A

1 **A rigid body is subjected to a non-zero constant net force F. Which one of the following properties of the body will be constant?**

A) Acceleration
B) Position
C) Speed
D) Velocity
E) Momentum

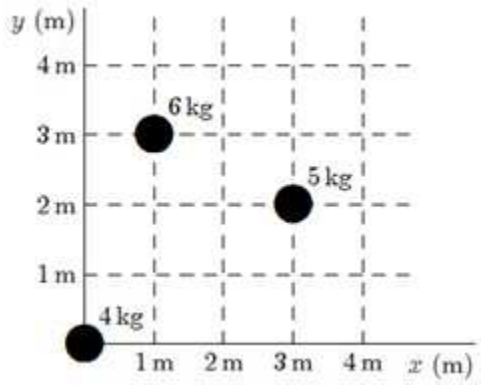
2 **A box has a mass of 22.2 kg. It is sitting on an icy sidewalk, which constitutes a horizontal frictionless surface. A spring with a spring constant of 103 N/m is attached to the box and pulled horizontally, so that the box accelerates at 1.31 m/s2.**

How much does the spring stretch?

A) 0.28 m
B) 0.38 m
C) 1.1 m
D) 2.7 m
E) 3.1 m

A

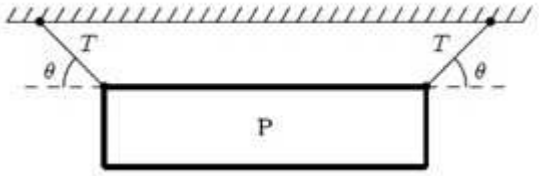
3



The x and y coordinates of the center of mass of the three-particle system shown below are

A) 0, 0
B) 1.4m, 1.9m
C) 1.9m, 2.5m
D) 1.3m, 1.7m
E) 1.4m, 2.5m

4



A picture P of weight W is hung by two strings as shown. The magnitude of the tension in each string is T. The total upward pull of the strings on the picture is:

A) (T+W)cosθ
B) 2Wcosθ
C) 2Wsinθ
D) 2Tsinθ
E) 2Tcosθ

A

5 **A Newton is equal to which of the following?**

A) kilogram-meter per second
B) kilogram per meter-second
C) meter per second squared
D) kilogram-meter per second squared
E) milligram-meter per second

6 **The mass of the parasitic wasp *Caraphractus cintus* can be as small as $5x10^{-6}$ kg. What is this mass in grams?**

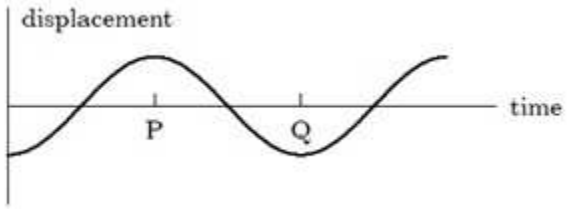
A) $5x10^{-4}$ g
B) $5x10^{-2}$ g
C) $3x10^{-5}$ g
D) $5x10^{-3}$ g
E) $5x10^{-1}$ g

7 **A boy throws a ball vertically upward with a velocity of 6 meters per second. How long does it take the ball to return to the boy's hand?**

A) 0.56 sec.
B) 1.75 sec.
C) 1.22 sec.
D) 2.50 sec.
E) 3.10 sec.

A

8



In the diagram above, the interval PQ represents:

A) wavelength/2
B) 2 × amplitude
C) wavelength
D) period/2
E) period

9 **Which of the following is NOT true for electromagnetic waves?**

A) They consist of changing electric and magnetic fields.
B) They travel at different speeds in vacuum.
C) They carry energy.
D) They have momentum.
E) They can be reflected.

10 **Light from any ordinary source (such as a flame) is usually:**

A) elliptically polarized
B) circularly polarized
C) plane polarized
D) unpolarized
E) monochromatic

A

11 **The reason that there are two slits, rather than one, in a Young's experiment is**

A) to increase the intensity.
B) to create a path length difference.
C) one slit is for electric fields, the other is for magnetic fields.
D) one slit is for frequency, the other for wavelength.
E) two slits in parallel offer less resistance.

12 **A sound wave has a wavelength of 3.0m. The distance from a compression center to the adjacent rarefaction center is:**

A) 0.75m
B) 3.0m
C) need to know wave speed
D) 1.5m
E) need to know frequency

13 **Interference of light is an evidence that**

A) light is a wave phenomenon.
B) light is electromagnetic in character.
C) the speed of light is very large.
D) light is a transverse wave.
E) light does not obey conservation of energy.

14 **Radio waves are readily diffracted around buildings whereas diffraction of light waves around buildings is negligible. This is because radio waves**

A) have much longer wavelengths than light waves.
B) have much shorter wavelengths than light waves.
C) are plane polarized.
D) are nearly monochromatic (single frequency).
E) are amplitude modulated.

15 **What do we call the greatest distance of a planet from the Sun?**

A) Aphelion
B) Eccentricity
C) Helix
D) Perihelion
E) Prolate

16 **A pulsar is actually a**

A) neutron star
B) white dwarf
C) black hole
D) red giant
E) supernova

17 **Which two properties of stars are directly compared by the Hertzsprung-Russel Diagram?**

A) Luminosity and density
B) Temperature and density
C) Size and density
D) Size and temperature
E) Luminosity and temperature

18 **Which of the following is not formed when a massive star, after reaching supergiant status, explodes?**

A) Neutron star
B) Type-II supernova
C) Supernova
D) White dwarf
E) Black hole

19 **The largest circular storm in our solar system is on the surface of which of the following planets?**

A) Uranus
B) Venus
C) Earth
D) Jupiter
E) Mercury

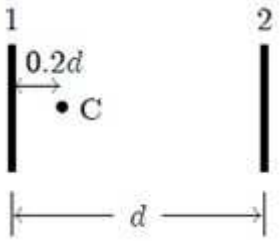
20 **What is the temperature of the cosmic background radiation, which is a remnant of the Big Bang?**

A) 1.2K
B) 2.7K
C) 50K
D) 0K
E) 100K

21 **The type of the Milky Way Galaxy is**

A) elliptical
B) spherical
C) spiral
D) barred-spiral
E) irregular

22



A candle C is placed between two parallel mirrors, a distance 0.2d from mirror 1. Here d is the distance between the mirrors. Multiple images of the candle appear in both mirrors. How far behind mirror 1 are the nearest three images of the candle in that mirror?

A) 0.2d, 0.8d, 1.4d
B) 0.2d, 2.2d, 4.2d
C) 0.2d, 1.8d, 3.8d
D) 0.2d, 1.8d, 2.2d
E) 0.2d, 1.8d, 3.4d

23 **When light passes from water into air, what happens to the speed, the wavelength and the frequency of light as it crosses the boundary?**

A) Speed : Increases
Wavelength : Increases
Frequency : Remains same

B) Speed : Remains the same
Wavelength : Remains the same
Frequency : Remains same

C) Speed : Increases
Wavelength : Decreases
Frequency : Increases

D) Speed : Increases
Wavelength : Increases
Frequency : Increases

E) Speed : Decreases
Wavelength : Decreases
Frequency : Decreases

24 **A parallel beam of monochromatic light in air is incident on a plane glass surface. In the glass, the beam:**

A) becomes diverging
B) follows a parabolic path
C) undergoes dispersion
D) remains parallel
E) becomes converging

25 **Interference of light is an evidence that**

A) light is a transverse wave.
B) light is a wave phenomenon.
C) the speed of light is very large.
D) light is electromagnetic in character.
E) light does not obey conservation of energy.

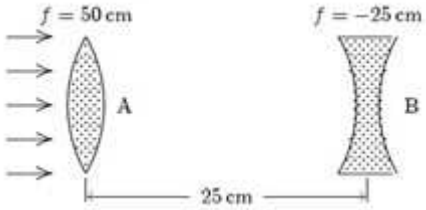
26 **The reason that there are two slits, rather than one, in a Young's experiment is**

A) to create a path length difference.
B) one slit is for electric fields, the other is for magnetic fields.
C) to increase the intensity.
D) one slit is for frequency, the other for wavelength.
E) two slits in parallel offer less resistance.

27 **When the distance between a point source of light and a light-meter is reduced from 6.0 m to 2.0 m, the intensity of illumination at the light-meter will be the original value multiplied by:**

A) 9
B) 1/9
C) 1/3
D) 3
E) 1

28



The two lenses shown are illuminated by a beam of parallel light from the left. Lens B is then moved slowly toward lens A. The beam emerging from lens B is

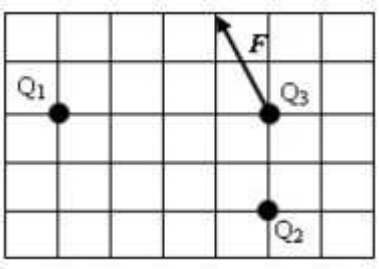
A) always diverging
B) initially parallel and then diverging
C) always parallel
D) initially converging and finally parallel
E) initially converging and finally diverging

29 **Electric current may be expressed in which one of the following units?**

A) J/C
B) Ω/s
C) Ω/V
D) C/V
E) C/s

A

A

30 

Charges Q_1 and Q_2 exerts a resultant force of F on Q_3. Which statement is true for charges of Q_1, Q_2 and Q_3?

A) Q_1 : +
Q_2 : -
Q_3 : +

B) Q_1 : +
Q_2 : +
Q_3 : +

C) Q_1 : +
Q_2 : -
Q_3 : -

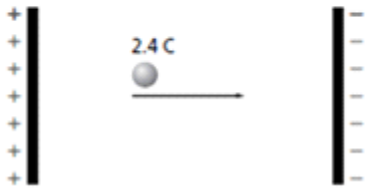
D) Q_1 : -
Q_2 : +
Q_3 : -

E) Q_1 : -
Q_2 : -
Q_3 : -

31 **In a certain region of space, the electric field is zero. From this what can we conclude for the electric potential in this region?**

A) negative
B) zero
C) positive
D) constant
E) infinite

32 **Once $2.4C$ of charge is moved from the positive plate to the negative plate, $120J$ of work is done by the electric force. What is the potential difference between the plates?**



A) $576\ V$
B) $288\ V$
C) $5\ V$
D) $50\ V$
E) $0.02\ V$

33 **Two resistors, which have 16Ω and 20Ω resistances, are connected as parallel. If the applied voltage to that parallel combination is 80V, find the value of the current passing through the 16Ω resistor.**

A) 0.2A
B) 0.8A
C) 1.25A
D) 5A
E) 8A

34 **Two identical conducting spheres, A and B, carry equal charge. They are initially separated by a distance much larger than their diameters, and the magnitude of the force between them is F. A third identical conducting sphere, C, is uncharged. Sphere C is first touched to A, then to B and then removed. As a result the magnitude of the force between A and B is equal to**

A) 3F/8
B) F/16
C) 0
D) F/4
E) F/2

35 **A parallel-plate capacitor has a plate area of 0.2 m^2 and a plate separation of 0.1 mm. If the charge on each plate has a magnitude of 4×10^{-6} C the potential difference across the plates is approximately:**

A) 0
B) 4×10^{-2} V
C) 1×10^{2} V
D) 2×10^{2} V
E) 4×10^{8} V

36 **According to relativity theory a particle of rest mass m with a momentum of 2mc has a speed of**

A) c
B) c/2
C) $2\sqrt{2}c$
D) 2c
E) $2c/\sqrt{5}$

37 **273 cm^3 of an ideal gas is at 0°C. It is heated at constant pressure to 10°C. It will now occupy**

A) 283 cm^3
B) 263 cm^3
C) 273 cm^3
D) 278 cm^3
E) 293 cm^3

38 **An automobile tire is pumped up to a gauge pressure of 1 atm when the temperature is 27°C. What is its gauge pressure after the car has been running on a hot day so that the tire temperature is °C ? (*Assume that the volume remains fixed and take atmospheric pressure to be 1.013 × 10^5 Pa.*)**

A) 1.6×10^5 Pa
B) 3.6×10^5 Pa
C) 2.6×10^5 Pa
D) 5.9×10^5 Pa
E) 7.9×10^5 Pa

39 **At the end of 14 min, 1/16 of a sample of radioactive polonium remains. The corresponding half-life is:**

A) (7/4) min
B) (7/8) min
C) (8/7) min
D) (7/2) min
E) (14/3) min

40 **Fusion is difficult to achieve. What is the reason?**

A) The nucleus will collapse together.
B) The presence of electrons hinders the fusion.
C) The nuclei will repel each other.
D) There is a lack of hydrogen atom.
E) The hydrogen atoms form a stable hydrogen molecule.

41 **A sample of bedlum consists of 3×10^{11} atoms. It emits alpha particles and its activity is worked out to be 1×10^{8}Bq. Calculate the decay constant, *λ, of the bedlum.***

A) $5.9 \times 10^{-4}\ s^{-1}$
B) $7.9 \times 10^{-4}\ s^{-1}$
C) $8.6 \times 10^{-4}\ s^{-1}$
D) $3.9 \times 10^{-4}\ s^{-1}$
E) $3.3 \times 10^{-4}\ s^{-1}$

42 **Which of the following is measured in 1 Sievert (1Sv)?**

A) Number of α-particles per second
B) J/mol
C) kg/J
D) J/kg
E) Number of α-particles per J

43 **A nucleus with mass number A and atomic number Z emits an alpha particle. The mass number and atomic number, respectively, of the daughter nucleus are:**

A) A − 4, Z
B) A − 2, Z − 2
C) A − 2, Z
D) A, Z − 2
E) A − 4, Z − 2

44 **What is the half life of radon-226? (The decay constant of the radon is**

$$\lambda = 1.36 \times 10^{-11} s^{-1})$$

A) 1.3×10^{6}s
B) 1.3×10^{10}s
C) 4.3×10^{12} s
D) 4.6×10^{13}s
E) 5.1×10^{11}s

45 **Which of the following is the unit Sievert?**

A) 1 radioactive decay per second
B) the number of radioactive particles absorbed by 1kg of human cells
C) the number of Joules of absorbed energy for 1 kg of human cells
D) the number of damaged cells per 1kg human cells
E) the half-life time for a radioactive particle

A

A

46 **In the reactivity series, aluminium is a more reactive metal than iron. But it seems to be less reactive. The reason for this is;**

A) Iron gets more reactive when comes into contact with liquids.

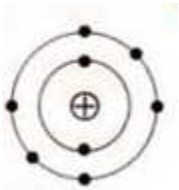
B) Aluminium is a harder metal so in practice, it reacts less.

C) In practice, Iron rusts easily than Aluminium.

D) An oxide layer is formed on the surface of Aluminium which prevents it to react further.

E) Aluminium has a higher boiling point than Iron that makes it less reactive.

47



The electron configuration of X shown below. According to this which one is correct ?

A) X conducts heat.

B) The valency of X is -2.

C) X is a metal.

D) X in group 6A.

E) X reacts with dilute acids.

48 **Some acids are corrosive but some are not. Which one of the following is the correct common name and example for an acid that is not corrosive?**

A) Common name : Weak
Example : Ethanoic acid

B) Common name : Weak
Example : Sulfuric acid

C) Common name : Strong
Example : Sulfuric acid

D) Common name : Strong
Example : Ethanoic acid

E) Common name : Strong
Example : Methanoic acid

49 **Which one of the following is <u>not</u> an essential property for a fuel to be known as 'a good fuel'?**

A) Fuel that is transported and stored easily.

B) Fuel that is very expensive.

C) Fuel that is safe to use.

D) Fuel that gives out high amount of heat when burned.

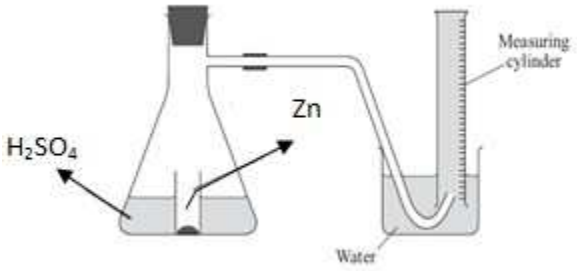
E) Fuel that easy to produce.

50 **K, L, M, N and Q are five elements with the electronic configurations;**
K : 2,8,1
L : 2
M : 2,8,8,1
N : 2,8,8
Q : 2,1

Which ones of these elements have similar chemical properties?

A) L and Q
B) K and L
C) K, M and Q
D) M and N
E) M, N and Q

51



The following figure shows the reaction of zinc with dilute sulfuric acid. What are the names of the collection method and the gas produced?

A) Name of method : Upside down tube
Gas : H_2
B) Name of method : Collect over water
Gas : O_2
C) Name of method : Upward delivery
Gas : O_2
D) Name of method : Collect over water
Gas : SO_2
E) Name of method : Collect over water
Gas : H_2

52 **Alloys are much harder substances than pure metals. Which one of the following best describes the reason why alloys are harder substances than pure metals?**

A) The particles are packed so tightly that they can not move.
B) The particles have different sizes so they can not slide over each other.
C) The melting point becoms so high that you need to put high energy to melt them.
D) The shape of an alloy is not fixed so it is almost impossible to melt them.
E) The particles can slide over each other but thay can not vibrate.

53 **The reason 'why alkali metals show similar chemical properties' is;**

A) They have one electron in their outer shells.
B) They are light so can float on water.
C) They have low melting points compared to other metals.
D) They are very soft and can be cut with a knife.
E) They short off one electron to complete their outer shells.

54 **The substance that change colour when an acid or an alkali is added is known as;**

A) Amphoteric
B) Fat
C) Initiator
D) Soluble base
E) Indicator

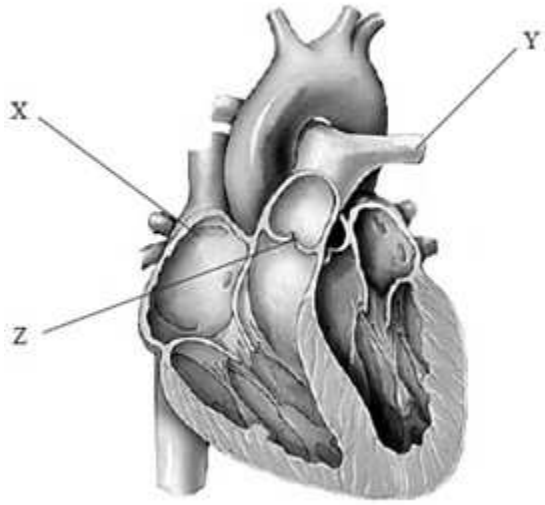
A

55 **Which one of the following is <u>not</u> a property of a halogen element?**

A) Has coloured vapour.
B) Very reactive.
C) Shows alkaline properties.
D) Forms diatomic molecule.
E) Found in Group 7 of the periodic table.

A

56



The diagram above shows the human heart. What structures are indicated by the labels X, Y, Z?

A) X : right atrium
Y : pulmonary artery
Z : atrioventricular valve

B) X : right atrium
Y : aorta
Z : semi-lunar valve

C) X : left atrium
Y : aorta
Z : atrioventricular valve

D) X : right atrium
Y : pulmonary artery
Z : semi-lunar valve

E) X : left atrium
Y : aorta
Z : semi-lunar valve

57 Which blood vessel takes blood away from the heart to the lungs?

A) Pulmonary Vein
B) Aorta
C) Pulmonary Artery
D) Vena Cava
E) Coronary Artery

58 Chemical digestion begins in the

A) esophagus.
B) stomach.
C) gall bladder.
D) mouth.
E) small intestine.

59 Which is not a primary function of protein molecules?

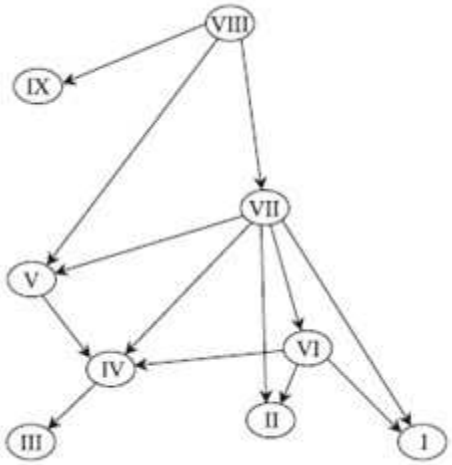
A) Some hormones
B) Enzymes
C) Energy storage
D) Transport
E) Keratin

60 Which muscle action is associated with an increase in the volume of the thoracic cavity during inspiration?

A) The diaphragm contracts.
B) The internal intercostal muscles contract
C) The external intercostal muscles relax.
D) The diaphragm relaxes.
E) The external and internal intercostal muscles relax

A

61



The diagram above is a simplified version of a food web from Chesapeake Bay.
The arrows indicate the direction of energy flow and the numbers indicate species within the food web.

Which of the species feed both as secondary consumers and as tertiary consumers?

A) I, II and IV only
B) I, III and V only
C) III, IV and V only
D) I, IV and V only
E) I, II and V only

62 Which kind of molecule could be an enzyme?

A) starch
B) glucose
C) protein
D) fat
E) water

A

63 **Which of the following tissues contains the highest number of mitochondria?**

A) nervous
B) connective
C) muscle
D) skin
E) bone

64 **Which are needed for seed germination?**

A) soil particles and mineral salts
B) chlorophyll and light
C) water, oxygen and a suitable temperature
D) carbon dioxide and oxygen
E) carbon dioxide and chlorophyll.

65 **How can human immunodeficiency virus (HIV) get transmitted from one human to another?**

I. By touching the skin of an infected person
II. Through drinking contaminated water
III. Through the exchange of body fluids
IV. From mother to child across the placenta

A) III and IV only
B) II and III only
C) I and III only
D) I, III and IV only
E) I, II, III and IV

TEST BİTTİ
CEVAPLARINIZI KONTROL EDİNİZ