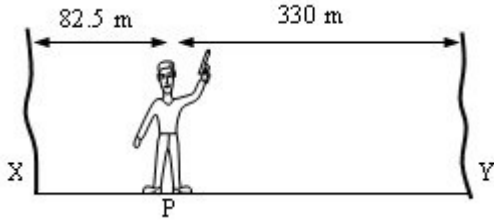


A

1



A man standing between two cliffs X and Y at the point P fires a pistol as in the above figure. If the speed of sound in air is 330 m/s, the first two echoes which he hears will be separated by a time interval, in seconds, of

- A) 0.5
- B) 1.25
- C) 0.75
- D) 1.5
- E) 2.50

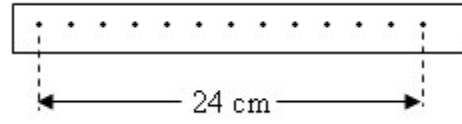
2

A 1245g block of wood rests on a table top. A 5g bullet moving horizontally with a speed of 600 m/s is shot into the block and sticks in it. The block slides 6 m along the table and stops. What is the friction force? ($g = 10 \text{ N / kg}$)

- A) 0.6 N
- B) 0.25 N
- C) 0.2 N
- D) 0.4 N
- E) 0.8 N

A

3



The tape in above figure was pulled through a ticker timer, which makes 50 dots per second, by a trolley travelling along a runway.

What is the average velocity of the trolley?

- A) 24 cm /s
- B) 1 m /s
- C) 48 cm /s
- D) 12 cm /s
- E) 5 cm /s

4

If a light source produces illumination on the ceiling 16 times greater than it produces on the floor. What is the height of the room in terms of the length (l) of the cable of the lamp?

- A) $8l$
- B) $5l$
- C) $10l$
- D) $4l$
- E) $12l$

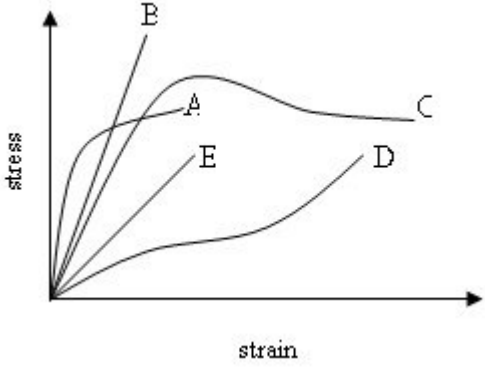
5

A force of 3800 N is required to move a vehicle of mass 1500 kg at constant speed along a horizontal road. In travelling 300 m along the road, the work, in kJ, done against frictional forces is

- A) 1140
- B) 5700
- C) 12.7
- D) 450
- E) 1.14×10^6

A

6



The above figure shows the stress-strain graphs for five different materials. Which material is toughest?

- A) A
- B) C
- C) D
- D) B
- E) E

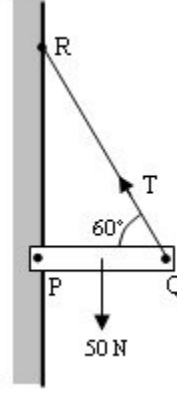
7

Which of the following is not a unit of power?

- A) Ω^2/V
- B) $A^2\Omega$
- C) AV
- D) J/s
- E) Nm/s

A

8

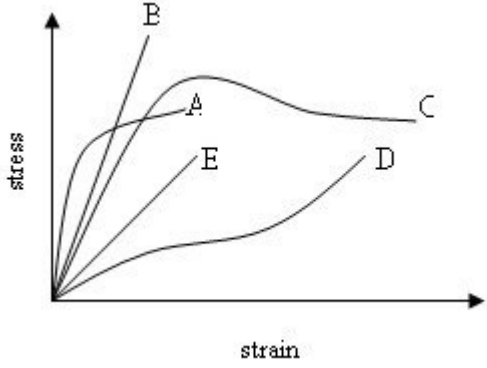


The above figure shows a horizontal rigid beam PQ of negligible mass, pivoted on the wall at P and tied by a string to point R. The string makes an angle of 60° with the beam. A load of 50 N is hung from the mid-point of the beam. The tension T in the string, in N, is
($\sin 60^\circ = 0.86$, $\cos 60^\circ = 0.5$, $\tan 60^\circ = 1.73$)

- A) 25
- B) 43
- C) 50
- D) 29
- E) 58

A

9



The above figure shows the stress-strain graphs for five different materials. Which material is strongest?

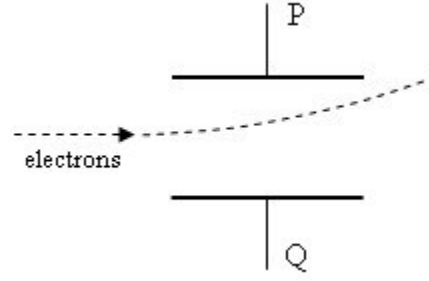
- A) C
- B) D
- C) A
- D) B
- E) E

10 What is the potential difference across the ends of a conductor of resistance 5Ω if 5×10^{18} electrons pass through it every second? ($e = 1.6 \times 10^{-19} \text{ C}$)

- A) 4 V
- B) 8 V
- C) 0.8 V
- D) 5 V
- E) 40 V

A

11



Which of the following statements about the deflection of the beam of electrons by the p.d. between the plates P and Q shown in above figure is/are true?

1. Plate P is negative
2. The deflection would be greater if the p.d. was greater
3. The deflection would be greater if the electrons are moving slower.

- A) 1, 3
- B) 1, 2, 3
- C) 1
- D) 2, 3
- E) 3

12 What is the sine of the critical angle for light passing from water to air? ($n_{\text{water}} = 4/3$)

- A) 0.750
- B) 0.720
- C) 0.632
- D) 0.866
- E) 0.500

A

13 A metal wire has a resistance of 2Ω at 10°C and 3Ω at 100°C . What is the temperature coefficient of the metal?

- A) $5.5 \times 10^{-3} \text{ 1/}^\circ\text{C}$
- B) $1.6 \times 10^{-2} \text{ 1/}^\circ\text{C}$
- C) $6.4 \times 10^{-4} \text{ 1/}^\circ\text{C}$
- D) $3.4 \times 10^{-3} \text{ 1/}^\circ\text{C}$
- E) $7.2 \times 10^{-4} \text{ 1/}^\circ\text{C}$

14 Which one of these statements is correct?

If a positively charged acetate strip is brought near the cap of a positively charged electroscope and then removed without touching it, the leaf is deflected....

- A) more and returns to its original deflection
- B) less and returns to its original deflection
- C) more and then falls to zero
- D) more and stays in that position
- E) less and stays in that position

15 An elevator of mass m is ascending with an acceleration of a . The friction force against its motion is f . What is the net force on the cable which carries the elevator?

- A) $mg - ma$
- B) $ma + mg + f$
- C) $ma - f$
- D) $mg + f$
- E) $mg - ma + f$

A

16 Hydrogen has energy levels of -0.54 eV and -1.51 eV . When an electron falls from the higher energy level to the lower energy level, the quantum emitted has a wavelength of approximately:

(Planck's constant $h = 6.6 \times 10^{-34} \text{ Js}$
 $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$, $c = 3 \times 10^8 \text{ m/s}$)

- A) $1.1 \mu\text{m}$
- B) $1.2 \mu\text{m}$
- C) $0.9 \mu\text{m}$
- D) $1.0 \mu\text{m}$
- E) $1.3 \mu\text{m}$

17 An ideal gas, initially at a temperature of 27°C , is heated until both pressure and volume are doubled. The final temperature, in $^\circ\text{C}$, is

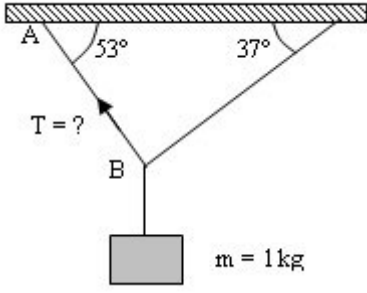
- A) 54
- B) 1200
- C) 927
- D) 108
- E) 1473

18 What is the real depth of a fish in a pool, if the apparent depth is 0.75 m ?
($n_{\text{water}} = 4/3$)

- A) 1.0 m
- B) 0.56 m
- C) 1.12 m
- D) 0.75 m
- E) 1.33 m

A

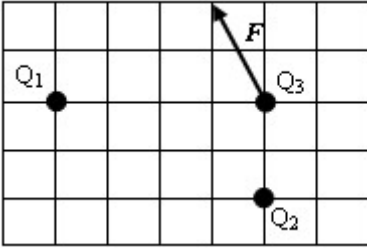
19



The above system is in equilibrium. What is the tension, T , in the string AB ? ($g = 10 \text{ N / kg}$)

- A) 0.8 N
- B) 4 N
- C) 0.6 N
- D) 6 N
- E) 8 N

20



Charges Q_1 and Q_2 apply a resultant force on the charge Q_3 as shown in the following figure. What is the ratio Q_2 / Q_1 ?

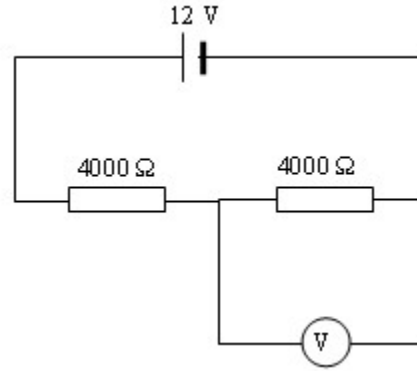
- A) $+ \frac{1}{4}$
- B) $- \frac{1}{4}$
- C) $+ \frac{1}{8}$
- D) $- \frac{1}{2}$
- E) $- \frac{1}{8}$

A

21 What is the size of the image produced by an object 5 mm high placed 200 mm in front of a convex lens of focal length 150 mm?

- A) 6.6mm
- B) 3 mm
- C) 10 mm
- D) 12 mm
- E) 15 mm

22

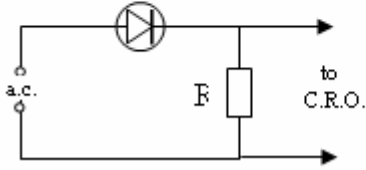


If the voltmeter in the circuit above has a resistance of 4000Ω , and if the internal resistance of the battery is negligible, what is the voltmeter reading?

- A) 6 V
- B) 5 V
- C) 0
- D) 4 V
- E) 8 V

A

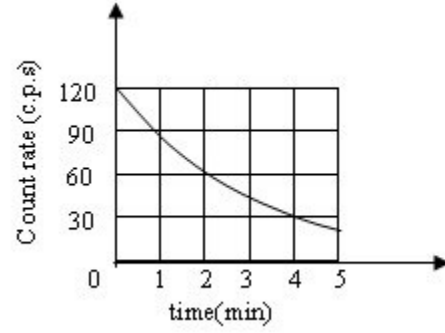
23 When a correctly adjusted C.R.O. is connected across R as in the below figure, which of the following waveforms is obtained?



- A)
- B)
- C)
- D)
- E)

A

24



The radioactive substance whose decay curve is given in above figure has a half-life in minutes of

- A) 3
B) 1
C) 4
D) 2
E) 5

25

Which one of the following describes particles in a solid at room temperature?

- A) Close together and vibrating
B) Far apart and stationary
C) Close together and moving about at random
D) Close together and stationary
E) Far apart and moving about at random

A

26 A steel rail has a cross-sectional area of 24 cm^2 . what is the resistance of 20 km, if the resistivity of steel is $3 \times 10^{-7} \Omega\text{m}$?

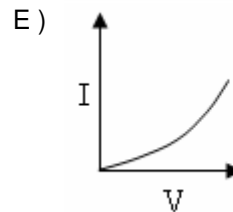
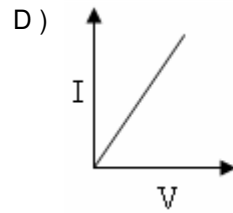
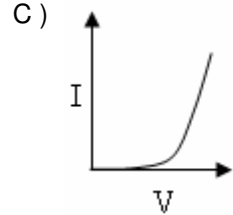
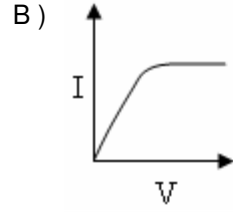
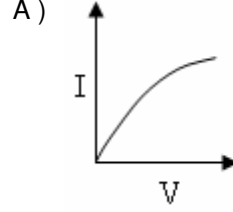
- A) 2500Ω
- B) 2.5Ω
- C) 25Ω
- D) 250Ω
- E) 25000Ω

27 Each of five cells has *emf* of 2 V and internal resistance of 0.6Ω . What current will they supply to an external resistance of 17Ω when they are connected in series?

- A) 0.5 A
- B) 0.2 A
- C) 0.1 A
- D) 0.3 A
- E) 0.57 A

A

28 Which one of the following sketches represents correctly, the I-V graph of a thermistor?



A

29 A generator produces 100 kW of power at a potential difference of 10 kV. The power is transmitted through cables of total resistance 5 Ω .

How much power is dissipated in the cables?

- A) 50 W
- B) 400 W
- C) 250 W
- D) 500 W
- E) 1000 W

30

A ray of light is incident on a plane mirror. The mirror is then rotated through an angle of 30°. The reflected ray will be turned through

- A) 60°
- B) 30°
- C) 45°
- D) 15°
- E) 75°

31 When a 2.0 kg block of metal at 600 °C is immersed in water at its boiling point (100 °C), 0.4 kg of steam is produced. Assuming that there are no heat losses to the surroundings and the specific latent heat of vaporization of water is 2.3×10^6 J/kg, the specific heat capacity of the metal, in J/(kg °C) is

- A) 7.67×10^4
- B) 9.20×10^2
- C) 9.20×10^4
- D) 7.67×10^2
- E) 2.30×10^8

A

32 A ray of light passes from air into water at an incident angle of 30°. Which one of the following quantities change?

I: Wavelength
II: Speed
III: Direction
IV: Frequency

- A) II
- B) I
- C) IV
- D) II, III
- E) I, II, III

33

The resistor fitted as a shunt across a moving-coil meter has a resistance which is 1/99 of the meter resistance. By what factor is the current range multiplied?

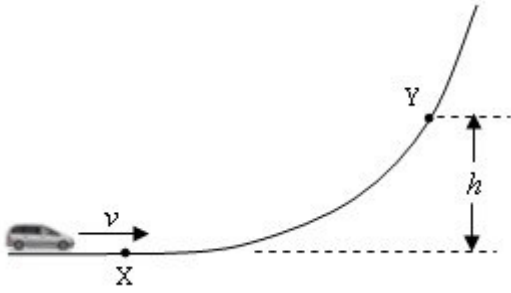
- A) 99
- B) 1/99
- C) 0.01
- D) 100
- E) 1000

34 A 60 W reading lamp gives out only 5% of its power as visible light. The visible light intensity at a distance of 1.5 m from the lamp in W/m² is (if necessary use $\pi = 3$)

- A) 1/6
- B) 1/9
- C) 1/3
- D) 4/3
- E) 20/3

A

35



A toy car of mass m passes a point X with a speed v and travels up a frictionless track to a point Y at a height h above X . A second toy car of mass $2m$ passes X with a speed $v/2$. To what height will it rise?

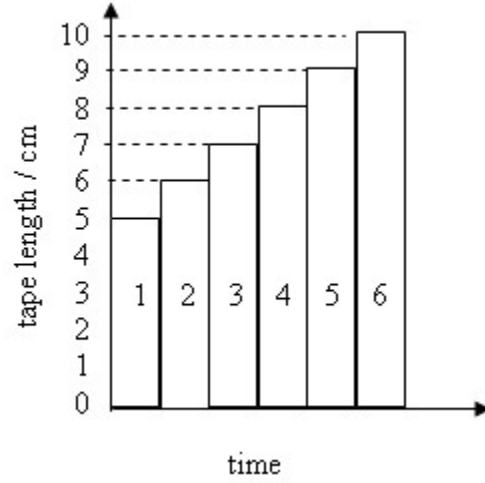
- A) $\frac{1}{4} h$
- B) $2 h$
- C) h
- D) $\frac{1}{2} h$
- E) $4 h$

36 To form a minimum on an interference pattern, the path difference from two coherent sources that are in phase could be:

- A) $\frac{3\lambda}{4}$
- B) $\frac{\lambda}{4}$
- C) $\frac{\lambda}{2}$
- D) λ
- E) 2λ

A

37

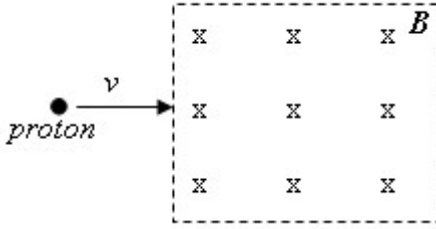


The tape in above figure was pulled through a ticker timer, which makes 50 dots per second, by a trolley travelling down a runway. The tape was cut off in ten tick lengths and used to form the following tape chart. The acceleration represented by the tape chart is

- A) 5 cm /s^2
- B) 20 cm /s^2
- C) 10 cm /s^2
- D) 15 cm /s^2
- E) 25 cm /s^2

A

38



A proton moves through a constant magnetic field as shown in the above figure.

Which one of the following statements is true?

- A) It is deflected downward
- B) The kinetic energy of proton increases
- C) It is deflected into page
- D) It is deflected out of page
- E) The kinetic energy of proton does not change

39 A charge of -4×10^{-6} C experiences an upward force of 30 N. What is the magnitude and direction of the electric field on the charge?

- A) 1.2×10^6 N/C, down
- B) 1.33×10^5 NC, up
- C) 75×10^4 N/C, down
- D) 7.5×10^6 N/C, down
- E) 120×10^6 N/C, down

A

40

A moving particle of mass m collides with a particle of mass M ($M > m$) which is initially stationary. As a result of the collision, the particle of mass m is brought to rest. The fraction of the original kinetic energy remaining after the collision is

- A) $(m/M)^{1/2}$
- B) 1
- C) $(1 - m/M)$
- D) 0
- E) m/M

41 Which of the following is a chemical change?

- A) Painting a metal surface
- B) Boiling an egg
- C) Dissolving sugar in tea
- D) Mixing sulphur powder with iron fillings
- E) Freezing water

42 In order to separate a mixture of sand and table salt, which property of water should be used?

- A) Expansion
- B) Solubility
- C) Transparency
- D) Boiling Point
- E) Density

A

43 Which is an example of a liquid - liquid solution?

- A) Steel
- B) Mothballs
- C) Antifreeze
- D) Air
- E) Pepsi

44 A particular element has these properties:

I- Floats in water

II- Burns in air

III- Shiny when cut

IV- Melts at 98°C

V- Good conductor of electricity

Which two of these properties suggest that the element is a metal?

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

45 Which of the following is WRONG about the halogens at room temperature?

- A) They all have 7 valence electrons.
- B) Chlorine is a pale green gas.
- C) Iodine is liquid.
- D) They are poisonous.
- E) Fluorine is the most reactive nonmetal.

A

46 Which is NOT always conserved during a chemical reaction?

- A) Electrical charge
- B) Mass
- C) Type of atoms
- D) Number of atoms
- E) Number of molecules

47 Element Potassium

mass number : 39

atomic number : 19

Which of the following is WRONG?

- A) It is neutral.
- B) It contains 19 protons.
- C) It contains 39 electrons.
- D) It can attain a charge of +1.
- E) It contains 20 neutrons.

48 Which of the following is WRONG about ionic bonds?

- A) In ionic bonds atoms share electrons.
- B) Sodium chloride has ionic bonding.
- C) In ionic bonds metals lose electrons.
- D) In ionic bonds nonmetals gain electrons.
- E) Ionic bonds occur between metal and nonmetal atoms.

A

- 49 I- Bromine
II- Water
III- Mercury
IV- Alcohol

The samples above are at room temperature.
Which is correct?

- A) II and IV are compounds.
B) Only II and IV are liquids.
C) II conducts electricity.
D) III is diatomic.
E) III is solid.
- 50 Which of the following electronic structure refers to that of a noble gas?
- A) 2.8.2
B) 2.8.4
C) 2.8.8
D) 2.2
E) 2.8.8.2
- 51 Which of the following is a function of the cerebellum?
- A) regulates heart beat
B) memory
C) controls breathing
D) controls balance
E) vision

A

- 52 I. Yeast : budding
II. Amoeba : binary fission
III. Strawberry: runner
IV. Potato : tuber
V. Hydro : regeneration

The information above shows the type of reproduction carried out by some organisms which is incorrect?

- A) II
B) IV
C) I
D) III
E) V
- 53 Ladybirds and snails feed on grass and they themselves are eaten by thrushes. Snails are also eaten by rabbits.
- Using the food web described, choose the incorrect statement below.
- A) There are 2 herbivores in the food web
B) Rabbits are secondary consumers
C) Rabbits are carnivores
D) Thrushes are tertiary consumers
E) If the number of snails decreases, the number of rabbits would also decrease

A

54 10 Which is not true for near sightedness

- A) Usually occurs when the eye lens cannot get thin enough
- B) occurs because the image is formed in front of the retina
- C) can be corrected by using diverging lenses
- D) Is caused by large or elongated eyeballs
- E) is referred to as long sight

55 regulates the rate of body function.

- A) Pituitary gland
- B) Pancreas
- C) Adrenal gland
- D) Thyroid gland
- E) Reproductive organs

56 All the organisms living in a habitat is called

- A) species
- B) ecosystem
- C) population
- D) community
- E) nonliving factors

A

57

recipient	James	Kate	Brian	Anne	Jessica
Blood type	0	A	B	B	AB

Using the table above, answer the following question.

If Ken has a blood type of A, who can he donate blood to?

- A) Only Kate
- B) Kate and Jessica
- C) James and Kate
- D) James, Kate and Jessica
- E) Only Jessica

58 Which of the gases does not cause global warming?

- A) carbondioxide
- B) hydroflourocarbons
- C) methane
- D) chloroflourocarbons
- E) none of the above

59 In which of the following locations are slightly movable joints found?

- A) Knee
- B) Shoulder
- C) Hip
- D) Elbow
- E) Neck

A

60 Which is not found in the middle ear.

- A) Eustachian tube
- B) stapes
- C) malleus
- D) ear canal
- E) oval window

TEST BİTTİ

CEVAPLARINIZI KONTROL EDİNİZ