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Class: 10
Subject: Science
Topic: ASK1510SUPER01
No. of Questions: 60

PHYSICS

Q1.   What will be work done in raising the velocity of a car weight 2000 kg from 15 km/hr to 54 km/hr.
(a) $2.5 \times 10^5 J$
(b) $2.25 \times 10^5 J$
(c) $2.0 \times 10^5 J$
(d) $1.5 \times 10^5 J$

Sol.   (c)
$W = \Delta KE$
$V_i = \frac{18 \times 5}{18} = 5 \, m/s$
$= \frac{1}{2} mv_f^2 - \frac{1}{2} mv_i^2$
$= V_f = \frac{54 \times 5}{18} = 15 \, m/s$
$= \frac{1}{2} \times 2000 \, [15^2 - 5^2]$
$= 2 \times 10^5 \, J$

Q2.   Two cars of unequal masses use similar tyres. If they are moving with same initial speed the minimum stopping distance
(a) Is smaller for the heavier car
(b) Is smaller for the lighter car
(c) Is same for both the car
(d) Depends on the volume of the car

Sol.   (c)
(-)ve acceleration for both the cars is equal since μ is same.

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Q3.   The kinetic energy of an object is k. If its velocity is doubled, then its kinetic energy will be ….
       (a) K
       (b) 2K
       (c) 4K
       (d) K/4

Sol.   (c)

Q4.   Frequency of Ultrasonic waves is ……
       (a) Less than 20,000 Hz.
       (b) Greater than 20, 0000 Hz.
       (c) Less than 20 Hz
       (d) 1000 Hz.

Sol.   (b)

Q5.   A balloon which is ascending at the rate of 12/s is 30.4 metre above the ground, when a stone is dropped. After what time the stone will reach the ground?
       (a) 3 sec.
       (b) 3.5 sec.
       (c) 4 sec.
       (d) 6 sec.

Sol.   (c)
$$-30.4 = 12t - \frac{1}{2}(9.8)t^2$$
$$4.9t^2 - 12t - 30.4 = 0$$
$$t = 4s$$

Q6.   A pandubbai sends a sonar signal to locate a body and receivers the echo after 5s. if the velocity sound is 340 m/s. What is the distance of the body?
       (a) 0.85 km
       (b) 1.7 km
       (c) 0.425 km
       (d) 4.25 km

Sol.   (a)
$$d = \frac{vt}{2} = \frac{340 \times 5}{2} = 850\ m = 0.85\ km.$$

Q7. Which of the following quantities remain constant in a planetary motion (consider elliptical orbits) as seen from the sun?

(a) Speed

(b) Angular velocity

(c) Kinetic energy

(d) Angular momentum

Sol. (d)

Q8. The far point of a myopic person is 100 cm in front of him. What is the power of the lens to correct the problem of his eye?

(a) – 1.0 D

(b) + 1.0 D

(c) -1.25 D

(d) + 1.25 D

Sol. (a)

Lens should a virtual image of a distance object at 100 cm from the lens. Thus it should be a divergent lens and its focal length = - 100 cm

$\therefore \ P = \frac{1}{f} = \frac{1}{-1} = 1D$

Q9. A vessel is 2 meter deep. How deep will it appear if it is filled with water and viewed from above?

(a) 2 m

(b) 3 m

(c) 3/2 m

(d) 4/3 m

Sol. (c)

Apparent depth $= \frac{D}{\mu} = \frac{2}{1.33} = \frac{1}{4/3} = \frac{3}{2} \ m$

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Q10. An electron enters in a magnetic field at right angle to it as shown in figure. The direction of force acting on the electron will be
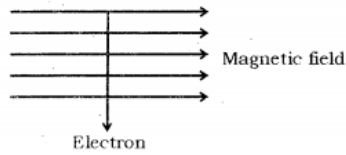
(a) To the left
(b) To the right
(c) Out of the page
(d) Into the page

Sol. (d)

Q11. A certain household has consumed 200 units of energy during a month. Its value in joules will be
(a) 3.6×10^{10}
(b) 7.2×10^{10}
(c) 3.6×10^{8}
(d) 7.2×10^{8}

Sol. (d)

Q12. Characteristics of good source of energy are that
(a) Disintegration distillation
(b) Compound distillation
(c) Destructive distillation
(d) Fractional distillation

Sol. (d)
Characteristics of good sources of energy are : Good calorific value, easily accessible and economical, easy to store and transport.

Q13. The Sun's energy is due to
(a) The nuclear fission of hydrogen
(b) The nuclear fusion of hydrogen
(c) The natural combustion of hydrogen
(d) The nuclear fission of uranium

Sol. (b)

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Q14. In order to find the direction of induced current one uses
   (a) Fleming's left – hand rule
   (b) Fleming's right – hand rule
   (c) Right – hand thumb rule
   (d) Screw rule

Sol.   (b)

Q15. A student did the experiment to find the equivalent resistance of two given resistor R_1 & R_2. First when they are connected in series and next when they are connected in parallel. The two values of the equivalent resistance obtained by him R_S and R_P respectively. He would find that:
   (a) $R_s < R_p$
   (b) $R_s > R_P$
   (c) $R_s = R_p = \left(\frac{R_1 + R_2}{2}\right)$
   (d) $R_s = R_p$ but not equal to $\left(\frac{R_1 + R_2}{2}\right)$

Sol.   (b)

Q16.   Column – I   Column – II
        (Position of the object)   (Position of the image formed by a concave mirror)
        (1) At infinity   (p) Real, inverted , same size
        (2) Beyond 2 F   (q) Real, inverted, highly enlarged
        (3) At 2F   (r) Real, inverted, highly enlarged
        (4) Between F and 2F   (s) Real, inverted, diminished
        (5) At focus F   (t) Virtual , erect, enlarged
        (6) Between F and O   (u) Real, inverted, enlarged

   (a) $(1) - (r); (2) - (s); (3) - (p); (4) - (u); (5) - (q); (6) - (t)$
   (b) $(1) - (s); (2) - (r); (3) - (p); (4) - (u); (5) - (q); (6) - (t)$
   (c) $(1) - (r); (2) - (s); (3) - (u); (4) - (p); (5) - (q); (6) - (t)$
   (d) $(1) - (r); (2) - (s); (3) - (p); (4) - (u); (5) - (t); (6) - (q)$

Sol.   (c)

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Q17.   A wave on string has a frequency of 440 Hz an a wavelength of 1.3 m. How fast does the wave travel?
(a) 270 m/s
(b) 470 lm/s
(c) 520 m/s
(d) 570 m/s

Sol.   (d)
$$v = \lambda f = (1.3\ m)(440\ Hz) = 570\ m/s$$

Q18.   Potential energy of your body is minimum when
(a) You are standing
(b) You are sitting on a chair
(c) You are sitting on the ground
(d) You lie down on the ground

Sol.   (d)

Q19.   Consider the following statements:
(1) The acceleration due to gravity of moon is equal to that of the earth.
(2) The value of G is independent of the nature, size and mass of the interacting bodies
(a) (1) only
(b) (2) only
(c) Both (1) and (2)
(d) Neither (1) nor (2)

Sol.   (d)

Q20.   A train travels 40 km at a uniform speed of 30 km h^{-1}. Its average speed after traveling another 40 km is 45 km h^{-1} for the whole journey. Its speed in the second half of the journey is
(a)   45 km h^{-1}
(b) 90 km h^{-1}
(c) 60 km h^{-1}
(d) None of these

Sol.   (b)
Let speed of the train in later half = x, then the time taken to travel later 40 km = 40/x hours
Total time take = 40/30 + 40/x

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Average speed = $\frac{80}{\frac{4}{3}+40x} = 45$

Solve the equation to find value of   x

CHEMSITRY

Q21.   Ice is floating on water in a beaker when ice completely melts then level of water in beaker:
(a) Increase
(b) Decrease
(c) Remains the same
(d) First increases then decreases

Sol.   (c)
Level of water remains constant as ice is less dense than liquid water. In ice, the water molecules are packed in cage structure. If it melts some of the water is free to move in between the free room in the crystalline cage structure.

Q22.   Which one of the following is not a base?
(a) $B\ (OH)_3$
(b) KOH
(c) $Ca(OH)_2$
(d) NH_4OH

Sol.   (a)
$B\ (OH)_3\ is\ boric\ acid$
Also referred as H_3BO_3

Q23.   A sample of MgCO$_3$ contains $3.01 \times 10^{23}\ Mg^{2+}\ ions\ and\ 3.01 \times 10^{23}\ CO_3^{2-}\ ions.$ The mass of the sample is
(a) 42 mg
(b) 84 g
(c) 0.42 kg
(d) 42 mol

Sol.   (c)
Sample contains $3.01 \times 10^{23}\ MgCO_3$ molecules.

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Therefore, 6.022×10^{23} molecules weigth $84\ gms$

$$\Rightarrow \quad 3.01 \times 10^{23}\ molecules\ weight\ = \frac{84}{2}\ gms$$

$$= 42\ gms$$

$$= 0.42\ kg$$

Q24.   Which of the following may be isomer of aldehyde having general formula? $C_n\ H_{2n}O$?

(a) Alcohol

(b) Ether

(c) Ester

(d) Ketone

Sol.   (d)

Aldehydes and ketones are functional isomers of each other belonging to family of carbonyl compounds with general molecular formula $C_nH_{2n}\ O$.

Q25.   Which of the following has the greatest concentration of H^+ - ion?

(a) 1 mol L^{-1} HCl solution

(b) 1 mol L^{-1} H_3PO_2 solution

(c) 1 mol L^{-1} H_2SO_4 solution

(d) 1 mol L^{-1} $H_2\ CO_3$ solution

Sol.   (c)

Concentration of all the solution is equal. Therefore, due to double dissociation of H_2SO_4 it will give greatest concentration of H^+ ion. On the other hand, H_2CO_3 being weak acid will dissociate partially.

Q26.   Which of the following solution has the lowest pH value?

(a) 0.1 Molar NaCl solution

(b) 0.01 Molar $NaHCO_3$

(c) 0.001 Molar Na_2CO_3 solution

(d) 0.01 Molar NaOH solution

Sol.   (a)

Other solution will result in pH greater than 7. Nacl solution - neutral.

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Q27. The bond, in compound formed from combination of 14 group and 17 group elements of Periodic table will be ......
(a) Electrovalent bond
(b) Co – ordinate bond
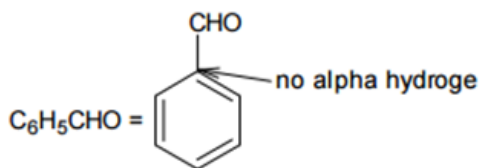(c) Van der Waals bond
(d) Covalent bond

Sol. (d)

Q28. When Sodium carbonate (Na_2CO_3) reacts with Silica (SiO_2) gives .....
(a) Soda glass
(b) Water glass
(c) Crook's glass
(d) Pyrex glass

Sol. (b)

Q29. Which of the following aldehyde undergo cannizzaro reaction ?
(a) C_3H_7CHO
(b) C_6H_5CHO
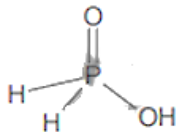(c) CH_3CHO
(d) CH_3CH_2CHO

Sol. (b)
Aldehydes lacking hydrogen atom in the alpha position involve in "cannizzaro reaction".

Q30. Which of the following oxyacid of phosphorus are monobasic (monocratic)?
(a) H_3PO_4
(b) H_3PO_3
(c) H_3PO_2
(d) $H_4P_2O_7$

Sol. (c)

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H_3PO_2 is a monobasic acid due to it has only one replaceable hydrogen.

Q31. Acidified KMnO₄ is decolorized by
    (a) Ferric ammonium alum
    (b) Mortar salt
    (c) Haematite
    (d) A netural ferric chloride solution

Sol. (b)
It's Mohr's Salt
$(NH_4)_2\ Fe(SO_4)_2 \ . \ 6H_2O$
$MnO_4^- + Fe^{+2} \ \xrightarrow{H^+} \ Mn^{+2} + Fe^{+3}$
Ammonium iron(ii) sulphate decolorizes KMnO₄

Q32. How many Faradays are required to reduce 1 mole of BrO₂ to Br⁻?
    (a) 3
    (b) 4
    (c) 5
    (d) 6

Sol. (b)

Q33. Two substances, A and B were made to react to form a third substance, A₂B according to the following reaction
Which of the following statements concerning this reaction are incorrect?
    (i)   The product A₂B shows the properties of substances A and B
    (ii)   The product will always have a fixed composition
    (iii)   The product so formed cannot be classified as a compound
    (iv)   The product so formed is an element
    (a) (i) , (ii) and (iii)
    (b) (ii) , (iii) and (iv)

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(c) (i), (iii) and (iv)

(d) (iii) and (iv)

Sol. (c)

Q34. In the Thomson's model of atom, which of the following statements are correct?

(i) The mass of the atom is assumed to be uniformity distributed over the atom

(ii) The positive charge is assumed to be uniformity distributed over the atom

(iii) The electrons are uniformly distributed in the positively charged sphere

(iv) The electrons attract each other to stabilize the atom

(a) (i), (ii) and (iii)

(b) (i) and (iii)

(c) (i) and (iv)

(d) (i), (iii) and (iv)

Sol. (a)

Q35. Which of the following reaction is based on activity series of metals?

(a) Decomposition reaction

(b) Displacement reaction

(c) Double displacement reaction

(d) Synthesis reaction

Sol. (b)

Q36. pH of human body varies within the range of

(a) 6.0 to 6.5

(b) 5.5 to 5.8

(c) 7.0 to 7.8

(d) 7.0 to 11.0

Sol. (c)

Q37. Select the one that could displace copper from a solution of copper sulphate.
(a) Silver
(b) Mercury
(c) Tin
(d) Gold

Sol. (c)

Q38. Cyclohexane, a hydrocarbon, floats on water because
(a) It is immiscible with water
(b) Its density is low as compared to water
(c) It is non – polar substances
(d) It is immiscible and lighter than water

Sol. (d)

Q39. An element 'M' has an atomic number 9 and its atomic mass 19. The ion of M will be represented by
(a) M
(b) M^{2+}
(c) M^{-}
(d) M^{2-}

Sol. (c)
The electronic configuration of M is 2, 7. It needs one electrons to complete its octet. It has a strong tendency to gain 1 electron and so it its ion will be M^{-}

Q40. Natural indicator litmus is extracted from
(a) Lichens
(b) Earthworms
(c) Ants (4)
(d) Algae

Sol. (a)
Natural indicator is obtained from lichens and is purple in colour. It turns acidic solution red and basic solution blue.

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BIOLOGY

Q41.   The site of photosynthesis in plant is
(a) Mitochondria
(b) Chloroplast
(c) Leucoplast
(d) Dictysosomes

Sol.   (b)

Q42.   The important components of DNA molecule are A (Adenine), T (Thymine), G (Guanine) and C(Cytosine). According to Chargaff's rule, their amount in DNA molecule is
(a) The amount of A & T is equal to that of C & G
(b) The amount of A & G is equal to that of T & C
(c) A, T, C & G are all in equal amount
(d) None of these

Sol.   (b)

Q43.   WBC and RBC are found in human blood in the ratio of
(a) 1 : 60
(b) 1 : 600
(c) 1 : 6000
(d) 1 : 60, 000

Sol.   (b)

Q44.   Which of the following diseases is not caused by polluted water?
(a) Typhoid
(b) Dysentery
(c) Malaria
(d) Jaundice

Sol.   (c)

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Q45. Cement factory labourers are prone to
(a) Leukemia
(b) Bone – marrow diseases
(c) Asbestosis
(d) Cytosilicosis

Sol.   (d)

Q46. The most important function of inflorescence is to help in
(a) Dispersal of seeds
(b) Help in fertilization
(c) Attracting insects for pollination
(d) Forming large number of fruits

Sol.   (c)

Q47. In Xerophytes, the rate of water loss get reduced due to covering of epidemis by:
(a) Cutin
(b) Suberin
(c) Lignin
(d) Gum

Sol.   (a)
Cutin, a waxy layer prevents transpiration from aerial parts of xerophytes.

Q48. Given below are the pairs of diseases and causal pathogen. Which one of these is not a matching pair?
(a) Kala azar – Leishmania
(b) Sleeping sickness – Trypanossoma
(c) Malaria – Salmonella
(d) Acne – Staphylococci

Sol.   (c)
Malaria is caused by Plasmodium sp.

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Q49. During lack of oxygen in tissues of our body, the pyruvate is converted into lactic acid in:
(a) Mitochondria
(b) Nucleus
(c) Cytoplasm
(d) Ribosome

Sol. (c)
Due to lack of oxygen, pyruvate does not enter the kreb's cycle and gets converted into lactic acid in the cytoplasm.

Q50. Kidneys do not perform the function of
(a) Regulation of blood pressure
(b) Filtration of blood
(c) Regulation of ions concentration
(d) Secretion of anti-bodies

Sol. (d)
Kidneys are not involved in secretion of antibodies.

Q51. Phototropic and geotropic response of a plant is under control of following hormone:
(a) Auxin
(b) Gibberlin
(c) Cytokinin
(d) Ethylene

Sol. (a)
Phototrophic and geotropic movements of a plants depend upon different concentration of auxim.

Q52. Double fertilization is a unique feature of :
(a) Bryophytes
(b) Angiosperm
(c) Algae
(d) Gymnosperm

Sol. (b)
Double fertilization is a characteristic of Angiosperms (flowering plants) in which zygote and endosperm nucleus are formed.

Q53. Which set clearly, identify striated muscles?

    (a) Cylinderical, syncytial and unbranched

    (b) Spindle, unbranched and uninucleated

    (c) Cylindrical, striped and branched

    (d) Cylindrical, striped and branched

Sol. (a)

Q54. Which of the following is an edible "Fungi"?

    (a) Mucor

    (b) Penicillium

    (c) Agaricus

    (d) Rhizopus

Sol. (c)

Q55. Largest heart is found in

    (a) Elephant

    (b) Giraffe

    (c) Crocodile

    (d) Lion

Sol. (a)

Q56. New species may be formed if

    (i) DNA undergoes significant changes in germ cells

    (ii) Chromosome number changes in the gamete

    (iii) There is no change in the genetic material

    (iv) Mating does not take place

    (a) (i) and (ii)

    (b) (i) and (iii)

    (c) (ii), (iii) and (iv)

    (d) (i), (ii) and (iii)

Sol. (a)

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Q57.   Preservation of the Ozone layer
        (a) Is important because it helps in stopping harmful UV radiations
        (b) Is endangered by CFCs
        (c) Both (1) and (2)
        (d) Ozone is formed at the higher levels of the atmosphere.

Sol.   (c)
        Ozone layer helps in stopping harmful UV radiations from the Sun to enter the earth's atmosphere. Excess amount of chlorofluorocarbons (usually from refrigeration appliances) in the atmosphere is found to endanger the ozone layer.

Q58.   Wide range of categories of classification f organisms causing infectious diseases include
        (a) Single called organisms like protozoon
        (b) Very small microbes like virus
        (c) Multi cellular organisms such as worms
        (d) All of these

Sol.   (b)
        Inflammation is the process of recruiting many cells to the affected tissue to kill off the disease causing microbes.

Q59.   Lichens while growing on the surface of rocks release certain substances.
        (a) That erodes the rock surface to power
        (b) That enters into the cracks
        (c) That grows into more organisms
        (d) None of these
Sol.   (a)
        Lichens while growing on the surface of rocks release certain substances that erode the rock surface to power.

Q60.   Which of the following are exotic breeds?
        (i)   Brawn
        (ii)   Jersy
        (iii)   Brown Swiss
        (iv)   Jersy Swiss
        (a) (i) and (iii)
        (b) (ii) and (iii)
        (c) (i) and (iv)

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(d) (ii) and (iv)

Sol.   (b)