SECTION – 1 (PHYSICS)

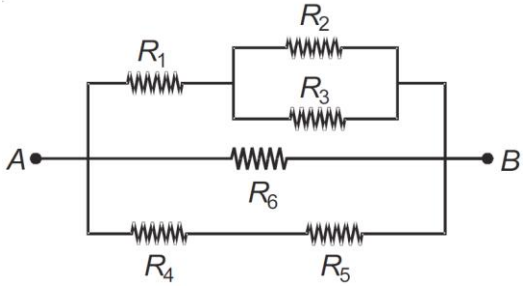
1. A convex mirror is used to form an image of a real object. Then mark the wrong statement
   (1) The image lies between the pole and focus (2) The image is diminished in size
   (3) The image is erect (4) The image is real

2. A concave mirror of focal length f produces an image n times the size of the object. If the image is real then the distance of the object from the mirror is
   (1) $(n-1)f$ (2) $\left\{\frac{(n-1)}{n}\right\}f$ (3) $\left\{\frac{(n+1)}{n}\right\}f$ (4) $(n+1)f$

3. A convex mirror has a focal length f. A real object is placed at a distance f in front of it, from the pole. It produces an image at
   (1) Infinity (2) f (3) f/2 (4) 2f

4. An object placed in front of a concave mirror of focal length 0.15 m produces a virtual image, which is twice the size of the object. The position of the object with respect to the mirror is
   (1) –5.5 cm (2) –6.5 cm (3) –7.5 cm (4) –8.5 cm

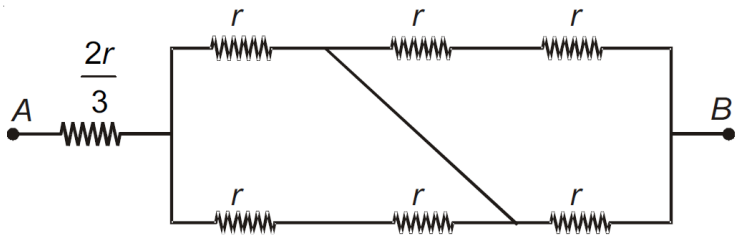
5. Consider the combination of resistors as shown in figure and pick out the correct statement



   (1) R_1 & R_4 are connected in parallel (2) R_1 & R_2 are connected in series
   (3) R_2 & R_3 are connected in parallel (4) R_6 & R_4 are connected in parallel

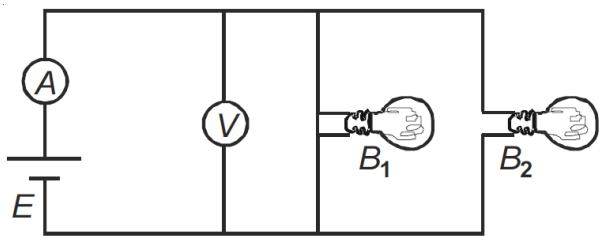
6. Select the correct statement
   (1) Electric current is a vector quantity
   (2) Resistivity of a conductor decreases with increase in temperature
   (3) Resistance is the opposition to the flow of current
   (4) Current density is a scalar quantity

7. The effective resistance of the network between points A & B is



   (1) r (2) 2r (3) $\frac{4r}{3}$ (4) $\frac{7r}{3}$

8. Two identical bulbs are connected in parallel across an ideal source of emf E. The ammeter A and voltmeter V are ideal. If bulb B_2 gets fused, then



(1) Reading of A will increase but that of V will remain same
(2) Reading of A will decrease but that of V will increase
(3) Reading of A will decrease but that of V will remain same
(4) Reading of A will increase and reading of V will also increase

9. A certain piece of copper is to be shaped into a conductor of minimum resistance. Its length and diameter should respectively be

(1) L, D (2) $2L, \frac{D}{2}$ (3) $\frac{L}{2}, 2D$ (4) $L, \frac{D}{2}$

10. A wire of resistance x ohm is drawn out, so that its length is increased to twice its original length, and its new resistance becomes $20\ \Omega$, then x will be

(1) 5Ω (2) 10Ω (3) 15Ω (4) 20Ω

11. A wire has resistance 12 ohm. It is bent in the form of a circle. The effective resistance between the two points on any diameter of the circle is

(1) 12Ω (2) 24Ω (3) 3Ω (4) 6Ω

12. A compass needle which is allowed to move in a horizontal plane is taken to a geomagnetic pole. It
(1) Will stay in north-south direction only
(2) Will stay in east-west direction only
(3) Will become rigid showing no movement
(4) Will stay in any position

13. Due to earth's magnetic field, the charged cosmic rays particles
(1) Can never reach the pole
(2) Can never reach the equator
(3) Require greater kinetic energy to reach the equator than pole
(4) Require less kinetic energy to reach the equator than pole

14. There are four light-weight-rod samples, A, B, C, D separately suspended by threads. A bar magnet is slowly brought near each sample and the following observations are noted
(i) A is feebly repelled
(ii) B is feebly attracted
(iii) C is strongly attracted
(iv) D remains unaffected
Which one of the following is true?
(1) A is of a non-magnetic material (2) B is of a paramagnetic material
(3) C is of a diamagnetic material (4) D is of a ferromagnetic material

15. For protecting a sensitive equipment from the external magnetic field, it should be
(1) Surrounded with fine copper sheet
(2) Placed inside an iron can
(3) Wrapped with insulation around it when passing current through it
(4) Placed inside an aluminium can

16. If a diamagnetic substance is brought near north or south pole of a bar magnet, it is
(1) Repelled by north pole and attracted by the south pole
(2) Repelled by the poles
(3) Attracted by the poles
(4) Attracted by the north pole and repelled by the south pole

17. A car moves with speed 60 km/h for 1 hour in east direction and with same speed for 30 min in south direction. The displacement of car from initial position is
(1) 60 km (2) $30\sqrt{3}$km (3) $30\sqrt{5}$km (4) $60\sqrt{2}$km

18. A boat covers certain distance between two spots in a river taking t_1 hrs going downstream and t_2 hrs going upstream. What time will be taken by boat to cover same distance in still water?
(1) $\frac{t_1+t_2}{2}$ (2) $2(t_1-t_1)$ (3) $\frac{2t_1t_2}{t_1+t_2}$ (4) $\sqrt{t_1t_2}$

19. A body is projected vertically upward direction from the surface of earth. If upward direction is taken as positive, then acceleration of body during its upward and downward journey are respectively
(1) Positive, negative (2) Negative, negative
(3) Positive, positive (4) Negative, positive

20. A car travelling at a speed of 30 km/h is brought to rest in a distance of 8 m by applying brakes. If the same car is moving at a speed of 60 km/h then it can be brought to rest with same brakes in
(1) 64 m (2) 32 m (3) 16 m (4) 4 m

21. From Newton's second law of motion, it can be inferred that
(1) No force is required to move a body uniformly along straight line
(2) Accelerated motion is always due to an external force
(3) Inertial mass of a body is equal to force required per unit acceleration in the body
(4) All of these

22. If a force of constant magnitude acts in direction perpendicular to the motion of a particle, then its
(1) Speed is uniform (2) Momentum is uniform
(3) Velocity is uniform (4) All of these

23. A body of mass 2 kg is sliding with a constant velocity of 4 m/s on a frictionless horizontal table. The force required to keep the body moving with the same velocity is
(1) 8 N (2) 0 N (3) 2×10^4 N (4) $\frac{1}{2}$ N

24. A block of mass m is released on a smooth inclined plane of inclination θ with the horizontal. The force exerted by the plane on the block has a magnitude

(1) mg (2) $\frac{mg}{\cos\theta}$ (3) $mg\tan\theta$ (4) $mg\cos\theta$

25. A weight Mg is suspended from the middle of a rope whose ends are at the same level. The rope is no longer horizontal. The minimum tension required to completely straighten the rope is

(1) $\frac{Mg}{2}$ (2) $Mg\cos\theta$ (3) $2Mg\cos\theta$ (4) Infinitely large

SECTION – 2 (CHEMISTRY)

26. Mole fraction of A in H_2O is 0.2. The molality of A in H_2O is :

(1) 13.9 (2) 15.5 (3) 14.5 (4) 16.8

27. What is the molarity of H_2SO_4 solution that has a density of 1.84 g/cc and contains 98% by mass of H_2SO_4 ? (Given atomic mass of S = 32)

(1) 4.18 M (2) 8.14 M (3) 18.4 M (4) 18 M

28. The molality of a sulphuric acid solution is 0.2. Calculate the total weight of the solution having 1000gm of solvent.

(1) 1000g (2) 1098.6g (3) 980.4g (4) 1019.6g

29. In a certain electronic transition in the hydrogen atom from an initial state I to a final state f, the difference in the orbit radius $(r_f - r_i)$ is seven times the Bohr radius. Identify the transition.

(1) $4 \to 1$ (2) $4 \to 2$ (3) $4 \to 3$ (4) $3 \to 1$

30. The velocity of electron in the ground state of H atom is $2.185\times10^8 cm/sec.$ The velocity of electron in the second orbit of Li^{2+} ion in cm/sec would be

(1) 3.276×10^8 (2) 2.185×10^8 (3) 4.91×10^8 (4) 1.638×10^8

31. In which of the following the energy change corresponds to first ionization potential :-

(1) $X_{(g)} \to X^+_{(g)} + e$ (2) $2X_{(g)} \to 2X^+_{(g)} + 2e$

(3) $X_{(s)} \to X^+_{(g)} + e$ (4) $X_{(aq)} \to X^+_{(aq)} + e$

32. In the ions P^{3-}, S^{2-} and Cl^- the increasing order of size is :-

(1) Cl^-, S^{2-}, P^{3-} (2) P^{3-}, S^{2-}, Cl^- (3) S^{2-}, Cl^-, P^{3-} (4) S^{2-}, P^{3-}, Cl^-

33. The bond order of CO molecule on the basis of molecular orbital theory is

(1) Zero (2) 2 (3) 3 (4) 1

34. Which of the following pairs of species have unpaired electrons in antibonding molecular orbitals:

(1) C_2, O_2 (2) O_2, He_2^+ (3) He_2^+,C_2 (4) N_2, O_2^-

35. The correct set of carbonate ores is :-

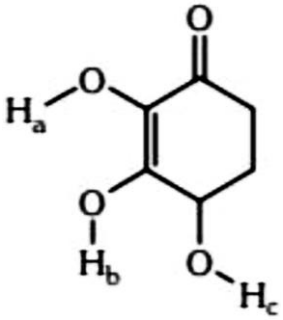
(a) Magnesite (b) Siderite (c) Zincite (d) Argentite

(1) a, b (2) a, d (3) c, d (4) b, c

36. Calcination is the process of heating the ore:-
(1) in inert gas (2) in the presence of air
(3) in the absence air (4) in the presence of CaO and MgO

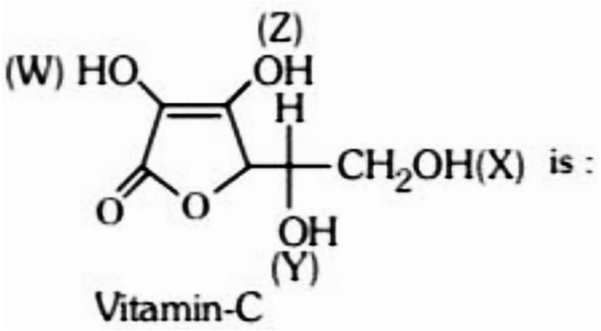
37. Matte :-
(1) $Cu_2S + FeS$ (2) $Cu_2O + FeS$ (3) $Cu_2O + Cu_2S$ (4) $FeS + SiO_2$

38. Use resonance arguments to rank the following in order of increasing acidic strength.



(1) $H_c < H_a < H_b$ (2) $H_b < H_a < H_c$ (3) $H_b < H_c < H_a$ (4) $H_c < H_b < H_a$

39. The most acidic 'H'



(1) X (2) Y (3) Z (4) W

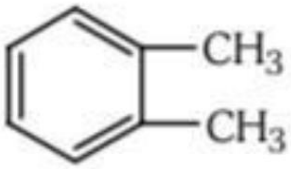
40. Which of the following shows the correct order of decreasing basicity in aqueous medium ?
(1) $(CH_3)_3N > (CH_3)_2 NH > CH_3NH_2 > NH_3$
(2) $(CH_3)_2NH > (CH_3)_3N > CH_3NH_2 > NH_3$
(3) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N > NH_3$
(4) $(CH_3)_2NH > CH_3NH_2 > NH_3 > (CH_3)_3N$

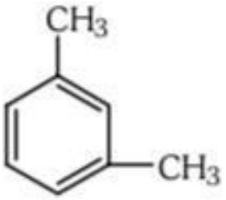
41. The molar conductance of $AgNO_3$, AgCl and NaCl at infinite dilution are 116.5, 121.6 and 110.3 $cm^3\ mol^{-1}$ respectively. The molar conductance of $NaNO_3$ is :
(1) 111.4 S $cm^2\ mol^{-1}$ (2) 105.2 S $cm^2\ mol^{-1}$
(3) 130.6 S $cm^2\ mol^{-1}$ (4) 150.2 S $cm^2\ mol^{-1}$

42. The conductivity of a saturated solution of $BaSO_4$ is 3.06×10^{-6} $ohm^{-1}\ cm^{-1}$ and its molar conductance is 1.53 $ohm^{-1}\ cm^2\ mol^{-1}$. The K_{sp} of $BaSO_4$ will be
(1) 4×10^{-12} (2) 2.5×10^{-9} (3) 2.5×10^{-13} (4) 4×10^{-6}

43. Kohlrausch's law states that at :-
(1) Infinite dilution, each ion makes definite contribution to conductance of an electrolyte whatever be the nature of the other ion of the electrolyte.
(2) Infinite dilution, each ion makes definite contribution to equivalent conductance of an electrolyte whatever be the nature of the other ion of the electrolyte.
(3) Finite dilution, each ion makes definite contribution to equivalent conductance of an electrolyte whatever be the nature of the other ion of the electrolyte.
(4) Infinite dilution, each ion makes definite contribution to equivalent conductance of an electrolyte depending on the nature of the other ion of the electrolyte

44. Ring nitration of dimenthyl benzene results in the formation of only one nitro dimethyl benzene. The dimethyl benzene is:

(1) 

(2) 

(3) 

(4) None of these

45. An aromatic compound of molecular formula C_6H_4Br was nitrated then only product of formula $C_6H_3Br_2NO_2$ were obtained. The original compound is:
(1) o-dibromobenzene (2) m-dibromobenzene
(3) p-dibromobenzene (4) Both 1 and 3

46. Which of the following is/are produced when a mixture of benzene vapour and oxygen is passed over V_2O_5 catalyst at 775 K?
(1) Oxalic acid (2) Glyoxal (3) Fumaric acid (4) Maleic anhydride

47. Methyl group attached to benezene can be oxidised to carboxylic group by reacting with:
(1) Fe_2O_3 (2) $AgNO_3$ (3) $KMnO_4$ (4) CrO_3

48. For $NH_4HS(s) \rightleftharpoons NH_3(g) + H_2S(g)$, if $K_p = 64 atm^2$, equilibrium pressure of mixture is :
(1) 8 atm (2) 4 atm (3) 64 atm (4) 16 atm

49. Which of the following expressions is not true ?
(1) $[H^+] = [OH^-] = \sqrt{K_w}$ for a neutral solution at all temperatures
(2) $[H^+] > \sqrt{K_w}$ & $[OH^-] < \sqrt{K_w}$ for an acidic solution
(3) $[H^+] < \sqrt{K_w}$ & $[OH^-] > \sqrt{K_w}$ for an alkaline solution
(4) $[H^+] = [OH^-] = 10^{-7} M$ for a neutral solution at all temperatures.

50. pOH of H_2O is 7.0 at 298 K. If water is heated at 350 K, which of the following should be true?
(1) pOH will decrease
(2) pOH will increase
(3) pOH will remain 7.0
(4) concentration of H+ ions will increase but that of OH^- will decrease

SECTION – 3 (BIOLOGY)

51. _____is regarded as a unit of nervous system.
(1) Axon (2) Dendrite (3) Myelin sheath (4) Neuron

52. Interferons are synthesized in response to _____.
(1) bacteria (2) fungi (3) protozoans (4) viruses

53. _____is not a vestigeal organ in man.
(1) Coccyx (2) Nail
(3) Third molar (4) Segmental muscles of abdomen

54. _____ is the best material for the study of mitosis in the laboratory.
(1) Root tip (2) Leaf tip (3) Anther (4) Ovary

55. The middle piece of sperm contains _____.
(1) nucleus (2) centriole (3) mitochondria (4) ribosome

56. If a colour blind woman marries a normal visioned man, their sons will be _____.
(1) all colourblind
(2) all normal visioned
(3) one – half colourblind and one-half normal
(4) three – four this colourblind and one-fourth normal

57. Common cold is not cured by antibiotics as it is_____.
(1) caused by a virus (2) caused by a fungus
(3) not an infectious disease (4) caused by a bacterium

58. Which one of the following does not act as a neurotransmitter?
(1) Cortisone (2) Epinephrine (3) Norepinephrine (4) Acetylcholine

59. _____is often called “the graveyard of RBCs”.
(1) Kidney (2) Liver (3) Spleen (4) Gall bladder

60. The ovule of an angiosperm is technically equivalent to _____.
(1) megaspore (2) megaspore mother cell
(3) megasporangium (4) megasporophyll

61. The similarities in organisms with different genotypes indicate _____evolution
(1) convergent (2) divergent (3) micro (4) macro

62. The tablets to prevent contraception contain _____.
(1) FSH (2) LH (3) both (1) and (2) (4) progesterone

63. Immunoglobulin _____constitutes the largest percentage in human milk.
(1) G (2) A (3) M (4) D

64. A person with blood group AB is considered as universal recipient because he/she has _____.
(1) no antigen on RBC and no antibody in the plasma
(2) both A and B antibodies in the plasma
(3) both A and B antigens in the plasma but no antibodies
(4) both A and B antigens on RBC but no antibodies in the plasma

65. Which of the following absorb light energy for photosynthesis ?
(1) Oxygen (2) RuBisCO enzyme
(3) Water (4) Chlorophyll

66. _____ is responsible for fruit ripening.
(1) Auxin (2) Cytokinin (3) ABA (4) Ethylene

67. The bacterium *Salmonella* is related with _____.
(1) TB (2) AIDS (3) Typhoid (4) Malaria

68. Industrial melauism is an example of _____.
(1) drug resistance
(2) defensive adaptation of skin against UV radiations
(3) darkening of skin due to smoke from industries
(4) protective resemblance with the surroundings

69. How many pairs of contrasting characters in *Pisum sativum* were studied by Mendel in his experiments?
(1) 2 (2) 4 (3) 7 (4) 14

70. During cell growth, DNA synthesis takes place in the_____phase.
(1) M (2) S (3) G_1 (4) G_2

71. _____ is the shared terminal duct of the reproductive system and urinary system in the human male.
(1) Ureter (2) Vas deferens (3) Urethra (4) Vas efferentia

72. _____is a temporary endocrine gland in the human body.
(1) Corpus allatum (2) Corpus cardiacum
(3) Corpus luteum (4) Pineal gland

73. In soil, the water available for plants is _____ water.
(1) hygroscopic (2) capillary (3) chemically bound (4) gravitational

74. The aerobic respiratory pathway is appropriately termed _____.
(1) anabolic (2) amphibolic (3) catabolic (4) parabolic

75. Uricotelic mode of passing out nitrogenous wastes is found in _____
(1) amphibians and reptiles (2) insects and amphibians
(3) reptiles and birds (4) birds and annelids

ANSWER KEY ACE OF PACE CLASS 10th MEDICAL

PHYSICS

1.	(4)	2.	(3)	3.	(3)	4.	(3)	5.	(3)
6.	(3)	7.	(2)	8.	(3)	9.	(3)	10.	(1)
11.	(3)	12.	(4)	13.	(2)	14.	(2)	15.	(2)
16.	(2)	17.	(3)	18.	(3)	19.	(2)	20.	(2)
21.	(4)	22.	(1)	23.	(2)	24.	(4)	25.	(4)

CHEMISTRY

26.	(1)	27.	(3)	28.	(4)	29.	(3)	30.	(1)
31.	(1)	32.	(1)	33.	(3)	34.	(2)	35.	(1)
36.	(3)	37.	(1)	38.	(1)	39.	(3)	40.	(3)
41.	(2)	42.	(4)	43.	(2)	44.	(3)	45.	(3)
46.	(4)	47.	(3)	48.	(4)	49.	(4)	50.	(1)

BIOLOGY

51.	(4)	52.	(4)	53.	(2)	54.	(1)	55.	(3)
56.	(1)	57.	(1)	58.	(1)	59.	(3)	60.	(3)
61.	(1)	62.	(3)	63.	(2)	64.	(1)	65.	(4)
66.	(4)	67.	(3)	68.	(4)	69.	(3)	70.	(2)
71.	(3)	72.	(3)	73.	(2)	74.	(2)	75.	(3)

ACE OF PACE (SOLUTION)

1. (4)

A convex mirror always forms a virtual image in the care of a real object.
In care of a virtual object reflected rays may intersect really to make a real image.

2. (3)

$$(\text{magnification})m = \frac{f}{f-u}$$

Focal real image m = –n

$$-n = \frac{-f}{-f-u}$$

$$\Rightarrow u = -\frac{f(n+1)}{u}$$

3. (3)

$$\text{Mirror formula}: \frac{1}{v}+\frac{1}{u}=\frac{1}{f}$$

Here object is real so u is negative

$$\frac{1}{v}-\frac{1}{u}=\frac{1}{f}$$

Also (u) = f

$$\frac{1}{v}-\frac{1}{f}=\frac{1}{f} \qquad \therefore v=\frac{f}{2}$$

4. (3)

$$m = \frac{f}{f-u}$$

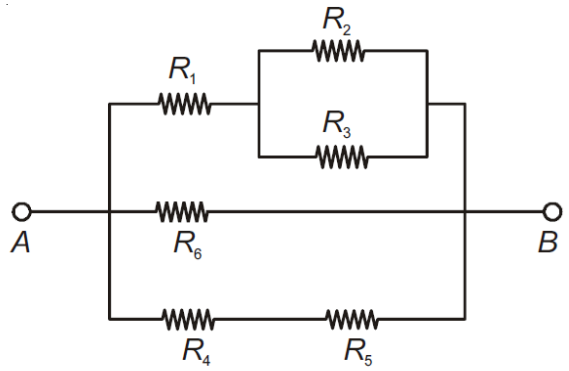
$$f = -0.15m$$

$$m = +2(\text{virtual image})$$

$$2 = \frac{-0.15}{-0.15-u}$$

$$\Rightarrow = -.075m \text{ or } -7.5cm.$$

5. (3)

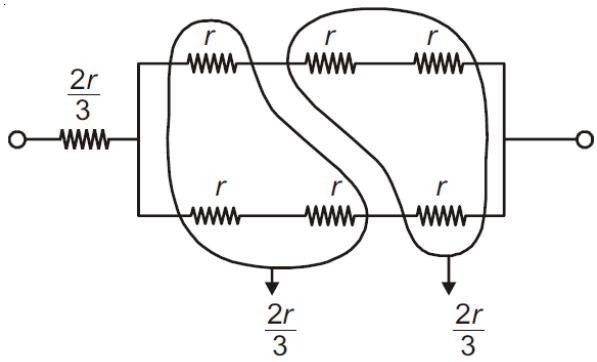


R_2 and $R_3 \Rightarrow$ Parallel

6. (3)

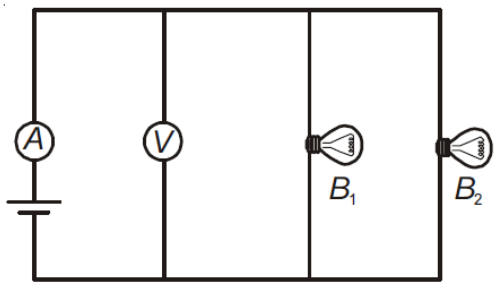
Resistance is the opposition to the flow of current

7. (2)



$R_{net} = 2r$

8. (3)



If B_2 gets fused, R_{net} increases, i decreases, but reading of V remains same.

9. (3)

For (L / 2, D), resistance is minimum

10. (1)

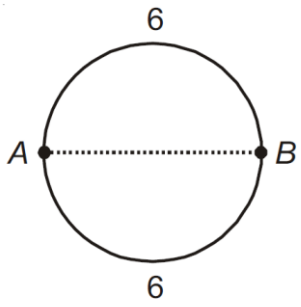
$$x = \frac{\rho l}{A}$$

$$20 = \frac{\rho(2l)}{(A/2)}$$

$$\frac{x}{20} = \frac{1}{4}$$

$$x = 5$$

11. (3)



$R = 3$

12. (4)
Because here earth's magnetic field has vertical component only.

13. (2)
They will move in helical path while trapped in earth's magnetic field and will eventually move towards poles.

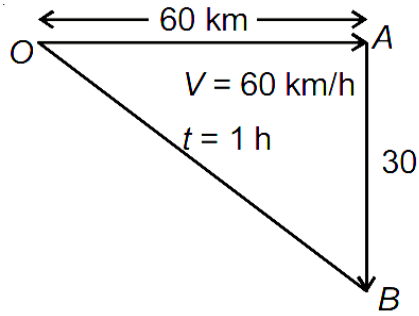
14. (2)

15. (2)
Because stationary magnetic field is zero inside soft ring.

16. (2)

17. (3)

Displacement of car = $\sqrt{60^2 + 30^2} = 30\sqrt{5}$ km



[Distance OA = Speed × Time
$\Rightarrow$ 60 × 1 h = 60 km]

18. (3)

For upstream, Speed $\Rightarrow v - u$ (where $v \rightarrow$ man and $u \rightarrow$ water)

For downstream, Speed $\Rightarrow v + u$

$t_{up} = \dfrac{d}{v-u}$

$t_2 = \dfrac{d}{v-u}$

$\Rightarrow \quad d = (v-u)t_2 \qquad ...(i)$

$t_{down} = \dfrac{d}{v+u}$

$t_1 = \dfrac{d}{v+u}$

$\Rightarrow \quad d = (v+u)t_1 \qquad ...(ii)$

$t_{still} = \dfrac{d}{v}$

$\boxed{t_{still} = \dfrac{2t_1t_2}{t_1+t_2}}$

On equating (i) and (ii)

$(v-u)\,t_2 = (v+u)\,t_1$

$\Rightarrow \quad vt_2 - ut_2 = vt_1 + ut_1$

$\Rightarrow \quad v(t_2 - t_1) = u(t_1 + t_2)$

$\Rightarrow \quad u = \dfrac{v(t_2 - t_1)}{t_2 + t_1}$

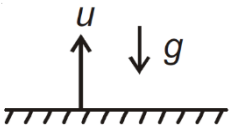
So, $d = \left(v - \dfrac{v(t_2-t_1)}{t_1+t_2}\right)t_2 = vt_2\left(\dfrac{t_1+t_2-t_2+t_1}{t_1+t_2}\right)$

$\boxed{\dfrac{d}{v} = \dfrac{2t_1t_2}{t_1+t_2}}$ → **Remember as shortcut**

19. (2)

Whether body move upwards or downwards the earth tries to pull it downwards only.

Hence during both the motion g will negative. So, negative, negative



20. (2)

$d_s = \dfrac{u^2}{2a} \Rightarrow ds \propto u^2$

$u' = 2u$

$\dfrac{d'}{f} = \dfrac{(2u)^2}{u^2}$

$\Rightarrow \dfrac{d'}{8} = 4$

$\Rightarrow d' = 32$

21. (4)

By newton's second law

$\vec{F} = m\vec{a}$ ....(i)

for (i) Uniform motion means body is moving with constant velocity. By (i) it can be said that only for accelerated motion force is required (2) is true using (i)

(3) Using (i) $\vec{a} = \frac{\vec{F}}{m}$ so this is true

22. (1)

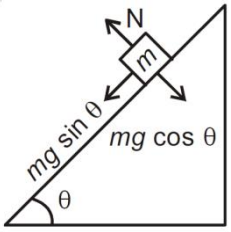
No component of force is in the direction of motion (as $\vec{F} \perp \vec{V}$) so it cannot change the speed of particle. But velocity cannot be constant because force will change the direction of motion.

23. (2)

For constant velocity, no force is required so $\vec{F} = 0$

24. (4)

Force enerted by the plane on the block will be N

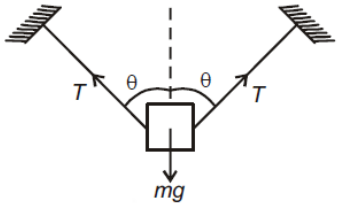


$N = mg\cos\theta$

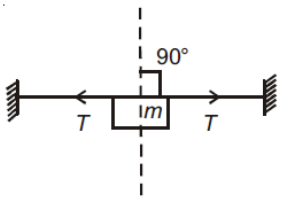
25. (4)

$2T\cos\theta = mg$

$T = \frac{mg}{2\cos\theta}$ ...(i)



To make this string completely straight



$\theta = 90°$

in (i) put $\theta = 90°$

$T = \frac{mg}{2\cos 90°} \approx \infty$

26.

Assume 1000 g (or 1000 mL) of water.

It contains $\frac{1000}{18} = 55.55$ mol of water.

Let the number of moles of A be x.

The mole fraction is 0.2.

$0.2 = \frac{x}{55.55 + x}$

$55.55 + x = 5x$

$55.55 = 4x$

$x = 13.88$ mol.

The molality of the solution is m = $\frac{\text{Number of moles of solute}}{\text{Mass of solvent in kg}} = \frac{13.88 \text{ g/mol}}{1 \text{ kg}} = 13.88$ m.

27. (3)

98% mass of H_2SO_4 means 98g of H_2SO_4 in 100g solid ion

Given, density = 1.84 g/cc = 1.84 g/ml (1cc = 1mL)

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$\therefore \text{Volume} = \frac{100}{1.84}\text{mL} = \frac{100}{1.84 \times 1000}\text{L}$$

$$\text{Now, Molarity} = \frac{\text{Weight given}}{\text{Molecular } \omega t \times \text{volume}}$$

$$= \frac{98 \times 1.84 \times 1000}{98 \times 100}$$

$$= 18.4\text{M}$$

28.

The correct option is **D** 1019.6 g

Given, molality (m) = 0.2 mol/kg

weight of solvent = 1000 g

Since it is a sulphuric acid (H_2SO_4) solution

weight of solute = 0.2 × 98 = 19.6 g

Total weight of solution will be

= 1000 + 19.6 = 1019.6 g

29. (3)

$r_f \rightarrow rn_2$

$r_i \rightarrow rn_1$

$(4)^2 - (3)^2 = 7$

$16 - 9 = 7$

$n_2 = n_f = 4$

$n_1 = n_i = 3$

30. (1)

$V = 2.18 \times 10^8 \frac{2}{h} cm/sec$

for $Li^{+2} = V = \frac{3}{2} \times 2.18 \times 10^8 cm/sec$

$n = 2$

$= 3.27 \times 10^8 cm/sec$

31. (1)

32. (1)

(–) change increases, Nuclear attraction decrease size increases.

33. (3)

Total e^- in CO = 6 + 8 = 14

Bond order = 3

34. (2)

$O_2 \rightarrow 2e^-$ in anti bonding orbital

$He_2^+ \Rightarrow 1e^-$ in anti bonding orbital

35. (1)

$MgCO_3 \rightarrow$ Magnesite

$FeCO_3 \rightarrow$ Siderite

$ZnO \rightarrow$ Zincite

$Ag_2S \rightarrow$ Argentite

36. (3)

37. (1)

38. (1)

In the given structure Ha is present next to C = O,

H_b is in conjugation with C = C and that extends to C = O

H_c has no conjugation
Therefore H_b is most acidic and H_c is least acidic
Therefore the order of acidity is :
$H_b > H_a > H_c$

39. (3)

40. (3)

+I effect of CH_3 group increases electron density on N and makes it a stronger base. So, the order of basic strength would be expected to be $3^o > 2^o > 1^o > NH_3$

But in an aqueous medium presence of hydrogen bonding and bulkier groups affects the basicity.

In $(CH_3)_3N$, alkyl groups hinder the attack of the proton on N. Therefore, it becomes less basic and due to the additive effects of steric hindrance and induction, $(CH_3)_2NH$ is the strongest base in the aqueous medium.

Thus, for an aqueous medium order of basicity is $2^o > 1^o > 3^o > NH_3$

Hence the correct option is C.

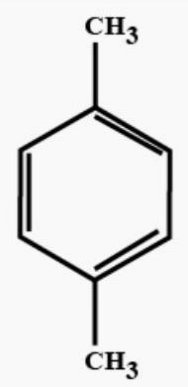
41. (2)
Molar conductance of $NaNO_3$
$=NaCl+AgNO_3 – AgCl$
$=110.3 + 116.5 – 121.6$
$=105.2$

42. (4)

$$\Lambda_m = K \times \frac{1000}{M}$$
$$M = K \times \frac{1000}{\Lambda_m}$$
$$M = \frac{3.06 \times 10^{-6} ohm^{-1} cm^{-1} \times 1000}{1.53 ohm^{-1} cm^{-1} mol^{-1}}$$
$$M = 2 \times 10^{-3}$$
$$M = S = 2 \times 10^{-3}$$
$$K_{sp} = \left[Ba^{2+}\right]\left[SO_4^{2-}\right]$$
$$K_{sp} = S \times S = S^2$$
$$K_{sp} = 4 \times 10^{-6}$$

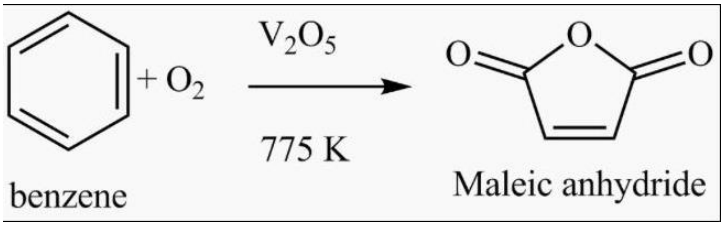
43. (2)

44. (3)
As methyl group is ortho, para directing so this will only ortho product as para is not available.



45. (3)
Since only one product is obtained, all the four aromatic hydrogen atoms are equivalent. This is possible only if the substituents are in para positions

46. (4)
When a mixture of benzene vapour and oxygen is passed over V2O5 catalyst at 775 K, Maleic anhydride is obtained.



47. (3)

Alkaline $KMnO_4$ is a strong oxidizing agent. It oxidizes methyl group attached to benzene can be oxidised to carboxyl group.

Other oxidizing agents that can be used are acidified

$K_2Cr_2O_7$ and dil. HNO_3

48. (4)

$NH_4HS\,(s) \rightleftharpoons NH_3\,(g) + H_2S\,(g)$ $\quad K_P = 64atm^2$

0	0	0
$a - x$	x	x

$\Rightarrow K_P = x^2 = 64\ atm^2 \quad x = 8atm$

total pressure at Eq $\Rightarrow 8 + 8 = 16atm$

49. (4)

50. (1)

pOH of H_2O = 7.0 (at 298K)

According to Le- Chattier's principles:
When temperature increases according to Le Chattier's principle the extra heat would be absorbed that is forward reaction is favoured as it absorbs heat.

$H_2O + H_2O \leftrightharpoons H_3O^+ + OH^-$

$\longrightarrow$ the pH falls, as temperature increases.

$\longrightarrow$ also the pOH decreases since the value of pK_w itself decreases.