PHYSICS QUESTION BANK

1. The rate of displacement is called

A. acceleration

B. deceleration

C. speed

D. velocity

1. Which of the following has its operation based on the effect of pressure on the boiling point of a liquid?

A. Air condition

B. barometer

C. pressure cooker

D. refrigerator

1. A copper rod with heat capacity of 975J/K is heated until its temperature rises from 25°C to 90°C, Calculate its mass.( sp. Ht. cap of copper = 390J/kg K)

A. 1.5

B. 2.5

C. 5.6

D. 8.4

1. Which of the following wave properties wave properties is responsible for the formation of a stationary wave?

A. diffraction

B. refraction

C. reflection

D. refraction

1. Density is a measure of the

A. quantity of matter an object contains

B. space an object occupies

C. compactness of matter with respect to its size

D. surface area of an object

1. When a body floats in a liquid, the

A. body displaces it own volume of the liquid

B. upthrust on it is greater than weight of the

C. weight of the liquid displaced is equal to that of the body D. weight of the body is very small

1. A crate of soft drink is pushed towards the left across the floor of a bottling company. The frictional force on the crate is directed

A. towards the left

B. towards the right

C. vertically upward

D. vertically downward

1. For a body in uniform circular motion with constant speed, the

A. acceleration is zero

B. velocity remains constant

C. velocity changes continuously

D. magnitude of the centripetal force changes

1. Which of the following physical quantities is a measure of the time rate of change of momentum?

A. energy

B. power

C. force

D. impulse

1. Which of the following situations is an example of a balanced force?

A. change in motion of a moving object

B. an accelerating object

C. net force on an object greater than zero

D. a light bulb hanging from a ceiling

1. Which of the following quantities is a measure of the area under a graph of force against distance?

A. momentum

B. velocity

C. energy

D. power

1. A pulley system has a velocity ratio of 4. Calculate the effort required by the system to lift a load of mass 2kg ( g = 10m/s²)

A.2N

B. 5N

C. 40N

D.80N

1. Which of the following angles of an inclined plane is best for loading barrels of oil into a truck?

A. 20°

B. 35°

C. 40°

D. 45°

1. A temperature of 20°C is equivalent to

A. 47°F

B. 59°F

C. 63°F

D. 68°F

1. The unit of volume expansivity is

A. /K

B. K/m²

C. Km²

D. m²

1. The silver coating on the inside of a vacuum reduces heat loss by

A. convection

B. conduction

C. evaporation

D. radiation

1. The equation of a wave form is given by y= 0.005sinπ (0.5x – 200t). Calculate the speed of the wave.

A. 100m/s

B. 200m/s

C. 250m/s

D. 400m/s

1. Which of the following objects is self-luminous?

A. plane mirror

B. shinning stone

C. sun

D. moon

1. In a resonance tube experiment, a vibrating turning fork produces first resonance for an air column of length 33cm. calculate the frequency of the turning fork ( speed of sound in air = 340m/s)

A. 257.6Hz

B.340.3Hz

C. 386.4Hz

D. 515Hz

1. The sound wave emanating from the prongs of a tuning fork are

A. transverse

B. longitudinal

C. forced vibration

D. electromagnetic

1. Which of the following devices can be referred to as the simple electrostatic generator

A. gold leaf electroscope

B. lightning conductor

C. proof plane

D. electrophorus

1. The commercial unit used for calculating bills for electricity consumed is the A. Wh

B. kWh

C. Ah

D. kV

1. Which of the following materials is not used as a dielectric in capacitor

A. glass

B. brass

C. paper foil

D. paraffix wax

1. Which of the following statements about the properties of line of force is not correct? They

A. originate and terminate in space

B. never intersect one another

C. repel one another sideways

D. are in a state of tension

1. The most suitable method of demagnetizing a magnet is by

A. heating

B. hammering

C. stroking with another magnet

D. placing it in a coil connected to an a.c source

1. A step-down transformer has primary windings of 400 turns and is connected to a 240V mains. Determine the voltage output, if the transformer has secondary windings of 200 turns

A. 120V

B. 140V

C. 160V D

. 180V

1. Which of the following conditions does not occur at resonance in an a.c RLC series circuit?

A. power factor is zero

B. there is maximum power

C. the impedance is minimum

D. maximum current flows

1. In which of the following situations is infrared waves not used?

A. Photography

B. Scientific research on atomic vibration

C. locating mineral deposit

D. radar systems

1. The term photon means

A. packet of light energy

B. light sensitive materials

C. light reflectors

D. light absorber

1. The change in mass of a nuclide involved in a nuclear reaction is 2 x 10⁻²⁷ kg. Calculate the energy produced ( velocity of light 3 x 10⁸m/s)

A. 1.8 x 10⁻¹⁰

B. 9 x 10⁻¹¹ C.

6 x 10⁻¹⁹

D. 1.2 x 10⁻⁴⁵

1. Peter adds 50 g of milk at 20°C to 350 g of tea at 80°C, what is the final temperature of the mixture?

Given: Specific heat capacity of milk = 3800 J kg–1 °C–1

Specific heat capacity of tea = 4200 J kg–1 °C–1

1. 50.0°C
2. 72.5°C
3. 73.1°C
4. 77.4°C
5. A stone falls from rest. Neglecting air resistance, the ratio of the distance travelled by the stone in the

1st second to that travelled in the 2nd second is

A. 1 : 1

B. 1 : 2

C. 1 : 3

D. 1 : 4

1. Which of the following phenomena demonstrates that light is an electromagnetic wave?

A. Light carries energy.

B. Light reflects when it meets a polished metal surface.

C. Light bends when it travels across a boundary from one medium into another.

D. Light can travel from the Sun to the Earth.

1. A battery of e.m.f. 3.0 V and internal resistance 2.0Ω is connected to a light bulb

of resistance 10.0 . A voltmeter of internal resistance 10 kΩ is connected in parallel with the light bulb. What is the reading of the voltmeter ?

A. 2.4 V

B. 2.5 V

C. 2.9 V

D. 3.0 V

1. In a thermo flask, heat loss by radiation is minimized by the
2. silvered surface
3. vacuum within the double walls
4. plastic stopper
5. cork support
6. Dew point is not affected by

A. temperature

B. wind

C. the amount of water vapour in the atmosphere

D. atmospheric pressure

1. A certain wave has a speed of 20m/s. If the frequency of the wave is 0.25Hz, Calculate the distance between successive crests of the wave

A. 5m

B. 40m

C. 50m

D. 80m

1. The ability of a wave to spread around corners is called

(a) polarization

(b) dispersion

(c) diffraction

(d) reflection.

1. The following devices use plane mirrors in their operations, except

(a) periscope

b) sextant

c) kaleidoscope

d) binoculars.

1. A lens that is thinner at the middle and thicker at the edge is

(a) diverging

(b) converging

(c) Plano-convex

(d) Plano-concave.

1. Which of the following electromagnetic waves has the longest wavelength

(a) radio waves

(b) gamma rays

(c) infra-red waves

(d) ultraviolet rays.

1. A positively charged glass rod is placed the cap of a positively charged electroscope. The divergence of the leaf is observed to

(a) decrease

(b) increase

(c) remain the same

(d) increase and collapse immediately.

1. Capacitors are used in the following devices except

(a) water pumping machine

(b) ceiling fan

(c) electric irons

(d) television sets.

1. A galvanometer of internal resistance 50Ω and a full scale deflection of 20mA is converted into a voltmeter by connecting a resistor of resistance 1950Ω in series with it. Calculate the maximum voltage that can read by the voltammeter.

(a) 20V

(b) 30V

(c) 38V

(d) 40V.

1. Which of the following factors will increase the sensitivity of a moving coil meter?

(a) Strong spring

(b) low number of turns

(c) small area of coil

(d) soft iron core.

1. Which of the following factors does not affect the electric resistance of a wire?

(a) Length

(b) mass

(c) temperature (d) cross sectional area.

1. The resonant frequency of an a.c circuit is 100 KHz. If each of the capacitance and inductance in the circuit is reduced by 50% and no other changes are made, the resonant frequency will become (a) 250 KHz

b) 750 KHz

(c) 1000 KHz

(d) 2000 KHz.

1. Oxidation of the filament in a light bulb is prevented by the introduction of

(a) hydrogen

(b) oxygen

(c) argon

(d) mercury.

1. Eddy currents can be reduced by

(a) laminating the core

(b) winding the coil on a soft iron core

(c) creating holes in the metal plates

(d) using coil of low resistance.

1. . Neutrons are used to induced artificial radioactivity because they

(a) are energetic

(b) have no charge

(c) have no mass

(d) are ionizing.

THEORY

SECTION A: ANSWER ANY FIVE QUESTIONS FROM THIS SECTION

1. State Heisenberg’s uncertainty principle (b) State one phenomenon that can be explained in term of the wave nature of light
2. A ball is projected from the top of a tall building. State the factors on which the distance at which it strikes the ground from the foot of the building depends.
3. In an electrolysis experiment, the ammeter records a steady current of 1A. the mass of copper deposited in 30minutes is 0.66g. calculate the error in the ammeter reading (electrochemical equivalent of copper = 0.00033g/C)
4. Name one use of LASER in each of the following areas (i) communication (ii) medicine (iii) security
5. The ice point of a faulty mercury in glass thermometer is x⁰C while its steam point is 85⁰C. if the thermometer reads 50⁰C when the true temperature is 40⁰C, calculate the value of x
6. What is the work function of a metals? (b) The energy of an ultraviolet light is 5.5 x 10⁹J. calculate its wavelength (c = 3 x 10⁸ m/s, h = 6.6 x 10⁻³⁴ Js)
7. On what principle does lighting in a fluorescent tube operate? (b) state two factors which determine the color of light produced in a fluorescent tube

SECTION B: ANSWER ANY 3 QUESTIONS FROM THIS SECTION

1. Explain radioactivity under the following headings: (i) meaning (ii) types (b) state two(i) advantage of nuclear fusion over nuclear fission (ii) methods of detection of radioactivity (c) An electron of mass 9.1 x 10⁻³¹ kg moves with a speed of 4.8 x 10⁸ m/s in a vacuum. Calculate the wavelength of the associated wave. (h = 6.6 x 10⁻³⁴Js)
2. Define (i) work (ii) energy (b) a pump is used to raise water from a depth of 20m to fill a reservoir of volume 1800m³ in 5 hours. Calculate the power of the pump ( density of water =1000kg/m³ g = 10m/s²) (c)i. what is terminal velocity (ii) Explain the action of a parachute
3. Briefly explain the following terms (i) emission line spectra (ii) line absorption spectra (b) state two (i) reasons to show that x-rays are waves (ii ) uses of x-ray (c) an electron jumps from an energy level of -1.6eV to one of -10.4ev in an atom. Calculate the energy and wavelength of the emitted radiation( h= 6.6 x 10⁻34Js, c= 3 x 10⁸; eV = 1.6 x 10⁻¹⁹)
4. Define radioisotopes (ii) State two uses of radioisotopes (b) State the energy conversion that take place in the production of x-rays in the x-ray tube (ii) Explain how the intensity of x-rays can be increased in an x-ray tube (ii) State two similarities between x-rays and gamma rays (c) An electron excited to an energy level E2 = -2.42 x 10⁻¹⁹J falls to the ground state E0 = 21.8 x 10⁻¹⁹J. Calculate the frequency (ii) wavelength of the emitted photo ( h = 6.6 x 10⁻³⁴Js, c = 3 x 10⁸m/s)
5. What is meant by resonance frequency? (ii) Show the resonance frequency f of an RLC series circuit on a graph variation of current with frequency (b) State three effects of heat on a substance (c) In acertain house, three fans each of 80W, an air-conditioner rated 1500W are operated for 6 hours each day.Seven lamps each rated 40W are switched on for 10 hours each day. The home threatre 100W and television set 80W are also operated each day for 5 hours after which they are kept in standby mode. In the standby mode, the power consumption is 5%of the power rating. Calculate the (i) total energy consumed in the house for 30 days in kWh (ii) cost of operating all the appliances for 30 days at 1 naira per kWh