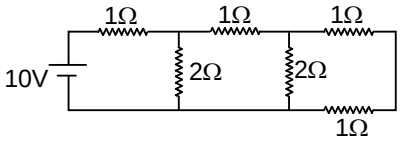
SECTION – 1 (PHYSICS)

1. A ball is released from the top of a tower of height h. It takes time T to reach the ground. What is the height of the ball (from ground) after time T/2 from the starting of the motion ?
(A) h/2 (B) h / 4 (C) 3 h / 4 (D) h /16

2. What is the current supplied by the battery to the given network of resistors connected to the battery of EMF 10 Volts ?

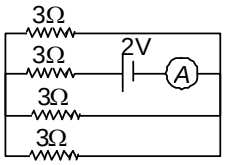


(A) 10 A (B) 5 A (C) 2 A (D) 4 A

3. A wire of resistivity ρ is stretched to double its length, then its new resistivity will
(A) be double (B) not change (C) become half (D) become four times

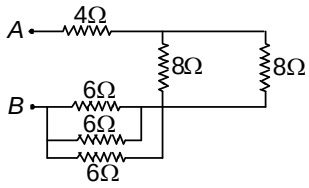
4. When a resistance of 4 ohm is connected across a cell, the current is 1A. When the resistance is increased to 8 ohm, what will be the new value of current?
(A) 1.0 A (B) 2.0 A (C) 0.5 A (D) 4.0 A

5. Four resistors of 3 Ω each are connected to a 2V battery as shown in the figure. What is the reading of the ammeter in the circuit?
(Hint: Ammeter measures the current in the circuit & its own resistance is zero)



(A) (1/8) amp (B) (3/8) amp
(C) (1/2) amp (D) 2 amp

6. What is the resistance between points *A* and *B* in the circuit shown in the figure?
(A) 4 Ω (B) 6 Ω
(C) 10 Ω (D) 8 Ω

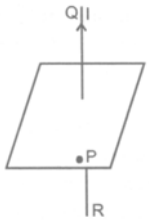


7. When a bar magnet is broken into two pieces :
(A) we will have a single pole on each piece (B) each piece will have two unlike poles
(C) each piece will have two like poles (D) None of these

SPACE FOR ROUGH WORK

8. The magnetic field intensity produced due to a current carrying circular coil is maximum at :
   (A) any point
   (B) the centre of the coil
   (C) any point lying on the axis of the coil
   (D) points lying between centre of the coil and its circumference

9. In the figure QR is a vertical conductor and the current **I** flows from R to Q. P is a point on the horizontal plane and is to the south of the wire. The direction of the magnetic field at P due to the current will be towards :



   (A) upward (B) north
   (C) east (D) west

10. The device which is used for converting mechanical energy into electrical energy is called:
   (A) electric motor (B) Electric generator (C) transformer (D) battery

11. Lenz's law is a consequence of the law of conservations of :
   (A) energy (B) momentum (C) angular momentum (D) charge and mass

12. The device which is used for converting electrical energy into mechanical energy is called :
   (A) electric motor (B) dynamo (C) transformer (D) battery

13. The effect of using split rings in a simple DC motor is that :
   (A) the direction of rotation of the coil is reversed
   (B) the current in the coil always flows in the same direction
   (C) the direction of the current flowing in the coil is reversed
   (D) None of these

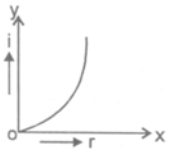
14. Choose the source of energy which is different from others :
   (A) Wood (B) Falling water (C) Wind (D) Petroleum

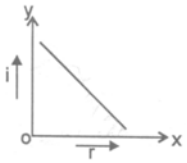
15. The vast amount of sea weeds present in oceans may provide an endless source of :
   (A) nuclear energy (B) ocean thermal energy
   (C) methane (D) none of these

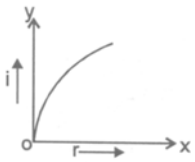
SPACE FOR ROUGH WORK

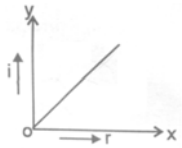
16. Radiations used to get relief from body-aches are :
(A) I.R.radiations (B) U.V. radiations (C) Visible radiations (D) None of these

17. Which of the following correctly represents graphical relation between angle of incidence (i) and angle of reflection (r) ?

(A) 

(B) 

(C) 

(D) 

18. A convex mirror of focal length f (in air) is immersed in a liquid $\left(\mu = \frac{4}{3}\right)$. The focal length of the mirror in liquid will be :

(A) $\left(\frac{3}{4}\right)$f (B) $\left(\frac{4}{3}\right)$f (C) f (D) $\left(\frac{7}{3}\right)$f

19. When a ray of light enters a transparent medium it undergoes change is :
(A) Frequency only (B) Wavelength only
(C) Wavelength and velocity both (D) Velocity and frequency both

20. The power of a lens whose focal length is 25 cm is :
(A) 4 Dioptre (B) 25 Dioptre (C) 0.04 Dioptre (D)2.5 Dioptre

21. The velocity of sound in vacuum is
(A) 420m s^{-1} (B) 330 m s^{-1} (C) 288m s^{-1} (D) 0 m s^{-1}

22. A car moving with a speed of 50km/hr, can be stopped by brakes after at least 6m. If the same car is moving at a speed of 100km/hr, the minimum stopping distance is:
(A) 6m (B) 12m (C) 18m (D) 24m

23. The SI unit of resistance is
(A) ohm (B) farad (C) Siemen (D) Pascal

24. Time is a …… quantity.
(A) Scalar (B) Vector
(C) Neither (A) nor (B) (D) Both (A) and (B)

25. Which of the following is/are true for evaporation process?
(A) It takes place at all temperatures (B) It is a slow process
(C) Its occurs at the surface of the liquid (D) All of these

SPACE FOR ROUGH WORK

SECTION – 2 (CHEMISTRY)

26. Which of following reaction is effected by sunlight?
(A) $Fe_{(s)} + CuSO_{4(a)} \rightarrow FeSO_{4(aq)} + Cu_{(s)}$ (B) $Pb_{(s)} + +CuCl_{2(aq)} + PbCl_{2(aq)} + Cu_{(s)}$
(C) $2AgCl_{(s)} \rightarrow 2Ag_{(s)} + Cl_{2(g)}$ (D) $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} + 2NaCl_{(aq)}$

27. A colourless and odourless gas P is evolved during thermal decomposition of lead nitrate. P reacts with the main component of biogas to form compounds Q and R. P, Q and R respectively are
(A) CO_2, O_2 and Cl_2 (B) N_2O, O_2 and H_2O (C) O_2, CO_2 and H_2O (D) O_2, CO_2 and H_2

28. Which of the following substance is a white precipitate in the following reaction?
$Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} + 2NaCl_{(aq)}$
(A) $BaSO_4$ (B) $BaCl_2$ (C) NaCl (D) Na_2SO_4

29. Which of the following reaction is not redox reduction?
(A) $ZnO + C \rightarrow Zn + CO$ (B) $2Cu + O_2 \xrightarrow{\Delta} 2CuO$
(C) $CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$ (D) $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

30. Which of the following is not an example of corrosion?
(A) Black coating on silver (B) Green coating on copper
(C) Iron coated with reddish brown powder (D) White coating on magnesium oxide

31. The acid present in vinegar is
(A) Acetic acid (B) Citric acid (C) Tartaric acid (D) Oxalic acid

32. Bleaching powder is represented as
(A) CaO (B) $CaCO_3$ (C) $Ca(OH)_2$ (D) $CaOCl_2$

33. The chemical compound used for supporting fractured bones is
(A) Quick line (B) Gypsum (C) Plaster of paris (D) Washing soda

34. Which of the following is an acidic salt?
(A) Na_2CO_3 (B) $NaHCO_3$ (C) $CaCO_3$ (D) $CuSO_4$

SPACE FOR ROUGH WORK

35. Which one of the following is used in soda acid fire extinguisher?
(A) $NaHCO_3$ (B) NaCl (C) NaOH (D) Na_2SO_4

36. Which of the following gas is evolved at cathode during the electrolysis of brine?
(A) No_2 (B) H_2 (C) Cl_2 (D) O_2

37. Which of the following metal catches fire when it comes contact with air?
(A) Copper (B) Potassium (C) Aluminum (D) lead

38. Which of the following is an electrovalent compound?
(A) CO_2 (B) CH_4 (C) NaCl (D) H_2O

39. Dehydration of ethanol results in the formation of a compound 'X' along with water, Hydrogenation of 'X' forms another compound 'Y'. 'X' and 'Y' respectively are :
(A) Ethene and ethane (B) Ethanol and ethane
(C)Ethane and methane (D) Ethanoic acid and methane

40. Which of the following organic compound contains aldehyde group?
(A) Propanal (B) Propanol (C) Propanone (D) Propanoic acid

41. The sweet smelling substance among following is
(A) Acid (B) Alcohol (C) Ketones (D) Ester

42. The modern periodic table was given by
(A) Dobrenier (B) Newland (C) Henry Moseley (D) Mendeleev

43. The one which is metalloid among the following is
(A) Na (B) Si (C) Mg (D) Cs

44. M-shell can have 18 electrons. No. of elements in third period is
(A) 2 (B) 8 (C) 18 (D) 32

45. The element which have same valency that of fluorine?
(A) Chlorine (B) Carbon (C) Nitrogen (D) Oxygen

SPACE FOR ROUGH WORK

46. The acid present in Apple is
(A) Tartaric acid (B) Oxalic acid (C) Maleic acid (D) Malic acid

47. Bleaching powder is dissolved in water to liberate
(A) Cl_2 (B) O (C) O_2 (D) O_3

48. Which of the following compound is more soluble in benzene?
(A) CH_3Cl (B) KCl (C) CH_2Cl_2 (D) $CHCl_3$

49. Thermite process is an example of a
(A) Decomposition reaction (B) Combination reaction
(C) Displacement reaction (D) Neutralisation reaction

50. Which of the following is not a redox reaction?
(A) $CuO+H_2 \rightarrow Cu+H_2O$ (B) $ZnO+C \rightarrow Zn + CO$
(C) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$ (D) $MnO_2+ 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

SPACE FOR ROUGH WORK

SECTION – 3 (BIOLOGY)

51. A fertilized ovule develops into a _____ in an angiosperm plant
(A) seed (B) fruit (C) flower (D) cotyledon

52. An unisexual flower
(A) Do not have carpel (B) Do not have stamen
(C) Has either carpel or stamen (D) Has either petal or sepal

53. The phosphorous cycle differs from those of carbon and nitrogen in that
(A) It lacks a gaseous phase (B) It lacks a liquid phase
(C) Living organisms don't need phosphorous (D) All of these

54. Which light is most effective for stomatal opening?
(A) blue (B) green (C) yellow (D) orange

55. Geotaxis movement is caused due to stimulus given by
(A) air (B) gravity (C) resistance (D) shaking

56. Re-arrange the following taxonomic terms in correct hierarchical order.
Order-Family-Phylum-Class
(A) Family-Phylum-Class-Order (B) Phylum-Order-Class-Family
(C) Class-Phylum-Family-Order (D) Phylum-Class-Order-Family

57. Garderners pinch-off tip of plants to stimulate their side (lateral) growth. Which one of the following is implicated in this phenomenon?
(A) Auxin (B) Cytokinin
(C) Gibberellin (D) Abscisic acid

58. Which of the following can be included as under microbody?
(A) Glyoxysome (B) Peroxisome
(C) Glycosome (D) All of these

59. The law which explains the probability distribution for the alleles of the trait is
(A) Law of Independent Assortment (B) Law of Dominance
(C) Law of Segregation (D) Law of Paired Facts

60. Which of the following is environmentally sustainable?
(A) Recovery of useful material from scraps.
(B) Unwise excessive use of potable of water for washing/cleaning.
(C) Use of plastic bags instead of jute bags.
(D) Excessive use of private vehicles than public transport.

61. In 100% self –pollination,
(A) Pollen from anther of a flower is transferred to stigma of same flower in same plant.
(B) Pollen from anther of a flower is transferred to stigma of different flower in same plant
(C) Pollen from anther of a flower is transferred to stigma of different flower in different plant
(D) Pollen from stigma of a flower is transferred to anther of same flower in same plant.

62. From the following, that will not be included in biodiversity hot-spot?
(A) Forest (B) Desert (C) Seas (D) None of these

63. Eggs having large quantity of yolk in them are termed as-
(A) Alecithal (B) Microlecithal (C) Macrolecithal (D) Telolecithal

64. The effect of an overdose of insulin causes _____ resulting in _____ in a normal person.
(A) decrease in blood glucose level; impaired brain function, unconsciousness and shock.
(B) increase in blood glucose level; loss of brain function leading to coma and death.
(C) increase in blood glucose level; hyperactive brain function.
(D) decrease in blood glucose level; hyperactive brain function.

65. (i) The process of filtration of blood under pressure is called ultra-filtration
(ii) It occurs in the urinary bladder
(A) (i) is correct. (ii) is incorrect (B) Both (i) & (ii) are correct
(C) (i) is incorrect. (ii) is correct (D) Both (i) & (ii) are incorrect

66. The lobe in the cerebrum concerned with smell is
(A) Occipital lobe (B) Temporal lobe (C) Parietal lobe (D) Frontal lobe

67. Vermiform appendix is an example of
(A) Homologous organ (B) Analogous organ
(C) Vestigial organ (D) Analytic organ

68. The hormone produced by the pineal gland responsible for promoting sleep is
(A) Melatonin (B) Thyroxine (C) Trophic Hormone (D) Calcitonin

69. The chemical transmitter of nerve impulses is
(A) Cholinesterase (B) Hexokinase (C) Acetylcholine (D) Acetyl co-A

70. The passage of the exhaled air in human beings
(A) Trachea – Lungs – larynx – pharynx – alveoli – bronchioles
(B) Nose – larynx – pharynx – bronchus – alveoli – bronchioles – Lungs
(C) Alveoli – bronchioles – bronchi – trachea – larynx – pharynx – nostrils
(D) Nose – mouth – lungs – alveoli – bronchioles – bronchi

71. _____ forms an association between maternal and foetal tissue meant for physiological exchange.
(A) Umblical Cord (B) Placenta (C) Amnion (D) Chorion

72. The duct which transports sperms from epididymis to urethra is-
(A) Seminiferous tubule (B) Vas deferens
(C) Ureter (D) Ducts of testis

73. The chemical released by blood platelets for blood coagulation is
(A) Fibrinogen (B) Fibrin (C) Thromboplastin (D) Prothrombin

74. Respiration in some animals occur through their skin. Such respiration is called
(A) Cutaneous (B) Pulmonary (C) Spiracular (D) Tracheal

75. Which vitamin deficiency causes rickets ?
(A) Vitamin A (B) Vitamin B (C) Vitamin C (D) Vitamin D

ANSWER KEY ACE OF PACE CLASS 10th MEDICAL		
PHYSICS	**CHEMISTRY**	**BIOLOGY**
1. (C)	26. (C)	51. (A)
2. (B)	27. (C)	52. (C)
3. (B)	28. (A)	53. (A)
4. (C)	29. (B)	54. (A)
5. (C)	30. (D)	55. (B)
6. (C)	31. (A)	56. (D)
7. (B)	32. (D)	57. (B)
8. (B)	33. (C)	58. (D)
9. (C)	34. (D)	59. (C)
10. (B)	35. (A)	60. (A)
11. (A)	36. (B)	61. (A)
12. (A)	37. (B)	62. (B)
13. (C)	38. (C)	63. (C)
14. (D)	39. (A)	64. (A)
15. (C)	40. (A)	65. (A)
16. (A)	41. (D)	66. (B)
17. (D)	42. (C)	67. (C)
18. (C)	43. (B)	68. (A)
19. (C)	44. (B)	69. (C)
20. (A)	45. (A)	70. (C)
21. (D)	46. (D)	71. (B)
22. (D)	47. (A)	72. (B)
23. (A)	48. (D)	73. (C)
24. (A)	49. (C)	74. (A)
25. (D)	50. (C)	75. (D)

ACE OF PACE (SOLUTION)

1. $S = ut + \frac{1}{2}at^2$

   $H = 0 + \frac{1}{2}gT^2$

   $at\ t = \frac{T}{2} \Rightarrow S = 0 + \frac{1}{2}g\left(\frac{T}{2}\right)^2$

   $= \frac{1}{8}gT^2 = \frac{H}{4}$

   height from ground = $\frac{3H}{4}$

2. Equivalent Resistance = 2Ω

   $I = \frac{V}{R} = \frac{10}{2} = 5A$

3. ' ρ ' resistivity only changes with change in temperature.

4. V = IR

   Hence $I = \frac{V}{R}$

5. Equivalent resistance of circuit = 4Ω

   $I = \frac{V}{R} = \frac{2}{4} = \frac{1}{2}A$

6. $R_{series} = R_1 + R_2 + R_3$

   $\frac{1}{R_{parallel}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

7. Magnetic monopoles do not exist.

8. $\vec{B}$ is maximum at the centre of coil.

   $\vec{B} = \frac{\mu_0 I}{2R}$

9. Use right hand thumb rule to find the direction of magnetic field.

10. Electric generator converts mechanical energy into electrical energy.

11. Theory based

12. Electric motor converts electrical energy into mechanical energy.

13. Theory based

14. Petroleum is the only non-renewable source.

15. Methane can be synthesized from ocean plants.

16. I.R. radiation is used for curing body aches.

17. Angle of incidence = Angle of reflection

18. Focal length of mirror will remain unchanged.

19. Frequency remains unchanged as it depends on the source.

20. $P = \frac{1}{f} = \frac{1}{0.25m} = 4\,\text{Dioptre}$

21. (B) Theoritical question

22. (D) $v^2 = u^2 + 2as$

$v^2 \propto s$

$(50)^2 \propto 6$ (i)

$(100)^2 \propto s$ (ii)

Divide equation (i) and (ii)

$\frac{50 \times 50}{100 \times 100} = \frac{6}{s}$

$s = 6 \times 4 = 24m$

23. (A) ohm

24. (A) Scalar

25. (D) Theoritical question

26. (c)

$2AgCl_{(s)} \xrightarrow{\text{Sunlight}} 2Ag_{(s)} + Cl_{2(g)}$

$\therefore$ Silver chloride turns grey due to its decomposition in sunlight to form silver metal.

27. (c)

$2Pb(NO_3)_2 \xrightarrow{\Delta} 2PbO + 4NO_2 + \underset{(P)}{2O_2}$

$CH_4 + 2O_2 \rightarrow \underset{(Q)}{CO_2} + \underset{(R)}{2H_2O}$

Biogas

28. (a)

$BaSO_{4(s)}$ is a insoluble white precipitate.

29. (b)

In this reaction, 'Cu' is oxidized to CuO, this reaction involve only oxidation and not reduction.

30. (d)

'Mg' burns in air with a dazzling flame due to magnesium oxide in the absence of moisture, but all the other three reactions (a), (b) and (c) occurs in the presence of moisture.

31. (a)
Acetic acid is present in vinegar

32. (d)
Bleaching powder is given as $CaOCl_2$ (Calcium chloro hyperchlorite)

33. (c)
$CaSO_4.\frac{1}{2}H_2O$ (plaster of paris) which doctors use as plaster for supporting fractured bones.

34. (d)
$CuSO_4$ is acidic salt because it is made from $Cu(OH)_2$ (weak base) and H_2SO_4 (strong acid)

35. (a)
Sodium hydrogen carbonate $(NaHCO_3)$ is used in soda acid fire extinguisher

36. (b)
$NaCl_{(aq)} \rightarrow Na^+_{(aq)} + Cl^-_{(aq)}$
$(Brine)$
Cathode:-
$Na^+ + e^-_{(aq)} \rightarrow Na(Hg)$
$2Na + 2H_2O \rightarrow 2NaOH + H_{2(g)} \uparrow$

37. (b)
Potassium is a reactive metal catches fire with air

38. (c)
NaCl is electrovalent (or) ionic compound exists as Na^+ and Cl^- ions.

39. (a)
$$\underset{\text{Ethanol}}{CH_3CH_2OH} \xrightarrow[-H_2O]{\Delta} \underset{\text{Ethene}(x)}{CH_2=CH_2}$$

$$\underset{\text{Ethene}}{CH_2=CH_2} \xrightarrow{H_2} \underset{\text{Ethane}}{CH_3-CH_3}$$
(X) (Y)

40. (a)
Propanol is CH_3-CH_2-CHO having aldehyde group $(-CHO)$

41. (d)
Esters are sweet smelling substances

42. (c)
In 1993, Henry Moseley discovered the modern periodic table.

43. (b)

Silicon (Si) is a metalloid, because it exhibits same properties of both metals and non-metals

44. (b)
M-shell $-2\times(3)^2 = 18$ electrons, but the outermost shell can have only 8 electrons, so the third period also has only 8 elements

45. (a)
Chlorine (Cl) show same valency as that of fluorine as both have same number of valence electrons in outermost shell ie, 7 electrons.

46. (D) Apple contains Malic acid which is a dicarboxylic acid

47. (A) $CaOCl_2 + H_2O \rightarrow Ca(OH)_2 + Cl_2$ (Bleaching powder)

48. (D) $\therefore CHCl_3$ is covalent and less polar hence dissolves in benzene.

49. (C) $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
This reaction is involved in thermite process.
It is a displacement reaction

50. (C) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$
This is a precipitation reaction

51 (A) Seed is the fertilized ovule

52. (C) Carpel and stamen are essential whorls of flowers which play a direct role in reproduction. When a flower bears either of them, the flower is called unisexual.

53. P cycle dont have atmospheric stage

54. Phytochrome and blue light induce stomatal opening.

55. Geotaxis is the movement w.r.t. gravity

56. Correct order is kingdom $\rightarrow$ Phylum $\rightarrow$ Class $\rightarrow$ Order $\rightarrow$ Family $\rightarrow$ Genus $\rightarrow$ species

57. Auxin promotes apical dominance and cytokinin promotes lateral bud formation.

58. Small sized organelles are called microbodies of cells

59. Segregation causes the separation and recombination of alleles

60. Recycling and reuse is best for environmental sustainability

61. Same flower and same plant can give 100% self pollination

62. Desert

63. Eggs of reptiles and birds are with abundant yolk i.e. macrolecithal to store more nutrients.

64. Insulin hormone is hypoglycemic i.e. it decreases blood sugar level by enabling more glucose to be transported in tissues to be used for cellular respiration. Hence, overdose of it shall lead to sudden decrease in blood sugar level and brain is affected leading to unconsciousness.

65. Urine formation involves ultrafiltration that takes place in malphigian body.

66. Olfactory area is present in temporal lobe.

67. Vermiform appendix is a remnant of organ present in our ancestors which is highly reduced in us and hence considered vestigial.

68. Biological rhythm/circadian rhythm is maintained by melatonin which is a derivative of serotonin.

69. Most common neurotransmitter is Acetylcholine.

70. (C)

71. Placenta is a physiological contact between foetal and maternal blood.

72. The epididymis leads to Vas deferens, that leads to ejaculatory duct opening in urethra.

73. (C)

74. (A)

75. (D)