题-物理

选择题（每小题共有 4 个选项，其中只有 1 个选项是正确的。）

1．下列说法正确的是(　　).

A．有力作用在物体上，其运动状态一定改变

B．只有一个物体有时也能产生力的作用

C．作用在同一物体上的力，只要大小相同，作用的效果就相同

D．只要有力，一定存在施力物体和受力物体

2．一根弹簧的弹性系数为 200 N/m，若弹簧伸长量为 0.2 m，则需要使用多大的力(　　).

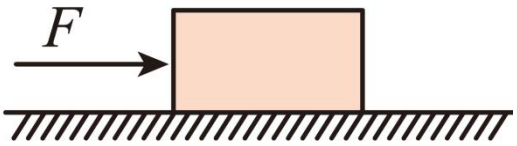
A. 4000 N

B. 400 N

C. 40 N

D. 4 N

3．如图所示，质量为 6 kg 的物体静止在水平桌面上，对它施加一个水平向右大小为 10 N 的力 F，物体与地面之间的动摩擦因数为 $\mu = 0.2$，重力加速度为 10 m/s^2，则物体所受到的合力为(　　).



A．22 N，水平向右

B．0 N

C．2 N，水平向左

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D．2 N，水平向右

4．一个质点受到三个水平力的作用，这三个力的大小分别为 3 N、4 N 和 5 N。则这三个力合力的最小值和最大值分别为(　　).

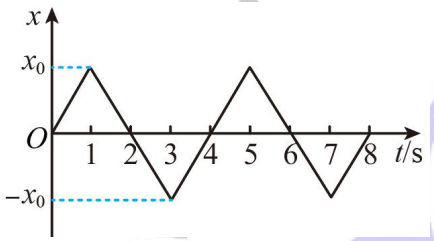
A．0，10 N

B．2 N，10 N

C．0，12 N

D．2 N，12 N

5．某直线运动物体的位移—时间图象如图所示，则物体(　　).



A．一直朝某一方向做直线运动

B．速度一直保持不变

C．做来回的运动

D．不能确定物体的运动情况

6．一个物体做自由落体运动，如果 $g = 10\ \mathrm{m/s^2}$，则物体在 5 秒末的速度大小为(　　).

A. 20 m/s

B. 30 m/s

C. 40 m/s

D. 50 m/s

7．　质点以速度$v = 4\ \mathrm{m \cdot s^{-1}}$做匀速圆周运动，圆周运动的半径$R =$

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1 m，则圆周运动的周期 T 为(　　).

A．3π s

B．2π s

C．π s

D．0.5π s

8．波长为 4 m 的机械波，传播速度为 120 m/s，则它的频率是(　　).

A. 30 Hz

B. 48 Hz

C. 300 Hz

D. 480 Hz

9．用 35 N 的水平拉力 F 拉一个质量为 5 kg 的物体，物体在光滑的水平面上前进了 10 m，则物体的动能(　　).

A．增加 350 J

B．减少 350 J

C．增加 500 J

D．不变

10．两个电阻并联后的总电阻的阻值为 R=30 Ω，其中一个电阻的阻值 R_1=60 Ω，则另一个电阻的阻值为(　　).

A. 20 Ω

B. 30 Ω

C. 60 Ω

D. 90 Ω

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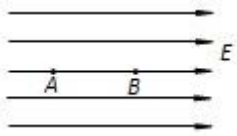
11．如图示，在电场强度为 E 的匀强电场中，一个电荷量为 q 的正点电荷，沿电场线方向从 A 点运动到 B 点，A、B 两点间的距离为 d，在此过程中电场力对电荷做的功等于(　　).



A. $\frac{Ed}{q}$

B. $\frac{qE}{d}$

C. qEd

D. $\frac{qd}{E}$

12．A、B、C 三点同一直线上，一个物体自 A 点开始做匀加速运动，A 点速度为 0，经过 B 点时速度 2 m/s，到 C 点时速度为 4 m/s，则 AB、BC 两段距离大小之比为(　　).

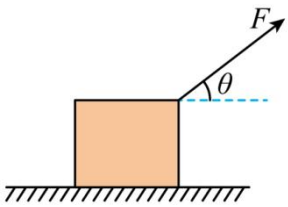
A. 1:4

B. 1:2

C. 1:3

D. 1:1

13．物体受到如图所示的恒力 F 的作用，在光滑的水平面上运动，在时间 t 内(　　).



A. 重力的冲量大小一定为 $Ft\sin\theta$

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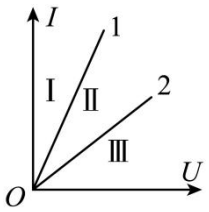
B. 拉力冲量的大小为 $Ft\cos\theta$

C. 支持力冲量的大小为 mgt

D. 合力的冲量水平向右

14．两只定值电阻 R_1、R_2 的 I-U 图像，如图所示。有关 R_1、R_2 的大小，及它们串联或并联后的 I-U 图像所在区域，下列判断正确的是(　　).



A．$R_1>R_2$，并联后在III处

B．$R_1>R_2$，并联后在II处

C．$R_1<R_2$，串联后在III处

D．$R_1<R_2$，串联后在I处

15．一台电动机，额定电压是 100 V，电阻的阻值是 2 Ω，正常工作时，通过的电流是 3 A，则电动机因发热损失的功率为(　　).

A. 18 W

B. 200 W

C. 300 W

D. 5000 W

16．一平行板电容器充电后与电源断开，负极板接地，在两极板间有一正电荷（电荷量很小）固定在 P 点，如图所示，以 E 表示两极板间的场强，U 表示电容器的电压，E_P 表示正电荷在 P 点的电势能，若保持负极板不动，将正极板移到图中虚线所示的位置，则下列说

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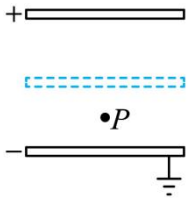
法正确的是(　　).



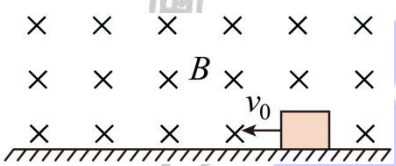
A．U 变小，E 变小

B．E 不变，E_P 不变

C．U 变小，E_P 变大

D．U 不变，E_P 不变

17．在$B=2\ \mathrm{T}$ 的匀强磁场中，一质量 $m=1\ \mathrm{kg}$ ，带正电 $q=1\ \mathrm{C}$ 的物体沿光滑的绝缘水平面以初速度 $v_0=10\mathrm{m/s}$ 向左运动，$g=10\ \mathrm{m/s^2}$，如图所示，运动过程中物体受合力的大小为(　　).



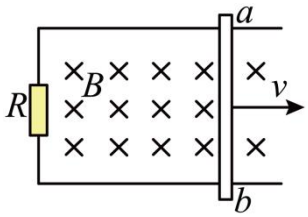
A．10 N

B．20 N

C．30 N

D．0 N

18．如图所示，水平放置的平行金属导轨的两端接有电阻 R，导线 ab 能在框架上无摩擦地滑动，匀强磁场垂直穿过框架平面，当 ab 匀速向右运动时，以下说法中正确的是(　　).



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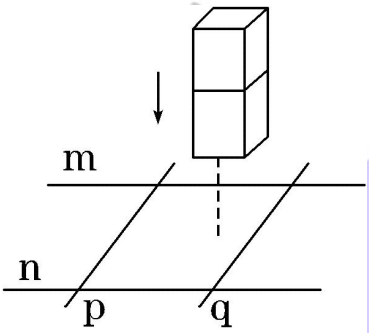
A．导线 *ab* 除受拉力作用外，还受磁场力的作用

B．导线 *ab* 运动速度越大，所需拉力越小

C．导线 *ab* 运动速度一定，若将电阻阻值 *R* 增大，则拉动导线 *ab* 的力可增大一些

D．只要使导线 *ab* 运动达到某一速度后，撤去外力，导线 *ab* 也能在框架上维持匀速运动

19．如图所示，光滑固定导轨 *m*、*n* 水平放置，两根导体棒 *p*、*q* 平行放于导轨上，形成一个闭合回路。当一条形磁铁从高处下落接近回路时（不计空气阻力）(　　).



A．*p*、*q* 将不动

B．*p*、*q* 将互相远离

C．磁铁下落的加速度仍为 *g*

D．磁铁下落的加速度小于 *g*

20．穿过固定不动的线框的磁通量随时间变化的规律如图所示，下列说法正确的是(　　).

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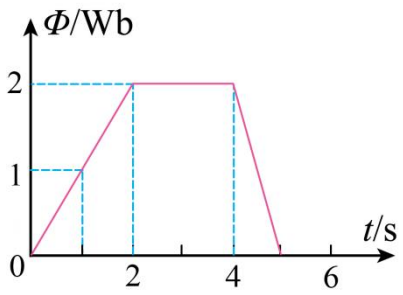

A．第 1 s 末感应电动势的大小等于 2 V

B．第 1 s 内和第 2 s 内，感应电动势一样大

C．2 s 末到第 4 s 末这段时间内，感应电动势最大

D．第 5 s 内感应电动势比最初 2 s 内感应电动势大，且方向相同

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参考答案

1	2	3	4	5	6	7	8	9	10
D	C	B	C	C	D	D	A	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	C	D	C	A	B	D	A	D	B

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Physics

Multiple-Choice Questions (Each question has four options among which only one of them is correct.)

1. Which of the following statements is correct? ( ).

A． When a force acts on an object, its motion state must change

B． Only one object can sometimes generate force

C． The force acting on the same object, as long as it is of the same magnitude, has the same effect

D． As long as there is force, there must be objects applying force and objects receiving force

2．The elasticity coefficient of a spring is 200 N/m. If the spring extends by 0.2 m, how much force is needed? ( ).

A. 4000 N

B. 400 N

C. 40 N

D. 4 N

3． As shown in the figure, an object with a mass of 6 kg is stationary on a horizontal tabletop, and a force F of 10 N is applied horizontally to the right. The dynamic friction coefficient between the object and the ground is $\mu = 0.2$, and the gravitational acceleration is 10 m/s^2. Therefore, the resultant force acting on the object is ( ).

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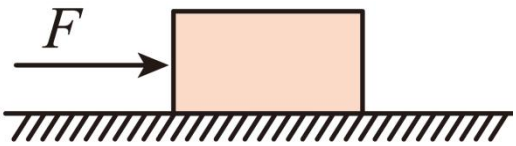


A．22 N，horizontally to the right

B．0 N

C．2 N，horizontally to the left

D．2 N，horizontally to the right

4. A particle is subjected to three horizontal forces, with magnitudes of 3 N, 4 N, and 5 N, respectively. The minimum and maximum values of the combined force of these three forces are (　　).

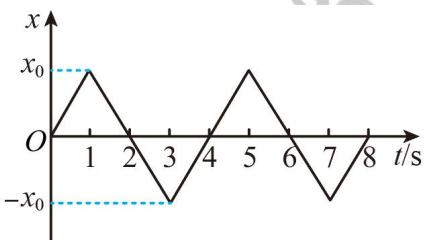
A．0，10 N

B．2 N，10 N

C．0，12 N

D．2 N，12 N

5．If the displacement-time graph of a moving object in a straight line is shown in the figure, then (　　).



A．the object is always moving in a straight line in a certain direction

B．the velocity of the object remains constant

C．the object is doing back and forth movements

D．it is impossible to determine the object's motion

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6． When an object undergoes a free fall motion, if g=10 m/s^2, the velocity of the object at the end of 5 seconds is (　　).

A. 20 m/s

B. 30 m/s

C. 40 m/s

D. 50 m/s

7． A particle moves uniformly in a circular motion at a speed of $v = 4\ \mathrm{m} \cdot \mathrm{s}^{-1}$, and the radius of the circular motion is 1. Therefore, the period T of the motion is (　　).

A． 3π s

B． 2π s

C． π s

D． 0.5π s

8． A mechanical wave with a wavelength of 4 m and a propagation speed of 120 m/s has a frequency of (　　).

A. 30 Hz

B. 48 Hz

C. 300 Hz

D. 480 Hz

9． Using a horizontal pulling force F of 35 N to pull an object with a mass of 5 kg, if the object moves forward 10 meters on a smooth horizontal plane, then the kinetic energy of the object (　　).

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A．increases by 350 J

B．decreases by 350 J

C．increases by 500 J

D．remains unchanged

10．The total resistance value of two resistors connected in parallel is R=30 Ω. If the resistance value of one resistor is R_1=60 Ω, then the resistance value of the other resistor is (　　).

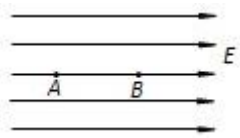
A. 20 Ω

B. 30 Ω

C. 60 Ω

D. 90 Ω

11．As shown in the diagram, in a uniformly strong electric field with an electric field strength of E, a positive point charge with a charge quantity of q moves along the direction of the electric field line from point A to point B. The distance between points A and B is d. During this process, the work done by the electric field force on the charge is equal to (　　).



A. $\frac{Ed}{q}$

B. $\frac{qE}{d}$

C. qEd

D. $\frac{qd}{E}$

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12． On the same straight line at points A, B and C, an object undergoes uniform acceleration motion starting from point A, with a velocity of 0 at point A. When passing through point B, the velocity is 2 m/s, and when reaching point C, the velocity is 4 m/s. Therefore, the ratio of the distances between AB and BC is (　　).

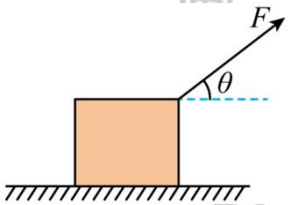
A. 1:4

B. 1:2

C. 1:3

D. 1:1

13．The object is subjected to a constant force F as shown in the figure, moving on a smooth horizontal plane within time t, then (　　).



A. the impulse of gravity must be $Ft\sin\theta$

B. the impulse of the tension is $Ft\cos\theta$

C. the impulse of the reaction force is mgt

D. the impulse of the resultant force has a direction to the right

14．The I-U graphs of two fixed resistors R_1 and R_2 are shown in the figure. Which of the following statements is correct regarding the size of R_1 and R_2, as well as the position where their I-U graphs are located when the resistors are connected in series or parallel? (　　).

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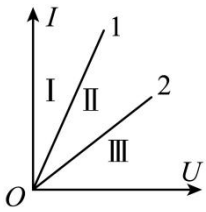

A. $R_1>R_2$, in Region III when connected in parallel

B. $R_1>R_2$, in Region II when connected in parallel

C. $R_1<R_2$, in Region III when connected in series

D. $R_1<R_2$, in Region I when connected in series

15. A motor with a rated voltage of 100 V and a resistance value of 2 Ω. When operating normally, the current passing through it is 3 A. The power loss of the motor due to heating is ( ).

A. 18 W

B. 200 W

C. 300 W

D. 5000 W

16. After charging a parallel plate capacitor, it is disconnected from the power supply and the negative plate is grounded. There is a positive charge (with a small amount of charge) fixed at point P between the two plates, as shown in the figure. E represents the field strength between the two plates, U represents the voltage of the capacitor, and E_P represents the potential energy of the positive charge at point P. If the negative plate is kept stationary and the positive plate is moved to the position shown by the dotted line in the figure, which of the following statements is correct? ( ).

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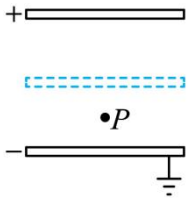


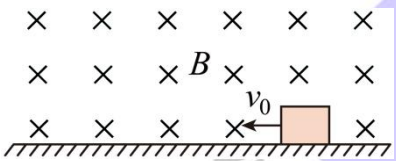
A. U decreases, E decreases

B. E unchanged, E_P unchanged

C. U decreases, E_P increases

D. U unchanged, E_P unchanged

17. In a uniformly strong magnetic field of $B = 2$ T, an object with a mass of m = 1 kg and a positive charge of q = 1 C moves to the left along a smooth insulated horizontal plane at an initial velocity of $v_0 = 10\text{m/s}$, as shown in the figure. Taking $g = 10\ \text{m/s}^2$, the magnitude of the resultant force acting on the object during the motion is ( ).



A. 10 N

B. 20 N

C. 30 N

D. 0 N

18. As shown in the figure, the two ends of parallel metal rails placed horizontally are connected with a resistor R. The wire ab can slide on the frame without friction, and a uniform magnetic field passes vertically through the frame plane. When ab moves uniformly to the right, which of the following statements is correct? ( ).

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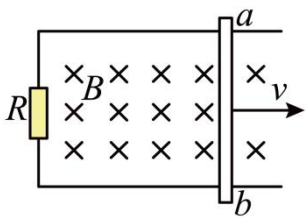


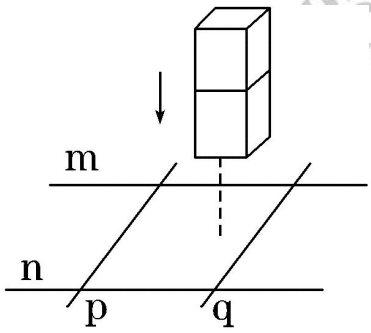
A． Wire ab is not only subjected to tension force, but also to magnetic field force

B．The higher the speed of wire ab's movement, the smaller the required pulling force

C． The movement speed of wire ab is constant. If the resistance value R is increased, the force pulling wire ab can be increased

D． As long as the wire ab reaches a certain speed and the external force is removed, the wire ab can also maintain a uniform motion on the frame

19． As shown in the figure, the smooth fixed rails m and n are placed horizontally, and two conductor bars p and q are placed parallel on the rails to form a closed loop. When a bar magnet falls from a height and approaches the circuit (regardless of air resistance) , (　　).



A． p and q will not move

B． p and q will move away from each other

C． the acceleration of the magnet falling is still g

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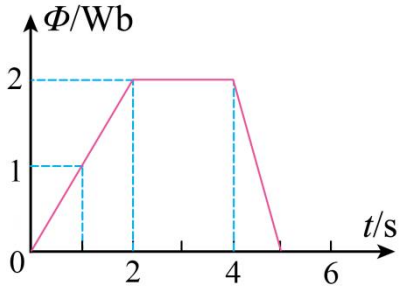
D. the acceleration of the magnet falling is less than g

20. The pattern of the magnetic flux passing through a fixed and stationary wire frame over time is shown in the figure. Which of the following statements is correct? ( ).



A. The magnitude of the induced electromotive force at the end of 1 s is equal to 2 V

B. Within 1 s and 2 s, the induced electromotive force is the same

C. During the period from the end of 2 seconds to the end of 4 seconds, the induced electromotive force is at its maximum

D. The induced electromotive force within the 5th second is greater than the induced electromotive force within the first 2 seconds, and the direction is the same

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参考答案

1	2	3	4	5	6	7	8	9	10
D	C	B	C	C	D	D	A	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	C	D	C	A	B	D	A	D	B

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