



**SHARADA VIDYANIKETHANA PUBLIC SCHOOL
&
PU COLLEGE**

PRATIBHA PRAVEENA SCHOLARSHIP EXAMINATION

INSTRUCTIONS

1. The booklet is your Question Paper. Do not break the seal of this booklet before being instructed to do so by the invigilator.
2. The question paper Series CODE is printed on the right hand top corner of this sheet.
3. Blank spaces and blank pages are provided in the question paper for your rough work. No additional sheets will be provided for your rough work.
4. Blank papers, clipboards, log tables, slide rules, calculators, camera, cellular phones, papers and electronic gadgets are **NOT** allowed inside the examination hall.
5. The answer sheet, a machine – readable Optical Mark Recognition (OMR), is provided separately.
6. **DO NOT TAMPER WITH/MUTILATE THE OMR OR THE BOOKLET**
7. On breaking the seal of the booklet check that it contains 9 pages and all the 90 questions and corresponding answer choices are legible.
8. A candidate has to write his/ her answer in the OMR sheet by appropriate bubble with the help of **Black/Blue ball point pen** as the correct answer (s) of the question attempted.
9. Write all information and sign in the box provided on part of the **OMR**.
10. The duration of test is **2 Hours** and question paper contains **90 questions**. The **Max marks are 360**. Question Paper consists of 4 parts (Physics, Chemistry, Mathematics and Biology). Physics, Chemistry , Biology consists of 20 questions and Mathematics consists of 30 questions.
11. All questions are multiple choice questions. Each question has four choices **(a), (b), (c) and (d)** out of which **ONLY ONE** is correct.
12. Each correct answer carries **4 Mark**, while **1 mark will be deducted for every wrong answer**. [Guessing of answer is harmful]

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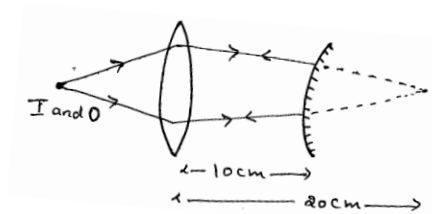
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1. Light is travelling from medium A to medium B. Where refractive index of B is 1.3. For some angle of incidence light is completely reflected back to the same medium. The refractive index of A is

a. 1 b. 1.2 c. 1.7 d. 1.25

2. In the diagram image and object are in the same place. Find focal length of convex mirror

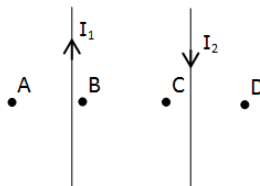


a. 20 cm b. 10 cm c. 30 cm d. 5 cm

3. When two parallel conductors carrying current in opposite directions. They will

a. Attract each other c. Total force between them zero
b. Repel each other d. None of these

4. In the below diagram magnetic field may be zero at,



a. A b. B c. C a. both B and C

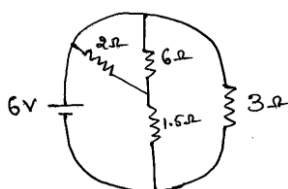
5. Inductance of Inductor depends on

a. Applied voltage
b. Current flowing through the inductor
c. Frequency of applied signal
d. None of the above

6. Displacement of particle is given by the equation $x = 5t + 6$. What is its acceleration

a. Zero b. 5 m/s^2 c. 6 m/s^2 d. 30 m/s^2

7. Two bodies of masses 1 kg and 2 kg have equal momentum. Then the ratio of their kinetic energy is
 a. 1 : 3 b. 1 : 1 c. 2 : 1 d. 3 : 1
8. The total current supplied to the circuit by the battery is



- a. 4 A b. 2 A c. 1 A d. 6 A
9. If convex mirror of focal length 10 cm is immersed in water of refractive index $\frac{4}{3}$. Then its new focal length will be
 a. More than 10 cm b. Less than 10 cm c. 10 cm d. Zero
10. Sound wave is
 a. Longitudinal wave c. Non mechanical wave
 b. Transverse wave d. None of these
11. Pressure – Temperature graph for isobaric process
 a. Straight line parallel to x – axis
 b. Straight line with increase in pressure
 c. Parabola
 d. Straight line with decrease in pressure
12. The sensitivity of mercury thermometer can be increased by
 a. Increasing the diameter of the capillary tube
 b. Reducing the diameter of the capillary tube
 c. Decreasing the size of the bulb
 d. Using thicker walled glass bulb
13. If $360^\circ = 2\pi$ radian, then angular speed of minute hand of clock is
 a. $0.105 \text{ rad sec}^{-1}$ c. $0.207 \text{ rad sec}^{-1}$
 b. $0.00174 \text{ rad sec}^{-1}$ d. $0.3127 \text{ rad sec}^{-1}$
14. A bomb of mass 18 kg at rest explodes into two pieces of masses 6 kg and 12 kg. The velocity of 12 kg mass is 4 m/s. The kinetic energy of the other mass is
 a. 288 J b. 192 J c. 96 J d. 144 J
15. Average voltage in the cycles of AC signal where peak voltage is 2 V is
 a. 2 V b. 1 V c. 0.5 V d. Zero
16. A stone of mass 2 kg is projected upwards with K.E of 98 J. The height at which the K.E of the body becomes half its original value

- a. 5 m b. 2.5 m c. 1.5 m d. 0.5 m

17. Value of gravitational constant

- a. 9.8 m/s² c. 6.67 × 10⁻¹¹ m³ Kg⁻¹ s⁻²
 b. 9.8 m/s d. 6.67 × 10⁻¹¹ N Kg² s⁻¹

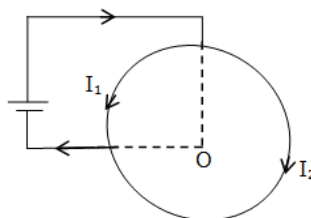
18. In AC generator, current is maximum when angle between the magnetic field and plane containing the loop is

- a. 90 b. 0 c. 45 d. 60

19. A body falling from rest describes distance s_1, s_2 and s_3 in 1st, 2nd and 3rd second. Then the ratio of $s_1 : s_2 : s_3$ is

- a. 1 : 4 : 9 b. 1 : 3 : 5 c. 1 : 2 : 3 d. 1 : 2 : 4

20. Wire is bent into a circular loop and battery is connected at A and B ends as shown in the figure. The ratio of I_1 and I_2 is

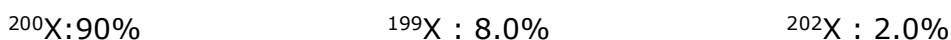


- a. 3 : 1 b. 2 : 1 c. 1 : 1 d. 4 : 1

21. Find the formula of halide of a metal whose successive ionization enthalpies are $x, 2x, 5x, 100x$ kJ mol⁻¹ respectively

- a. MX b. MX₂ c. MX₃ d. M₂X

22. An element, X has the following isotopic composition:



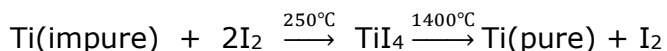
The weighted average atomic mass of the naturally occurring element X is closest to

- a. 201 amu b. 202 amu c. 199 amu d. 200 amu

23. Which of the following molecules has the maximum dipole moment?

- a. CO₂ b. CH₄ c. NH₃ d. NF₃

24. Which process of purification is represented by the following scheme?



- a. Cupellation c. electrolytic refining
 b. poling d. Van-Arkel process

25. Malachite ore has

- a. Cu b. Mg c. Ag d. Al

26. Which of the following contains the least number of molecules?

- a. 4.4 g CO₂ b. 3.4 g NH₃ c. 1.6 g of CH₄ d. 3.2 g SO₂
27. Which mixture of gases at room temperature does not obey Dalton's law of partial pressure?
- a. NO₂ and O₂ b. NH₃ and HCl c. CO and CO₂ d. SO₂ and SO₃
28. Which one of the following removes temporary hardness of water?
- a. Slaked lime b. Plaster of paris c. CaCO₃ d. Hydrolith
29. The carbon – carbon bond length in benzene is
- a. Same as in C₂H₄ c. In between C₂H₄ and C₂H₂
b. In between C₂H₆ and C₂H₂ d. In between C₂H₆ and C₂H₄
30. The correct order of ionic character of oxides of alkali earth metal
- a. MgO > CaO > SrO > BaO c. CaO > SrO > BaO > MgO
b. BaO > SrO > CaO > MgO d. SrO > BaO > MgO > CaO
31. Graphite is a good conductor of electricity due to
- a. Its giant tetrahedral polymer structure
b. Its high refractive index
c. Presence of free and Mobile electrons
d. High I.P. value of carbon
32. 'Be' is diagonally related with
- a. Mg b. Al c. Si d. P
33. Which is mineral of Lead
- a. Galena b. Cinnabar c. Cryolite d. Dolomite
34. Which concept best explains the fact that o-nitrophenol is more volatile than p-nitrophenol ?
- a. Resonance c. Hydrogen bonding
b. Hyperconjugation d. Steric hindrance
35. The compound A on heating gives a colourless gas and residue that is dissolved in water to obtain B. excess of CO₂ is bubbled through aq. solution of B, C is formed which is recovered in the solid form. Solid C on gentle heating gives back A. the compound is
- a. Na₂CO₃ b. K₂CO₃ c. CaSO₄.2H₂O d. CaCO₃
36. Aluminium is used for making alloys because of its
- a. Resistance to corrosion c. Heaviness
b. Poor conductivity d. All of these
37. Which of the following metal is present in the anode mud during the electrolytic refining of copper?

- a. Sodium b. Aluminium c. Gold d. Iron
38. The mole fraction of alcohol in water is 0.100. Calculate its molality.
- a. 5.23 m b. 6.17 m c. 4.32 m d. 3.90 m
39. The dipole moment of H_2O_2 is 2.1 D. This indicates that the structure of H_2O_2 is :
- a. Linear b. Non – linear c. Symmetrical d. None
40. In acetylene molecule, the two carbon atoms are linked by
- a. One sigma bond and two pi bonds c. Three sigma bonds
b. Two sigma bonds and one pi bond d. Three pi bonds
41. Which of the following rational numbers have terminating decimal?
- i. $\frac{16}{225}$ ii. $\frac{5}{18}$ iii. $\frac{2}{21}$ iv. $\frac{7}{250}$
- a. i and ii b. ii and iii c. i and iii d. i and iv
42. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then
- a. $k < 4$ b. $k > 4$ c. $k \geq 4$ d. $k \leq 4$
43. If a and b can take values 1,2,3,4 the number of equations of the form $ax^2 + bx + 1 = 0$ having real roots is,
- a. 10 b. 7 c. 6 d. 12
44. The length of the tangent drawn from a point 8 cm away from the centre of a circle of radius 6 cm is
- a. $\sqrt{7}$ cm b. $2\sqrt{7}$ cm c. 10 cm d. 5 cm
45. At one end of diameter PQ of a circle of radius 5 cm tangent XPY is drawn to the circle. The length of chord AB parallel to XY and at a distance of 8 cm from P is
- a. 5 cm b. 6 cm c. 7 cm d. 8 cm
46. If $f(x) = ax^2 + bx + c$ has no real zeros and $a + b + c < 0$, then
- a. $c = 0$ b. $c > 0$ c. $c < 0$ d. None of these
47. The sum of 'n' terms of two A.P's are in the ratio $5n + 9 : 9n + 6$. Then, the ratio of their 18th term is
- a. $\frac{179}{321}$ b. $\frac{178}{321}$ c. $\frac{175}{321}$ d. $\frac{176}{321}$
48. If $A + B = 90^\circ$, then $\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B} - \frac{\sin^2 B}{\cos^2 A}$ is equals to
- a. $\cot^2 A$ b. $\cot^2 B$ c. $-\tan^2 A$ d. $-\cot^2 A$
49. The radius of a circle is 20 cm. It is divided into four parts of equal area by drawing three concentric circles inside it. Then, the radius of the largest of three concentric circles drawn is
- a. $10\sqrt{5}$ cm b. $10\sqrt{3}$ cm c. 10 cm d. $10\sqrt{2}$ cm
50. If the sum of the areas of two circles with radii r_1 and r_2 is equal to the area of a circle of radius 'r', then $r_1 + r_2$

- a. $> r^2$ b. $= r^2$ c. $< r^2$ d. None of these
51. A card is drawn at random from a pack of 52 cards. The probability that the drawn card is not an ace is
- a. $\frac{1}{13}$ b. $\frac{9}{13}$ c. $\frac{4}{13}$ d. $\frac{12}{13}$
52. The probability that a non – leap year has 53 Sundays is
- a. $\frac{2}{7}$ b. $\frac{5}{7}$ c. $\frac{6}{7}$ d. $\frac{1}{7}$
53. ABC is a right angled triangle at A. A circle is inscribed in it, the length of the two sides containing the right angle are 6 cm and 8 cm then the radius of circle is _____
- a. 6 cm b. 8 cm c. 14 cm d. 2 cm
54. The area of the triangle formed by the line $\frac{x}{a} + \frac{y}{b} = 1$ with the coordinate axes is
- a. ab b. $2ab$ c. $\frac{1}{2} ab$ d. $\frac{1}{4} ab$
55. A rectangular sheet of paper 40 cm x 22 cm is rolled to form a hollow cylinder of height 40 cm. The radius of the cylinder is
- a. 3.5 cm b. 7 cm c. $\frac{80}{7}$ cm d. 5 cm
56. The exponent of 2 in the prime factorization of 144 _____
- a. 4 b. 5 c. 6 d. 3
57. The distance of the point (4,7) from x – axis is
- a. 4 b. 7 c. 11 d. $\sqrt{65}$
58. The arithmetic mean of 1,2,3,, n is
- a. $\frac{n+1}{2}$ b. $\frac{n-1}{2}$ c. $\frac{n}{2}$ d. $\frac{n}{2} + 1$
59. If the mean of first n natural numbers is $\frac{5n}{9}$, then $n =$
- a. 5 b. 4 c. 9 d. 10
60. If the sum of ' p ' terms of an AP is ' q ' and the sum of ' q ' terms is P , then the sum of $p + q$ terms will be
- a. 0 b. $p - q$ c. $p + q$ d. $-(p + q)$
61. If $x = r \sin \theta \cos \phi$, $y = r \sin \theta \sin \phi$ and $z = r \cos \theta$ then
- a. $x^2 + y^2 + z^2 = r^2$ c. $x^2 - y^2 + z^2 = r^2$
b. $x^2 + y^2 - z^2 = r^2$ d. $z^2 + y^2 - x^2 = r^2$
62. If the difference between the circumference and radius of a circle is 37 cm, then using $\pi = \frac{22}{7}$, the circumference (in cm) of the circle is
- a. 154 b. 44 c. 14 d. 7
63. Two different coins are tossed simultaneously. The probability of getting at least one head is

- a. $\frac{1}{4}$ b. $\frac{1}{8}$ c. $\frac{3}{4}$ d. $\frac{7}{8}$

64. The angle of elevation of the top of a tower at a point on the ground is 30° . What will be the angle of elevation, if the height of the tower is tripled?

- a. 30° b. 90° c. 60° d. 45°

65. The largest numbers that divides 70 and 125 leaving remainders 5 and 8 respectively is

- a. 13 b. 9 c. 3 d. 585

66. If three points $(0,0), (3,\sqrt{3}), (3,\lambda)$ form an equilateral triangle, then $\lambda =$

- a. 2 b. -3 c. -4 d. None of these

67. PQ is a tangent drawn from a point P to a circle with centre O and QOR is the diameter of the circle such that $\angle POR = 120^\circ$, then $\angle OPQ$ is

- a. 60° b. 45° c. 30° d. 90°

68. If mode of a series exceeds its mean by 12, then mode exceeds the median by

- a. 4 b. 8 c. 6 d. 10

69. If $\frac{5+9+13+\dots+n \text{ terms}}{7+9+11+\dots \text{to } (n+1) \text{ terms}} = \frac{17}{16}$, then n is

- a. 8 b. 7 c. 10 d. 11

70. In a $\triangle ABC$, $\angle A = 90^\circ$, $AB = 5$ cm and $AC = 12$ cm. If $AD \perp BC$, then $AD =$ _____

- a. $\frac{13}{2}$ cm b. $\frac{60}{13}$ cm c. $\frac{13}{60}$ cm d. $\frac{2\sqrt{15}}{13}$ cm

71. Self - consciousness (the awareness of himself) is the property of

- a. All living organism c. Eukaryotes only
b. Prokaryotes only d. Human beings only

72. Which of the following is least effective in photosynthesis?

- a. Sunlight b. Red light c. Blue light d. Green light

73. Auxanometer is required for

- a. Studying rate of transpiration c. Finding out rate of photosynthesis
b. Measuring rate of respiration d. Calculating rate of growth

74. Enzymes are basically made of

- a. Nucleic acids b. Proteins c. Fats d. Vitamins

75. A woman may develop beard and moustaches due to

- a. Hypersecretion of adrenal cortex c. Hypersecretion of adrenaline
b. Hypersecretion of thyroxine d. Hyposecretion of thyroxine

76. Part of tongue that gives feeling of sweetness is

- a. Tip b. Lateral edges c. Middle part d. Posterior part

77. Exclusive holozoic nutrition is seen in

- a. Housefly b. Spider c. Man d. Shark

78. The life of the erythrocytes in mammalian blood is about
a. 120 days b. 150 days c. 190 days d. 180 days
79. Assertion: In protists and Monerans, the cell division is itself a mode of reproduction.
Reason: In protists and Monerans, the organisms or the parent cell divides into two to give rise to new individuals.
a. If both assertion and reason are true and the reason is the correct explanation of the assertion.
b. If both assertion and reason are true but reason is not the correct explanation of the assertion.
c. If assertion is true but reason is false
d. If both assertion and reason are false
80. Oil reserve of groundnut is present in
a. Embryo b. Cotyledons c. Endosperm d. underground tubers
81. The second trophic level in the lake is
a. Zooplankton b. Phytoplankton c. Benthos d. Fishes
82. Which one is primary sex organ?
a. Scrotum b. Penis c. Testis d. Prostate
83. 'Origin of species' was written by
a. Oparin b. Weismann c. Lamarck d. Darwin
84. Which is not a pyrimidine?
a. Guanine b. Thymine c. Uracil d. Cytosine
85. Muscular contractions of alimentary canal are
a. circulation b. Deglutition c. Churning d. Peristalsis
86. A molecule of haemoglobin carries how many oxygen molecules
a. 1 b. 2 c. 3 d. 4
87. Male and female reproductive structures of the angiosperms are
a. Carpel and pistil respectively
b. Pistil and stamen respectively
c. Gynoecium and androecium respectively
d. Androecium and gynoecium respectively
88. Ozone, prevents the entry of
a. Infrared rays b. Visible rays c. UV rays d. X – rays

89. The mechanism of breakdown of food materials within the cell to release energy and

the trapping of this energy for synthesis of ATP is called

- a. Fermentation b. Glycolysis c. Cellular respiration d. Breathing

90. The food mixed thoroughly with acidic gastric juices of the stomach by the churning movement of its muscular wall and is called the

- a. Bolus b. Chyle c. Chyme d. Chylomicron

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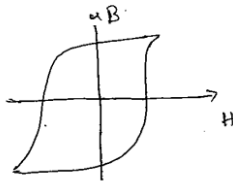
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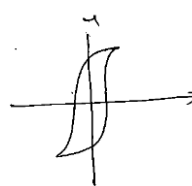


1. A particle starting from rest with constant acceleration travels a distance x in first $2s$ and distance y is next $2s$, then
 - a. $y = x$
 - b. $y = 2x$
 - c. $y = 3x$
 - d. $y = 4x$
2. A wave of frequency 5 Hz is propagating through a medium. What will be the time taken by a particle at the rest to come to mean position
 - e. 0.5 s
 - f. 0.05 s
 - g. 5 s
 - h. 0.2 s
3. Hysteresis loops for two magnetic material A and B are given below

A



B



Which materials are suitable for making electromagnets

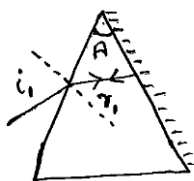
- a. A
 - b. B
 - c. No difference between A and B
 - d. Both A and B can't use as electromagnet
4. By mistake a voltmeter is connected in series and an ammeter in parallel when the circuit is switched on
 - a. Both ammeter and voltmeter will be damaged
 - b. Neither the ammeter nor the voltmeter will be damaged
 - c. Only the ammeter will be damaged
 - d. Only the voltmeter will be damaged
 5. A battery of 10 V and internal resistance $3\ \Omega$ is connected to a resistor. The current in the circuit is 0.5 A . The voltage drop across the resistor is
 - e. 1.5 V
 - f. 8.5 V
 - g. 10 V
 - h. 0 V
 6. If air resistance is constant for vertically thrown body. Then
 - a. The time of ascent $>$ time of descent
 - b. The time of ascent $<$ time of descent
 - c. The time of ascent $=$ time of descent
 - d. The time of ascent \geq time of descent

7. Light travelling in positive x – direction, after reflection, reflected ray makes an angle 30° with negative y – axis. The angle of deviation is
 a. 30° b. 50° c. 120° d. 60°
8. A transparent cube of 0.21 m edge contains a small air bubble. Its apparent distance when viewed through one face of the cube is 0.1 m and when viewed from the opposite face is 0.04 m. The actual distance of the bubble from the second face of the cube is
 e. 0.05 m f. 0.04 m g. 0.06 m h. 0.17 m
9. If a 30 V, 90 W bulb is to be worked in 120 V line, the resistance to be connected in series with the bulb is
 e. 20Ω f. 10Ω g. 40Ω h. 30Ω

10. Principle of calorimetry is

- e. Heat lost = heat gained g. Heat gained = 0
 f. Heat lost = 0 h. Heat capacity = 0

11. In the diagram, find the angle of prism. If $i_1 = 45^\circ$, $r_1 = 30^\circ$



- a. 45° b. 75° c. 60° d. 30°

12. Two wires of the same dimensions but resistivities ρ_1 and ρ_2 are connected in series. The equivalent resistivity of the combination

- a. $\frac{\rho_1 + \rho_2}{2}$ b. $\rho_1 + \rho_2$ c. $(\rho_1 + \rho_2)2$ d. $\sqrt{\rho_1 + \rho_2}$

13. Focal length of convex lens is 15 cm. When exactly half of the lens is covered with non transparent material, then new focal length will be

- e. 30 cm f. 10 cm g. 45 cm h. 15 cm

14. Find direction of magnetic field at X when current direction at Y is outward.



- e. Inward f. Outward g. Up h. Down

15. A body of mass 1 kg is thrown upwards with a velocity 20 m/s. It momentarily comes to rest after attaining a height of 18 m. How much energy is lost due to air friction. (Take $g = 10 \text{ m/s}^2$)

- e. 20 J f. 30 J g. 10 J h. 40 J

16. Specific heat capacity of water is

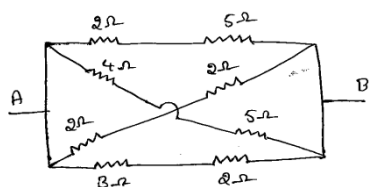
e. $4186 \text{ J Kg}^{-1} \text{ K}^{-1}$

g. $1200 \text{ J Kg}^{-2} \text{ K}^{-1}$

f. $2186 \text{ J Kg}^{-1} \text{ K}^{-1}$

h. $200 \text{ J Kg}^{-1} \text{ K}^{-1}$

17. Find the effective resistance between A and B



a. 1.42Ω

b. 1260Ω

c. 25Ω

d. 50Ω

18. If n equal resistors are first connected in series and then connected in parallel. The ratio of the maximum to minimum resistance obtained in two cases is

a. $n : 1$

b. $n^2 : 1$

c. $1 : n^2$

d. $1 : n$

19. Inside diamagnetic material number of magnetic field lines

e. Greater than outside

g. Less than outside

f. Equal to outside

h. No magnetic field lines

20. Find the wavelength of waves having frequency 480 Hz with velocity of sound is 340 m/s ?

a. 0.71 m

b. 0.61 m

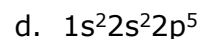
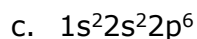
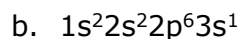
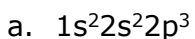
c. 0.51 m

d. 0.41 m

21. The molecule which has zero dipole moment is



22. With which of the following electronic configuration an atom has the lowest ionization enthalpy?



23. A covalent molecule AB_3 has pyramidal structure. The number of lone pair and bond pair electrons in the molecule are respectively

e. 0 and 4

f. 3 and 1

g. 1 and 3

h. 2 and 2

24. Dipole – induced dipole interactions are present in which of the following pairs?

e. HCl and He atoms

g. SiF_4 and He atoms

f. H_2O and alcohol

h. Cl_2 and CCl_4

25. Which one is correct statement for zeolite?

a. They are aluminosilicates

b. Hydrated zeolites are used as ion exchangers in hardening of soft water

c. ZSM – 5 is used to convert gasoline to alcohol

d. All of these

26. $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$. Which is the correct statement about this reaction ?
- H_2O_2 decomposition involves both oxidation and reduction
 - H_2O_2 decomposition is Oxidation only
 - H_2O_2 decomposition is reduction only
 - H_2O_2 decomposition neither oxidation nor reduction
27. At its melting point ice is lighter than water because
- H_2O molecules are more closely packed in solid state
 - Ice crystals have hollow hexagonal arrangement of H_2O molecules
 - On melting of ice the H_2O molecule shrinks in size
 - Ice forms mostly heavy water on first melting
28. Which of the following sulphides when heated strongly in air gives the corresponding metal?
- Cu_2S
 - CuS
 - Fe_2S_3
 - FeS
29. Permanent hardness due to Mg^{2+} ions is best removed by
- $\text{Ca}(\text{OH})_2$
 - Na_2CO_3
 - $\text{Na}_2\text{CO}_3 + \text{Ca}(\text{OH})_2$
 - None of these
30. NaOH is manufactured by electrolysis of brine solution. The products of the reaction are
- Cl_2 and H_2
 - Cl_2 and Na-Hg
 - Cl_2 and Na
 - Cl_2 and O_2
31. Modern atomic weight scale is based on
- $\text{H} - 1$
 - $\text{C} - 12$
 - $\text{C} - 14$
 - $\text{C} - 16$
32. The following reactions take place in the blast furnace in the preparation of impure iron. Identify the reaction pertaining to the formation of the slag
- $2\text{C}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{CO}(\text{g})$
 - $\text{CaO}(\text{s}) + \text{SiO}_2(\text{s}) \rightarrow \text{CaSiO}_3(\text{s})$
 - $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO}(\text{g}) \rightarrow 2\text{Fe}(\text{s}) + 3\text{CO}_2(\text{g})$
 - $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
33. Household gaseous fuel (LPG) mainly contains
- CH_4
 - C_2H_2
 - C_2H_4
 - C_4H_{10}
34. What is the hybridization of carbon in diamond?
- SP
 - SP^2
 - SP^3
 - SP^3d
35. Which of the following metal is found in native state
- Al
 - Cu
 - Fe
 - Mg
36. If a saturated solution is heated, it
- Changes to unsaturation
 - Changes to super saturation
 - Remains same
 - Till 50°C , changes to unsaturation and then super saturation

37. Lewis acid character of boron trihalides is as follows
- e. $\text{Bl}_3 > \text{BBr}_3 > \text{BCl}_3 > \text{BF}_3$ g. $\text{BCl}_3 > \text{BF}_3 > \text{BBr}_3 > \text{Bl}_3$
 f. $\text{BF}_3 > \text{BCl}_3 > \text{BBr}_3 > \text{Bl}_3$ h. $\text{Bl}_3 > \text{BBr}_3 < \text{BF}_3 < \text{BCl}_3$
38. 4 g H_2 , 32 g O_2 , 14 g N_2 and 11 g CO_2 are taken in a bulb of 500 ml. Which one of these has maximum active mass?
- a. H_2 b. O_2 c. N_2 d. CO_2
39. Reaction between following pairs will produce by hydrogen except
- e. $\text{Cu} + \text{HCl}$ f. $\text{Fe} + \text{H}_2\text{SO}_4$ g. $\text{Mg} + \text{Steam}$ h. $\text{Na} + \text{alcohol}$
40. When the temperature is raised through 10°C the volume is increased by $\frac{1}{273}$ times of the original volume. This is
- a. Boyle's Law b. Charles' Law c. Avogadro Law d. Graham's Law
41. Two persons are 'a' metres apart and the height of one is double that of the other. If from the middle point of the line joining their feet, an observer finds the angular elevation of their tops to be complementary, then the height of the shorter post is
- a. $\frac{a}{4}$ b. $\frac{a}{\sqrt{2}}$ c. $a\sqrt{2}$ d. $\frac{a}{2\sqrt{2}}$
42. The next term of the AP $\sqrt{7}, \sqrt{28}, \sqrt{63}, \dots$
- a. $\sqrt{70}$ b. $\sqrt{84}$ c. $\sqrt{97}$ d. $\sqrt{112}$
43. If the equation $x^2 - bx + 1 = 0$ has no real roots, then
- a. $-3 < b < 3$ b. $-2 < b < 2$ c. $b > 2$ d. $b < -2$
44. The probability that a non-leap year has 53 Sundays is
- a. $\frac{2}{7}$ b. $\frac{5}{7}$ c. $\frac{6}{7}$ d. $\frac{1}{7}$
45. PQ is a tangent drawn from a point P to a circle with centre O and QOR is the diameter of the circle such that $\angle POR = 120^\circ$, then $\angle OPQ$ is
- e. 60° f. 45° g. 30° h. 90°
46. If $\frac{x \operatorname{cosec}^2 30^\circ \sec^2 45^\circ}{8 \cos^2 45^\circ \sin^2 60^\circ} = \tan^2 60^\circ - \tan^2 30^\circ$, then x is
- e. 1 f. -1 g. 2 h. 0
47. If $\sec \theta + \tan \theta = x$, then $\sec \theta$
- a. $\frac{x^2+1}{x}$ b. $\frac{x^2+1}{2x}$ c. $\frac{x^2-1}{2x}$ d. $\frac{x^2-1}{x}$
48. If α, β, γ are the zeros of the polynomial $f(x) = ax^3 + bx^2 + cx + d$ then $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} =$
- e. $-\frac{b}{a}$ f. $\frac{c}{a}$ g. $-\frac{c}{a}$ h. $-\frac{c}{a}$
49. A bag contains three green marbles, four blue marbles and two orange marbles. If a marble is picked at random, then the probability that it is not an orange marble is
- e. $\frac{1}{4}$ f. $\frac{1}{3}$ g. $\frac{4}{9}$ h. $\frac{7}{9}$

50. The sum of the exponents of the prime factors in the prime factorization of 196 is
 a. 1 b. 2 c. 4 d. 6
51. If the area of a circle is equal to the sum of the area of two circles of diameters 10 cm and 24 cm, then diameter of the larger circle (in cm) is
 a. 34 b. 26 c. 17 d. 14
52. The distance between the points $(\cos \theta, \sin \theta)$ and $(\sin \theta, -\cos \theta)$ is
 a. $\sqrt{3}$ b. $\sqrt{2}$ c. 2 d. 3
53. Let S_n denote the sum of 'n' terms of an AP whose first term is 'a'. If the common difference 'd' is given by $d = S_n - kS_{n-1} + S_{n-2}$, then k is
 a. 1 b. 2 c. 3 d. None of these
54. If the LCM of a and 18 is 36 and HCF of a and 18 is 2, then a = _____
 e. 2 f. 3 g. 4 h. 1
55. The mean of first n odd natural numbers is
 a. $\frac{n+1}{2}$ b. $\frac{n}{2}$ c. n d. n^2
56. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then
 a. $k < 4$ b. $k > 4$ c. $k \geq 4$ d. $k \leq 4$
57. If $\frac{5+9+13+ \dots + n \text{ terms}}{7+9+11+ \dots \text{to } (n+1) \text{ terms}} = \frac{17}{16}$, then n is
 a. 8 b. 7 c. 10 d. 11
58. If the radius of a circle is diminished by 10%, then its area is diminished by
 a. 10 % b. 19 % c. 20 % d. 36 %
59. $\frac{\cot \theta}{\cot \theta - \cot 3\theta} + \frac{\tan \theta}{\tan \theta - \tan 3\theta}$ is equal to
 e. 0 f. 1 g. -1 h. 2
60. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the side of 3 cm to form a cone. The volume of the cone so formed is
 a. $15 \pi \text{ cm}^3$ b. $12 \pi \text{ cm}^3$ c. $16 \pi \text{ cm}^3$ d. $20 \pi \text{ cm}^3$
61. A fraction becomes $\frac{4}{5}$, if 1 is added to both numerator and denominator. If, however 5 is subtracted from both numerator and denominator, the fraction becomes $\frac{1}{2}$. Then the fraction is
 a. $\frac{9}{7}$ b. $\frac{3}{7}$ c. $\frac{7}{9}$ d. $\frac{5}{9}$
62. The value of $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ$ is
 a. -1 b. 0 c. 1 d. None of these
63. The ratio of the outer and inner perimeters of a circular path is 23 : 22. If the path is 5 meters wide, the diameter of the inner circle is
 a. 55 m b. 110 m c. 220 m d. 230 m

64. The coordinates of the point P dividing the line segment joining the points A(1,3) and B(4,6) in the ratio 2 : 1 are
- a. (2,4) b. (3,5) c. (4,2) d. (5,3)
65. The polynomial $px^2 + qx + rx^4 + 5$ is of type
- e. Linear f. Quadratic g. Cubic h. Biquadratic
66. If PT is tangent drawn from a point P to a circle touching it at T and O is the centre of the circle, then $\angle OPT + \angle POT =$
- a. 30° b. 60° c. 90° d. 180°
67. ABC is a right angled triangle at A. A circle is inscribed in it, the length of the two sides containing the right angle are 6 cm and 8 cm then the radius of circle is _____
- e. 6 cm f. 8 cm g. 14 cm h. 2 cm
68. If $f(x) = ax^2 + bx + c$ has no real zeros and $a + b + c < 0$, then
- a. $c = 0$ b. $c > 0$ c. $c < 0$ d. None of these
69. A rectangular sheet of paper 40 cm x 22 cm is rolled to form a hollow cylinder of height 40 cm. The radius of the cylinder is
- e. 3.5 cm f. 7 cm g. $\frac{80}{7}$ cm h. 5 cm
70. The hour hand of a clock is 6 cm long. The area swept by it between 11.20 am and 11.55 am is
- e. 2.75 cm^2 f. 5.5 cm^2 g. 11 cm^2 h. 10 cm^2
71. Which one respire through gills?
- e. Crocodile f. Whale g. Frog h. Prawn
72. Shock movements of leaves of sensitive plants Mimosa pudica are
- a. Themonasty b. Seismonasty c. Hydrotropism d. Chemonasty
73. Water lost through transpiration is
- e. Pure water g. Rich in dissolved salts
f. Rich in organic solutes h. All of these
74. Hydroponics is
- a. Nutrient less culture c. Soilless culture
b. Water less culture d. None of these
75. Which one of the following is not the function of placenta?
- a. Facilitates removal of carbon dioxide and waste material from embryo
b. Secretes oxytocin during parturition
c. Facilitates supply of oxygen and nutrients to embryo
d. Secretes estrogen

76. Double fertilization is fusion of
- Two eggs
 - Two eggs and polar nuclei with pollen nuclei
 - One male gamete with egg and other with synergid
 - One male gamete with egg and other with secondary nucleus
77. Genetic material without nuclear membrane is found in
- Bacteria and Mycoplasma
 - Cyanobacteria and Bacteria
 - Archaeobacteria and Blue green algae
 - All of these
78. Infertility can occur in both sexes due to deficiency of
- Oxytocin
 - Prolactin
 - LH
 - FSH
79. Gastric juice of infants contains
- Pepsinogen, Lipase, Rennin
 - Amylose, Rennin, Pepsinogen
 - Maltose, Pepsinogen, rennin
 - Nuclease, Pepsinogen, Lipase
80. Blood calcium level is lowered by deficiency of
- Parathormone
 - Thyroxine
 - calcitonin
 - Both calcitonin and parathormone
81. Which one of the following fruits is parthenocarpic?
- Apple
 - Jackfruit
 - Banana
 - Brinjal
82. Fermentation takes place under anaerobic conditions in
- Many prokaryotes
 - Unicellular eukaryotes
 - Germinating seeds
 - All of these
83. The backbone of the DNA is formed by
- Sugar – base – sugar chain
 - Base – phosphate – sugar chain
 - Sugar – phosphate – sugar chain
 - Base – phosphate – base chain
84. Gall bladder takes part in
- Secretion of bile
 - Storage of bile
 - Formation of bile salts
 - Formation of enzymes
85. Cold blooded animal with a single circulation is
- Mammal
 - Amphibian
 - Reptile
 - Fish
86. The function of ovary is
- To produce female gamete
 - To provide the site for fertilization
 - To provide the site for implantation
 - To produce steroid hormones
- A & B
 - A, B & D
 - A, B & C
 - A & D
 -

87. Process by which insecticide like DDT reach man is

- a. Bioaccumulation
- b. Biomagnification
- c. Bioremediation
- d. Eutrophication

88. Most abundant and least abundant WBC's are

- a. Lymphocytes and monocytes respectively
- b. Neutrophils and Basophils respectively
- c. Eosinophils and monocyte respectively
- d. Neutrophils and eosinophils respectively

89. Deficiency of Vitamin A causes

- a. Cataract
- b. Myopia
- c. Hypermetropia
- d. Night blindness

90. In diabetes mellitus the patient drinks more water as there is urinary loss of

- e. Salt
- f. Insulin
- g. Protein
- h. Glucose

😊😊😊😊😊 **Best of Luck** 😊😊😊😊😊

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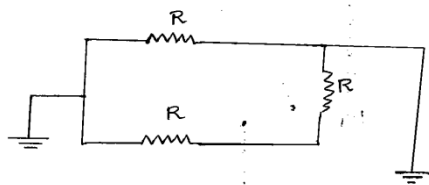
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PRATIBHA PRAVEENA EXAM 2018 - 19



1. Inside battery electrons are moving from
 - e. Higher to lower potential end
 - f. Lower to higher potential end
 - g. Electrons are not flowing inside battery
 - h. None of these
2. When light travels from denser medium to rarer medium _____ will remain same
 - e. Frequency
 - f. Wavelength
 - g. Velocity
 - h. All of these
3. When luminous point source is present inside water. From water to air light will pass through
 - e. Circular area
 - f. Rectangular area
 - g. Cubical area
 - h. Throughout the surface of water
4. Body is dropped from a height where its potential energy is 20 J. If mass of the body is 0.2 kg, find the velocity when it reaches the earth surface
 - e. 10 m/s²
 - f. $10\sqrt{2}$ m/s²
 - g. $5\sqrt{2}$ m/s²
 - h. $15\sqrt{2}$ m/s²
5. Conductors can be charged by three methods that are:
 - i. Friction
 - ii. Conduction
 - iii. InductionAn insulator can be charged by
 - e. Only friction
 - f. Only conduction
 - g. Only Induction
 - h. Both conduction and friction
6. A ray of light incident on the horizontal surface of a glass slab at 60° just grazes the adjacent vertical surface after refraction. Find the critical angle
 - a. $\tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$
 - b. $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$
 - c. $\sin^{-1}\frac{1}{2}$
 - d. $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$

7. Find the equivalent resistance between A and B in the following circuit



- e. $\frac{R}{2}$ f. $2R$ g. $R + 2R$ h. Zero

8. Bending of light will be more when light travels from

- a. Glass to air c. Water to air
b. Glass to water d. Diamond to air

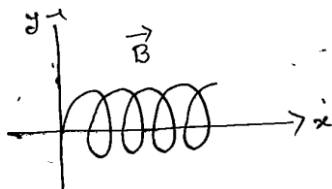
9. Principle of "method of mixture" is based

- e. Conservation of energy
f. Conservation of momentum
g. Conservation of number of particle
h. Conservation of linear momentum

10. If we combine one convex lens and concave lens of same radii of curvature and having same refractive index. The focal length of the combination will be

- i. Zero k. Reduces to half of focal length of convex lens
j. Infinity l. Sum of focal lengths of both lenses

11. Diagram shows the path of the charged particle in uniform magnetic field. The angle between the velocity of charged particle and direction of magnetic field may be



- e. 90° f. zero g. 50° h. 180°

12. A convex lens V having power P is cut into two parts and combined as shown in the figure. The power of the combination A and B will be



- i. Zero in both A & B k. Zero in A and $2P$ in B
j. $2P$ in A and zero in B l. $2P$ in both A & B

13. A battery has an emf 12 V. If the internal resistance of the battery is 0.4Ω . What is the maximum current that can be drawn from the battery?
- e. 10 A f. 20 A g. 30 A h. 40 A
14. A lift is moving down with acceleration a . A man in the lift drops a ball inside the lift. The acceleration of the ball as observed by the man in the lift and a man standing stationary on the ground are respectively
- i. g, g j. $g - a, g - a$ k. $g - a, g$ l. a, g
15. Which of the following statement (S) false for a particle moving in a circle with constant angular speed
- e. The acceleration vector points to the centre of the circle
 f. Velocity vector points to the centre of the circle
 g. Velocity vector is tangent to the circle
 h. Acceleration vector is tangent to the circle
16. A body projected vertically upwards with a velocity returns to the starting point in 4s. If g is 10 m/s^2 , the value of u is
- i. 10 m/s^2 j. 5 m/s^2 k. 4 m/s^2 l. 20 m/s^2
17. 1 calorie = _____ joules
- a. 4.2 b. 3.2 c. 5.2 d. 1.2
18. In primary rainbow red rays make an angle _____ with sun rays
- e. 25° f. 35° g. 90° h. 42°
19. The refractive index of glass is 1.5. For light whose wavelength in vacuum is 600 nm. What is the wavelength of this light when it passes through glass.
- a. 400 nm b. 700 nm c. 500 nm d. 600 nm
20. A straight wire of mass 100g and length 1m carries a current of 2A. It is suspended in mid-air by uniform horizontal magnetic field as in the figure. What is the magnitude of the magnetic field.



- e. 2.8 T f. 3.8 T g. 0.49 T h. 3.2 T
21. Oxidation state shown by group 13 elements is
- a. +1 and +3 b. +1, +2 and +3 c. +2, +3 and +4 d. +1 and +4
22. Which one of the following compounds gives methane on treatment with water?
- a. Al_4C_3 b. CaC_2 c. VC d. SiC

23. For a real gas, Z shows
- $Z < 1$, gas is less compressible
 - $Z > 1$, gas is more compressible
 - $Z = \infty$, for an ideal gas
 - $PV \neq nRT$, for real gas
24. The general formula of a cycloalkane is
- C_nH_n
 - C_nH_{2n}
 - C_nH_{2n-2}
 - C_nH_{2n+2}
25. The compound that is not a Lewis acid is
- BF_3
 - $AlCl_3$
 - PCl_3
 - $SnCl_4$
26. Which of the following compound is used in the artificial ripening of fruits?
- Ethylene
 - Acetylene
 - Ethane
 - Methane
27. Assertion : Ionic compounds tend to non – volatile
Reason : The intermolecular forces in these compounds are weak.
- Both assertion and reason are correct and reason is the correct explanation of the assertion.
 - Both assertion and reason are correct, but reason is not correct explanation of the assertion.
 - Assertion is correct but reason is incorrect.
 - Assertion is incorrect but reason is correct.
28. The amount of oxalic acid (molecular weight = 126) required to prepare 100 ml of 0.2 M solution is :
- 1.26 g
 - 2.52 g
 - 0.63 g
 - 5.04 g
29. An alloy which does not contain copper is
- Solder
 - Bronze
 - Brass
 - Bell metal
30. Calculate the initial volume if a sample of gas at 75 °C is changed to 1.50 L at 25 °C at constant pressure.
- 1.75 L
 - 1.95 L
 - 1.85 L
 - 1.65 L
31. The first ionization potentials (eV) of N and O respectively are
- 8.29 , 8.29
 - 11.32 , 11.32
 - 8.29 , 11.32
 - 11.32 , 8.21
32. Which one of the following orders is not in accordance with the property stated against it?
- $F_2 > Cl_2 > Br_2 > I_2$: bond dissociation energy
 - $F_2 > Cl_2 > Br_2 > I_2$: oxidizing power
 - $HI > HBr > HCl > HF$: acidic property in water
 - $F_2 > Cl_2 > Br_2 > I_2$: electronegativity

33. Eka – aluminium and Eka – silicon are known as
- Gallium and Germanium
 - Aluminium and Silicon
 - Iron and Sulphur
 - Boron and Technitium
34. The angular momentum of electron in d orbital is equal to
- $2\sqrt{3} h$
 - $0 h$
 - $\sqrt{6} h$
 - $\sqrt{2} h$
35. Which of the following is not a mineral of iron?
- Magnetite
 - Siderite
 - Smithsonite
 - Limonite
36. 5.6 L of oxygen at NTP is equivalent to –
- 1 mole
 - $\frac{1}{2}$ mole
 - $\frac{1}{4}$ mole
 - $\frac{1}{8}$ mole
37. Bleaching action of H_2O_2 is due to its :
- Oxidising nature
 - Reducing nature
 - Acidic nature
 - Thermal instability
38. Composition of bauxite is
- Al_2O_3
 - $Al_2O_3 \cdot H_2O$
 - $Al_2O_3 \cdot 2H_2O$
 - $Al_2O_3 \cdot 3H_2O$
39. Pure water can be obtained from sea water by
- Centrifugation
 - Plasmolysis
 - Sedimentation
 - Reverse osmosis
40. Which of the following oxides is not expected to react with sodium hydroxide
- BeO
 - B_2O_3
 - CaO
 - SiO_2
41. If $ax^2 + bx + c = 0$ has equal roots, then $c =$
- $-\frac{b}{2a}$
 - $\frac{b}{2a}$
 - $-\frac{b^2}{4a}$
 - $\frac{b^2}{4a}$
42. Two equal circles touch each other externally at C and AB is a common tangent to the circles. Then $\angle ACB =$
- 60°
 - 45°
 - 30°
 - 90°
43. If the mean of 6, 7, x , 8, y , 14 is 9, then
- $x + y = 21$
 - $x + y = 19$
 - $x - y = 19$
 - $x - y = 21$
44. If one root of the polynomial $f(x) = 5x^2 + 13x + k$ is reciprocal of the other, then the value of k is
- 0
 - 5
 - $\frac{1}{6}$
 - 6
45. If the sums of 'n' terms of two arithmetic progressions are in the ratio $\frac{3n+5}{5n+7}$, then their n^{th} terms are in the ratio
- $\frac{3n-1}{5n-1}$
 - $\frac{3n+1}{5n+1}$
 - $\frac{5n+1}{3n+1}$
 - $\frac{5n-1}{3n-1}$

46. If $3 \cos \theta = 5 \sin \theta$, then the value of $\frac{5 \sin \theta - 2 \sec^3 \theta + 2 \cos \theta}{5 \sin \theta + 2 \sec^3 \theta - 2 \cos \theta}$ is
- a. $\frac{271}{979}$ b. $\frac{316}{2937}$ c. $\frac{542}{2937}$ d. None of these
47. A bag contains three green marbles, four blue marbles and two orange marbles. If a marble is picked at random, then the probability that it is not an orange marble is
- i. $\frac{1}{4}$ j. $\frac{1}{3}$ k. $\frac{4}{9}$ l. $\frac{7}{9}$
48. If ABC is an isosceles triangle and D is a point on BC such that $AD \perp BC$, then
- a. $AB^2 - AD^2 = BD \cdot DC$ c. $AB^2 + AD^2 = BD \cdot DC$
b. $AB^2 - AD^2 = BD^2 - DC^2$ d. $AB^2 + AD^2 = BD^2 - DC^2$
49. If $x = 1$ is a common root of the equations $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then $ab =$
- e. 3 f. 3.5 g. 6 h. -3
50. The smallest number by which $\sqrt{27}$ should be multiplied so as to get a rational number
- a. $\sqrt{27}$ b. $3\sqrt{3}$ c. $\sqrt{3}$ d. 3
51. If $x = 1$ is a common root of $ax^2 + ax + 2 = 0$ and $x^2 + x + b = 0$, then $ab =$
- i. 1 j. 2 k. 4 l. 3
52. AP and PQ are tangents drawn from a point A to a circle with centre O and radius 9 cm. If $OA = 15$ cm then $AP + AQ =$
- e. 12 cm f. 18 cm g. 24 cm h. 36 cm
53. If $(x, 2), (-3, -4), (7, -5)$ are collinear, then $x =$
- e. 60 f. 63 g. -63 h. -60
54. If 35 is removed from the data : 30,34,35,36,37,38,39,40, then the median increases by
- e. 2 f. 1.5 g. 1 h. 0.5
55. The polynomial which when divided by $-x^2 + x - 1$ gives a quotient $x - 2$ and remainder 3 is
- a. $x^3 - 3x^2 + 3x - 5$ c. $-x^3 + 3x^2 - 3x + 5$
b. $-x^3 - 3x^2 - 3x - 5$ d. $x^3 - 3x^2 - 3x + 5$
56. The first and last term of an A.P are 'a' and 'l' respectively. If S is the sum of all the terms of the A.P and the common difference is given by $\frac{l^2 - a^2}{K - (l+a)}$, then K is
- e. S f. 2S g. 3S h. None of these
57. Sum of 'n' terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \dots$
- a. $\frac{n(n+1)}{2}$ b. $2n(n+1)$ c. $\frac{n(n+1)}{\sqrt{2}}$ d. 1

58. The ratio of the outer and inner perimeters of a circular path is 23 : 22. If the path is 5 meters wide, the diameter of the inner circle is
- a. 55 m b. 110 m c. 220 m d. 230 m
59. A number x is chosen at random from the numbers $-3, -2, -1, 0, 1, 2, 3$ the probability that $|x| < 2$ is
- a. $\frac{5}{7}$ b. $\frac{2}{7}$ c. $\frac{3}{7}$ d. $\frac{1}{7}$
60. The different coins are tossed simultaneously. The probability of getting at least one head is
- a. $\frac{1}{4}$ b. $\frac{1}{8}$ c. $\frac{3}{4}$ d. $\frac{7}{8}$
61. The length of the shadow of a tower standing on level ground is found to be $2x$ meters longer when the sun's elevation is 30° than when it was 45° . The height of the tower in metres is
- a. $(\sqrt{3} + 1)x$ b. $(\sqrt{3} - 1)x$ c. $2\sqrt{3}x$ d. $3\sqrt{2}x$
62. A sphere of radius 6 cm is dropped into a cylindrical vessel partly filled with water. The radius of the vessel is 8 cm. If the sphere is submerged completely, then the surface of the water rises by
- a. 4.5 cm b. 3 cm c. 4 cm d. 2.5 cm
63. The coordinates of the point P dividing the line segment joining the points A(1,3) and B(4,6) in the ratio 2 : 1 are
- i. (2,4) j. (3,5) k. (4,2) l. (5,3)
64. If zeros of the polynomial $f(x) = x^3 - 3px^2 + qx - r$ are in AP, then
- a. $2p^3 = pq - r$ b. $2p^3 = pq + r$ c. $p^3 = pq - r$ d. None of these
65. If $\sqrt{5}$ and $-\sqrt{5}$ are two zeroes of the polynomial $x^3 + 3x^2 - 5x - 15$, then its third zero is
- e. 3 f. -3 g. 5 h. -5
66. The polynomial $px^2 + qx + rx^4 + 5$ is of type
- a. Linear b. Quadratic c. Cubic d. Biquadratic
67. The value of $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ$ is
- e. -1 f. 0 g. 1 h. None of these
68. $\frac{\cot \theta}{\cot \theta - \cot 3\theta} + \frac{\tan \theta}{\tan \theta - \tan 3\theta}$ is equal to
- i. 0 j. 1 k. -1 l. 2
69. If the radius of a circle is diminished by 10%, then its area is diminished by
- a. 10 % b. 19 % c. 20 % d. 36 %
70. A number is selected at random from the numbers 1 to 30. The probability that it is a prime number is

- a. $\frac{2}{3}$ b. $\frac{1}{6}$ c. $\frac{1}{3}$ d. $\frac{11}{30}$

71. Chlorosis occurs when plants are grown in

- e. Shade f. Strong sunlight g. Fe – free freedom h. Dark

72. Master endocrine gland is

- e. Pituitary f. Thyroid g. Parathyroid h. Pineal

73. On seeing a tiger, the heart beat and blood pressure increase due to release of hormone

- e. Adrenaline f. Thyroxine g. Parathormone h. Corticoides

74. The absorbed substances finally reach the tissues which utilize them for their activities. This process is called

- e. Defecation f. Metabolism g. Catabolism h. Assimilation

75. Emulsification of fats by bile juice takes place in

- i. Liver j. Stomach k. Oesophagus l. Duodenum

76. Muscles attached to diaphragm contract during inspiration to make it

- a. Flat b. Dome - shaped c. Concave d. Rotate

77. World environment day is

- a. 11th July b. 5th June c. 1st December d. 16th September

78. In Angiosperms, the sets of sexual reproduction is

- a. Seed b. Fruit c. Flower d. Embryo

79. Sexually transmitted disease affecting both males and female genitals which often damage eyes of babies born to infected mother

- a. Syphilis b. Gonorrhoea c. Hepatitis d. AIDS

80. Leaves are green because they

- e. Absorb green light
f. Do not absorb green light but reflect green light
g. Utilise green light
h. Absorb and reflect green light

81. Auxin synthesis occurs in

- a. Root/Shoot tips b. Cortex c. Xylem d. Phloem cells

82. Which of the following group do not include endocrine gland?

- a. Pituitary, Pineal, thyroid
b. Adrenal, parathyroid, thymus
c. pancreas, testis, ovary
d. liver, kidney, heart & gastrointestinal tract

83. First portion of small intestine is called

- a. Jejunum b. Ileum c. Duodenum d. Cystic duct

84. Which one secretes anticoagulant
a. Mast cells b. Nerve cells c. Adipose cells d. Plasma cells
85. Excretion of dilute urine is due to
a. More secretion of aldosterone c. Less secretion of glucagons
b. Less secretion of vasopressin d. More secretion of insulin
86. Assertion: In sexual reproduction, offsprings are not identical to the parents or amongst themselves.
Reason: Sexual reproduction involves fusion of male and female gametes.
a. If both assertion and reason are true and the reason is the correct explanation of the assertion.
b. If both assertion and reason are true but reason is not the correct explanation of the assertion.
c. If assertion is true but reason is false
d. If both assertion and reason are false
87. A large majority of flowering plants are pollinated by
a. Butterflies b. Bees c. Sunbirds d. Beetles
88. Ozone hole refers to
a. Hole in ozone layers
b. Reduction in thickness of ozone layer in stratosphere
c. Reduction of thickness of ozone in troposphere
d. Increased concentration of ozone
89. Homologous organs are
a. Wings of pigeon and butterfly c. Wings of pigeon and arms of humans
b. Wings of pigeon and housefly d. Wings of bat, housefly and butterfly
90. The two systems that jointly coordinate and regulate the physiological functions of body are
a. Neural system and circulatory system
b. Endocrine system and circulatory system
c. Endocrine system and neural system
d. Neural system and skeletal system

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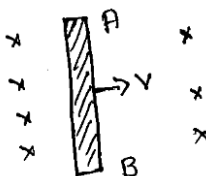
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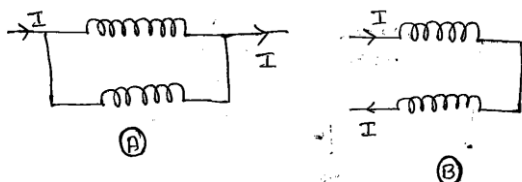
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- Which type of lens is used to correct Myopia
i. Concave j. Convex k. Plane l. Cylindrical
- In the case of refraction through glass slab if angle of incidence is 30° , what is the angle made by the emergent ray with normal (R.I of medium 1.5)
e. 30° f. 45° g. 50° h. 55°
- Unit of electric current is
i. Volt j. Cs^{-1} k. NC^{-1} l. Wb
- Conductor AB is moving in uniform magnetic field with constant velocity V as shown in the figure. Inside the conductor electrons will experience force in the direction



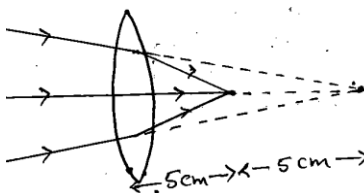
- e. A to B f. B to A g. Perpendicular to AB h. Force is zero
- The strongest force in the nature is
m. Gravitational force o. Electromagnetic field
n. Weak nuclear force p. Strong nuclear force
 - In which case mutual inductantion is more



- e. A g. Mutual inductance is same is A and B
f. B h. Mutual inductance is zero in both the cases
- A particle starts its motion from rest under the action of a constant force. If the distance covered in first 10 second is s_1 and that covered in the first 20 second is s_2 , then
i. $s_2 = 3s_1$ j. $s_2 = 4s_1$ k. $s_2 = s_1$ l. $s_2 = 2s_1$

8. If 240 J of work is done in 2 minutes by a water pump then the power of the pump is
- i. 240 W j. 2 W k. 2.4 W l. 24 W

9. In the below diagram, object distance is



- i. 10 cm j. 5 cm k. Infinity l. 0.5 cm
10. Density of water is highest at
- m. 0° C n. 10° C o. 4° C p. 3° C

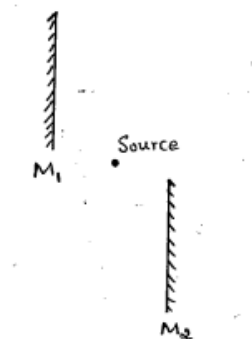
11. A ring shaped metal is allowed to expand by heating it. The hole will

- i. Expand
j. Contract
k. Expand or contract depending upon the width of the ring
l. Not change in size

12. A analog watch shows the time as 3 : 25. What will be the time that appears when seen through a plane mirror

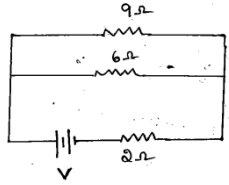
- i. 9 : 35 j. 3 : 25 k. 8 : 35 l. 1 : 35

13. If angle between two plane mirrors is zero and source is in between the plane mirror. Then infinite numbers of images are formed. Then in the below combination total number of images are



- e. Two f. Infinite g. One h. Three

14. In the given circuit power dissipated in the $9\ \Omega$ resistor is 36 W. Then potential difference across the $2\ \Omega$ resistor is



- a. 2 V b. 4 V c. 8 V d. 10 V

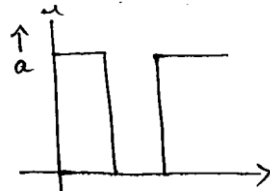
15. Light incidence normally to plane mirror. If mirror is rotated by an angle 30° then angle between the direction of reflected ray in normal incidence and after turning the mirror is

- e. 30° f. 60° g. 15° h. 45°

16. When Direct current is passed through a solenoid then length of the solenoid is

- a. Increases c. Remains same
b. Decreases d. Depends on the direction of current

17. Figure shows the acceleration – time graphs of a particle. Which of the following represents the corresponding velocity – time graph



- e. c.
f. d.

18. To hear an echo clearly, the minimum distance of the reflecting surface should be

- i. 34.4 cm j. 17.2 m k. 20 m l. 15 m

19. A thermos flask contains hot coffee. The flask is vigorously shaken. Then the temperature of the coffee will

- e. Rise g. Remain the same
f. Fall h. Fall below $^\circ\text{C}$

20. A pump can take out 700 kg of water per hour from a well 100 m deep. The power supplied to the pump, assuming its efficiency as 90 % is

- a. 216 W b. 517 W c. 2010 W d. 78 W
21. The element with highest electron affinity will belong to
 e. Period 2 , group 17 g. Period 2 , group 18
 f. Period 3 , group 17 h. Period 2 , group 1
22. Which of the following is a polar molecule?
 a. SiF₄ b. XeF₄ c. BF₃ d. SF₄
23. What is the value of electron gain enthalpy of Na⁺ if IE_1 of Na = 5.1 eV?
 i. -5.1 eV j. -10.2 eV k. +2.55 eV l. +10.2 eV
24. Stainless steel is an alloy of
 e. copper f. Nickel & Chromium g. Manganese h. Zinc
25. Oxidation numbers of A,B,C are +2 , +5 and -2 respectively. Possible formula of compound is
 a. A₂(BC₂)₂ b. A₃(BC₄)₂ g. A₂(BC₃)₂ h. A₃(B₂C)₂
26. Calgon is an industrial name given to :
 m. Normal sodium phosphate o. Sodium hexametaphosphate
 n. Sodium meta – aluminate p. Hydrated sodium aluminium silicate
27. The percentage of N₂ in urea is about
 i. 85 j. 46 k. 28 l. 18
28. For reaction , $2A + B \rightleftharpoons 2C$, $K = x$. Equilibrium constant for $C \rightleftharpoons A + \frac{1}{2} B$ will be
 m. x n. $\frac{x}{2}$ o. $\frac{1}{\sqrt{x}}$ p. \sqrt{x}
29. Photo electric effect is maximum in
 i. Cs j. Na k. K l. Li
30. Dimer Al₂Cl₆ is formed because
 i. Al is electron rich
 j. Aluminium is having lone pair of electron
 k. Aluminium forms coordinate bonds with chlorine to complete its octet
 l. Aluminium donates lone pair to form bridge
31. Which of the following are the chain isomers of pentane?
 a. n-pentane b. Isopentane c. Neopentane d. All of these
32. The weight percentage of NaCl solution is 10. If the weight of solution is 150 grams. Calculate the weight of NaCl and water respectively.
 a. 10 g and 120 g c. 15 g and 135 g
 b. 15 g and 120 g d. 135 g and 15 g
33. Number of structural isomers for C₄H₁₀O are
 a. 6 b. 7 c. 4 d. 5

- a. $\sqrt{70}$ b. $\sqrt{84}$ c. $\sqrt{97}$ d. $\sqrt{112}$
48. If angles A, B, C of a ΔABC form an increasing AP, then $\sin B$ is
- a. $\frac{1}{2}$ b. $\frac{\sqrt{3}}{2}$ c. 1 d. $\frac{1}{\sqrt{2}}$
49. $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta)$ is equal to
- e. 0 f. 1 g. -1 h. None of these
50. If the area of a sector of a circle bounded by an arc of length 5π cm is equal to 20π cm², then its radius is
- e. 12 cm f. 16 cm g. 8 cm h. 10 cm
51. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is
- i. 13 : 22 j. 14 : 11 k. 22 : 13 l. 11 : 14
52. The probability of guessing the correct answer to a certain test questions is $\frac{x}{12}$. If the probability of not guessing the correct answer to this question is $\frac{2}{3}$, then x is
- e. 2 f. 3 g. 4 h. 6
53. In an equilateral triangle ABC if $AD \perp BC$ then $AD^2 =$ _____
- a. CD^2 b. $2CD^2$ c. $3CD^2$ d. $4CD^2$
54. In a two digit number, the units digit is twice the tens digit. If 27 is added to the number, the digits interchange their places. Then the number is
- a. 36 b. 63 c. 26 d. 46
55. The maximum volume of a cone that can be carved out of a solid hemisphere of radius r is
- a. $3\pi r^2$ b. $\frac{\pi r^2}{3}$ c. $3\pi r^3$ d. $\frac{\pi r^3}{3}$
56. If the distance between the points $(4, p)$ and $(1, 0)$ is 5, then $p =$
- i. ± 4 j. 4 k. -4 l. 0
57. If the polynomial $f(x) = ax^3 + bx - c$ is divisible by the polynomial $g(x) = x^2 + bx + c$, then $ab =$
- m. 1 n. $\frac{1}{c}$ o. -1 p. $-\frac{1}{c}$
58. The lengths of the diagonals of a rhombus are 24 cm and 10 cm, then each side of the rhombus is
- a. 13 cm b. 12 cm c. 5 cm d. 11 cm
59. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the side of 3 cm to form a cone. The volume of the cone so formed is
- e. 15π cm³ f. 12π cm³ g. 16π cm³ h. 20π cm³
60. The exponent of 2 in the prime factorization of 144 _____

- i. 4 j. 5 k. 6 l. 3

61. Which of the following is not a measure of central tendency?

- d. Mean e. Median f. Mode g. Standard deviation

62. What should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the resulting polynomial?

- i. 1 j. 2 k. 4 l. 5

63. The area of a triangle formed by $(a, b + c)$, $(b, c + a)$, $(c, a + b)$ is

- a. $a + b + c$ b. abc c. $(a + b + c)^2$ d. 0

64. The first three terms of an AP respectively are $3y - 1$, $3y + 5$ and $5y + 1$. Then y equals

- e. -3 f. 4 g. 5 h. 2

65. If $a \cos \theta + b \sin \theta = m$ and $a \sin \theta - b \cos \theta = n$, then $a^2 + b^2$

- a. $m^2 - n^2$ b. $m^2 n^2$ c. $n^2 - m^2$ d. $m^2 + n^2$

66. Two numbers 'a' and 'b' are selected successively without replacement in that order from the integers 1 to 10. The probability that $\frac{a}{b}$ is an integer is

- i. $\frac{17}{45}$ j. $\frac{1}{5}$ k. $\frac{17}{90}$ l. $\frac{8}{45}$

67. The circumference of a circle is 100 cm. The side of a square inscribed in the circle is

- a. $50\sqrt{2}$ cm b. $\frac{100}{\pi}$ cm c. $\frac{50\sqrt{2}}{\pi}$ cm d. $\frac{100\sqrt{2}}{\pi}$ cm

68. A fraction becomes $\frac{4}{5}$, if 1 is added to both numerator and denominator. If, however 5 is subtracted from both numerator and denominator, the fraction becomes $\frac{1}{2}$. Then the fraction is

- e. $\frac{9}{7}$ f. $\frac{3}{7}$ g. $\frac{7}{9}$ h. $\frac{5}{9}$

69. If S_n denote the sum of 'n' terms of an AP with first term 'a' and common difference 'd' such that $\frac{S_x}{S_{kx}}$ is independent of x , then

- i. $d = a$ j. $d = 2a$ k. $a = 2d$ l. $d = -a$

70. A bag contains three green marbles, four blue marbles and two orange marbles. If a marble is picked at random, then the probability that it is not an orange marble is

- m. $\frac{1}{4}$ n. $\frac{1}{3}$ o. $\frac{4}{9}$ p. $\frac{7}{9}$

71. Pair of Viral diseases is

- a. Ring worm , AIDS c. Dysentery , Common cold
b. Typhoid , Tuberculosis d. Common cold , AIDS

72. Correct equation for photosynthesis is

- a. $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$
 b. $6CO_2 + 6H_2O \xrightarrow{\text{Light}} 6CO_2 + 6H_2O$
 c. $6CO_2 + 12H_2O \xrightarrow{\text{Light}} C_6H_{12}O_6 + 6O_2 + 6H_2O$
 d. $6CO_2 + 10H_2O \xrightarrow{\text{Light}} C_6H_{12}O_6 + 6O_2 + 4H_2O$

73. Read the following statements and find out the incorrect statement

- e. Transpiration pull does not account for the majority of water transport, most plants meet their need by root pressure.
 f. Water loss in liquid phase is called guttation while in vapour phase is called transpiration.
 g. Besides the loss of water vapour in transpiration, exchange of oxygen and carbon dioxide in the leaf also occurs through stomata.
 h. When guard cells become flaccid, stomata closes and if turgid, stomata opens

74. Anaerobic respiration takes place in

- e. Ribosome f. Nucleus g. Vacuole h. Cytoplasm

75. In a protein, amino acids are linked by

- a. Peptide bonds c. Hydrogen bonds
 b. Glycosidic bonds d. All of these

76. Father of endocrinology is

- a. Einthoven b. Addison c. Pasteur d. Whittaker

77. Which one is a wisdom teeth?

- a. Third molar, four in number c. Second molar, four in number
 b. Third molar, two in number d. Second molar, two in number

78. Yellow colour of faeces is on account of

- a. Excessive turmeric c. Degradation product of hemoglobin
 b. Bile d. None of these

79. Alveoli become enlarged and damaged with reduced surface area in heavy smokers.

The condition is called

- a. Silicosis b. Emphysema c. Asthma d. Bronchitis

80. Serum is

- i. Blood minus fibrinogen k. Lymph
 j. Lymph minus corpuscles l. Blood minus corpuscles and fibrinogen

81. Carbohydrate digestion begins in

- i. Stomach j. Mouth k. Intestine l. All of these

82. In flowering plants, meiosis takes place during

- a. Pollen grain formation
 - b. Seed formation
 - c. Gamete formation
 - d. Seed germination
83. Green house effect is related to
- a. Increased growth of green algae
 - b. Global warming
 - c. Cultivation of vegetables in houses
 - d. Development of terrace gardens
84. Womb is the another name of
- a. Vagina
 - b. Cervix
 - c. Oviduct
 - d. Uterus
85. Carnivores represent
- a. Primary consumer
 - b. Secondary and tertiary consumer
 - c. Secondary consumer
 - d. Reducers
86. Urine flows into ureters from
- e. Kidney febris
 - f. Urinary bladder
 - g. Urethra
 - h. Collecting ducts
87. Cattle are able to digest cellulose which humans cannot because cattle have
- a. Cellulose digesting bacterias
 - b. More efficient digestive system
 - c. Large stomach
 - d. Long intestine
88. Hormone act on
- a. Organ systems
 - b. Cells
 - c. Target organs
 - d. Cell receptors
89. Pulmonary artery drains deoxygenated blood from
- a. Right ventricle
 - b. Right atrium
 - c. Left atrium
 - d. Left ventricle
90. One of the following movements is not completely involuntary. It is
- a. Peristalsis
 - b. Systole of ventricles
 - c. Dilation of eye pupil
 - d. Deglutition

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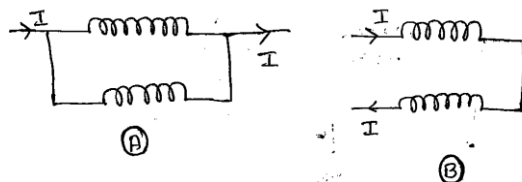
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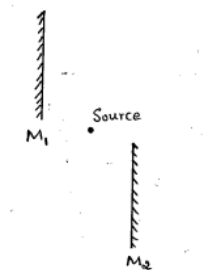
- Light is travelling from medium A to medium B. Where refractive index of B is 1.3. For some angle of incidence light is completely reflected back to the same medium. The refractive index of A is
m. 1 n. 1.2 o. 1.7 p. 1.25
- Focal length of convex lens is 15 cm. When exactly half of the lens is covered with non transparent material, then new focal length will be
i. 30 cm j. 10 cm k. 45 cm l. 15 cm
- Which of the following statement (S) false for a particle moving in a circle with constant angular speed
m. The acceleration vector points to the centre of the circle
n. Velocity vector points to the centre of the circle
o. Velocity vector is tangent to the circle
p. Acceleration vector is tangent to the circle
- Inside diamagnetic material number of magnetic field lines
i. Greater than outside
j. Equal to outside
k. Less than outside
l. No magnetic field lines
- Find direction of magnetic field at X when current direction at Y is outward.



- Inward j. Outward k. Up l. Down
- In which case mutual inductantion is more



- A k. Mutual inductance is same is A and B
- B l. Mutual inductance is zero in both the cases



- i. Two j. Infinite k. One l. Three
16. If $360^\circ = 2\pi$ radian, then angular speed of minute hand of clock is
 e. $0.105 \text{ rad sec}^{-1}$ g. $0.207 \text{ rad sec}^{-1}$
 f. $0.00174 \text{ rad sec}^{-1}$ h. $0.3127 \text{ rad sec}^{-1}$
17. Conductors can be charged by three methods that are
 ii. Friction ii. Conduction iii. Induction
 An insulator can be charged by
 i. Only friction k. Only Induction
 j. Only conduction l. Both conduction and friction
18. If a 30 V , 90 W bulb is to be worked in 120 V line, the resistance to be connected in series with the bulb is
 i. 20Ω j. 10Ω k. 40Ω l. 30Ω
19. By mistake a voltmeter is connected in series and an ammeter in parallel when the circuit is switched on
 e. Both ammeter and voltmeter will be damaged
 f. Neither the ammeter nor the voltmeter will be damaged
 g. Only the ammeter will be damaged
 h. Only the voltmeter will be damaged
20. Inside battery electrons are moving from
 i. Higher to lower potential end
 j. Lower to higher potential end
 k. Electrons are not flowing inside battery
 l. None of these
21. Eka – aluminium and Eka – silicon are known as
 m. Gallium and Germanium o. Iron and Sulphur
 n. Aluminium and Silicon p. Boron and Technitium
22. The angular momentum of electron in d orbital is equal to
 i. $2\sqrt{3} h$ j. $0 h$ k. $\sqrt{6} h$ l. $\sqrt{2} h$

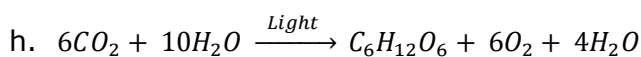
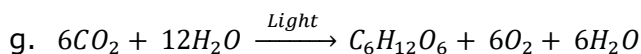
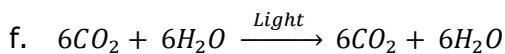
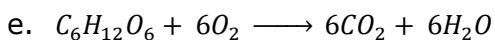
23. Which one of the following orders is not in accordance with the property stated against it?
- $F_2 > Cl_2 > Br_2 > I_2$: bond dissociation energy
 - $F_2 > Cl_2 > Br_2 > I_2$: oxidizing power
 - $HI > HBr > HCl > HF$: acidic property in water
 - $F_2 > Cl_2 > Br_2 > I_2$: electronegativity
24. Which process of purification is represented by the following scheme?
- $$Ti(\text{impure}) + 2I_2 \xrightarrow{250^\circ C} TiI_4 \xrightarrow{1400^\circ C} Ti(\text{pure}) + I_2$$
- Cupellation
 - poling
 - electrolytic refining
 - Van-Arkel process
25. Malachite ore has
- Cu
 - Mg
 - Ag
 - Al
26. 5.6 L of oxygen at NTP is equivalent to –
- 1 mole
 - $\frac{1}{2}$ mole
 - $\frac{1}{4}$ mole
 - $\frac{1}{8}$ mole
27. For a real gas, Z shows
- $Z < 1$, gas is less compressible
 - $Z > 1$, gas is more compressible
 - $Z = \infty$, for an ideal gas
 - $PV \neq nRT$, for real gas
28. Reaction between following pairs will produce by hydrogen except
- $Cu + HCl$
 - $Fe + H_2SO_4$
 - $Mg + \text{Steam}$
 - $Na + \text{alcohol}$
29. Household gaseous fuel (LPG) mainly contains
- CH_4
 - C_2H_2
 - C_2H_4
 - C_4H_{10}
30. The compound A on heating gives a colourless gas and residue that is dissolved in water to obtain B. excess of CO_2 is bubbled through aqueous solution of B, C is formed which is recovered in the solid form. Solid C on gentle heating gives back A. the compound is
- Na_2CO_3
 - K_2CO_3
 - $CaSO_4 \cdot 2H_2O$
 - $CaCO_3$
31. The products obtained on heating $LiNO_3$ will be
- $LiNO_2 + O_2$
 - $Li_2O + NO_2 + O_2$
 - $Li_3N + O_2$
 - $Li_2O + NO + O_2$
32. The compound that is not a Lewis acid is
- BF_3
 - $AlCl_3$
 - PCl_3
 - $SnCl_4$
33. The gas released during the reaction of metal carbonates with dilute acids is:
- SO_2
 - NO_2
 - Cl_2
 - CO_2
34. If a saturated solution is heated, it
- Changes to unsaturation
 - Changes to super saturation
 - Remains same
 - Till $50^\circ C$, changes to unsaturation and then super saturation

35. The volume of oxygen required for the complete combustion of 4 lit of ethane is
 a. 4 lit b. 8 lit c. 14 lit d. 12 lit
36. Which of the following taking place in the blast furnace is endothermic
 e. $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ g. $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$
 f. $2\text{C} + \text{O}_2 \rightarrow 2\text{CO}$ h. $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$
37. The molecule which has zero dipole moment is
 i. CH_2Cl_2 j. BF_3 k. NF_3 l. ClO_2
38. Which concept best explains the fact that o-nitrophenol is more volatile than p-nitrophenol ?
 i. Resonance k. Hydrogen bonding
 j. Hyperconjugation l. Steric hindrance
39. Calculate the initial volume if a sample of gas at 75 C is changed to 1.50 L at 25 C at constant pressure.
 i. 1.75 L j. 1.95 L k. 1.85 L l. 1.65 L
40. If 6.537 g of zinc reacts with exactly 7.0906 g of chlorine to form the only compound of chlorine and zinc, how much zinc will react with 14.18g of chlorine?
 e. 11.06 g f. 14.90 g g. 13.07 g h. 12.89 g
41. The exponent of 2 in the prime factorization of 144 _____
 a. 4 b. 5 c. 6 d. 3
42. If $ax^2 + bx + c = 0$ has equal roots, then $c =$
 a. $-\frac{b}{2a}$ b. $\frac{b}{2a}$ c. $-\frac{b^2}{4a}$ d. $\frac{b^2}{4a}$
43. The distance between the points $(\cos \theta, \sin \theta)$ and $(\sin \theta, -\cos \theta)$ is
 i. $\sqrt{3}$ j. $\sqrt{2}$ k. 2 l. 3
44. The area of a triangle formed by $(a, b + c), (b, c + a), (c, a + b)$ is
 i. $a + b + c$ j. abc k. $(a + b + c)^2$ l. 0
45. PQ is a tangent drawn from a point P to a circle with centre O and QOR is the diameter of the circle such that $\angle POR = 120^\circ$, then $\angle OPQ$ is
 m. 60° n. 45° o. 30° p. 90°
46. Which of the following is not a measure of central tendency?
 h. Mean i. Median j. Mode k. Standard deviation
47. If the mean of first n natural numbers is $\frac{5n}{9}$, then $n =$
 i. 5 j. 4 k. 9 l. 10
48. If the polynomial $f(x) = ax^3 + bx - c$ is divisible by the polynomial $g(x) = x^2 + bx + c$, then $ab =$
 q. 1 r. $\frac{1}{c}$ s. -1 t. $-\frac{1}{c}$

49. What should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the resulting polynomial?
- m. 1 n. 2 o. 4 p. 5
50. Let S_n denote the sum of 'n' terms of an AP whose first term is 'a'. If the common difference 'd' is given by $d = S_n - kS_{n-1} + S_{n-2}$, then k is
- i. 1 j. 2 k. 3 l. None of these
51. If the sum of 'p' terms of an AP is 'q' and the sum of 'q' terms is P, then the sum of $p + q$ terms will be
- a. 0 b. $p - q$ c. $p + q$ d. $-(p + q)$
52. If $\frac{5+9+13+\dots+n \text{ terms}}{7+9+11+\dots \text{to } (n+1) \text{ terms}} = \frac{17}{16}$, then n is
- q. 8 r. 7 s. 10 t. 11
53. If $A + B = 90^\circ$, then $\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B} - \frac{\sin^2 B}{\cos^2 A}$ is equals to
- a. $\cot^2 A$ b. $\cot^2 B$ c. $-\tan^2 A$ d. $-\cot^2 A$
54. If angles A, B, C of a ΔABC form an increasing AP, then $\sin B$ is
- e. $\frac{1}{2}$ f. $\frac{\sqrt{3}}{2}$ g. 1 h. $\frac{1}{\sqrt{2}}$
55. If $3 \cos \theta = 5 \sin \theta$, then the value of $\frac{5 \sin \theta - 2 \sec^3 \theta + 2 \cos \theta}{5 \sin \theta + 2 \sec^3 \theta - 2 \cos \theta}$ is
- e. $\frac{271}{979}$ f. $\frac{316}{2937}$ g. $\frac{542}{2937}$ h. None of these
56. If $a \cos \theta + b \sin \theta = m$ and $a \sin \theta - b \cos \theta = n$, then $a^2 + b^2$
- a. $m^2 - n^2$ b. $m^2 n^2$ c. $n^2 - m^2$ d. $m^2 + n^2$
57. The radius of a circle is 20 cm. It is divided into four parts of equal area by drawing three concentric circles inside it. Then, the radius of the largest of three concentric circles drawn is
- m. $10\sqrt{5}$ cm n. $10\sqrt{3}$ cm o. 10 cm p. $10\sqrt{2}$ cm
58. If the difference between the circumference and radius of a circle is 37 cm, then using $\pi = \frac{22}{7}$, the circumference (in cm) of the circle is
- i. 154 j. 44 k. 14 l. 7
59. If the sum of the areas of two circles with radii r_1 and r_2 is equal to the area of a circle of radius 'r', then $r_1 + r_2$
- a. $> r^2$ b. $= r^2$ c. $< r^2$ d. None of these
60. If the area of a circle is equal to the sum of the area of two circles of diameters 10 cm and 24 cm, then diameter of the larger circle (in cm) is
- i. 34 j. 26 k. 17 l. 14

61. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is
 m. 13 : 22 n. 14 : 11 o. 22 : 13 p. 11 : 14
62. If a number x is chosen from the numbers 1,2,3 and a number 'y' is selected from the numbers 1,4,9. Then, $P(xy < 9)$
 a. $\frac{7}{9}$ b. $\frac{5}{9}$ c. $\frac{2}{3}$ d. $\frac{1}{9}$
63. The probability of guessing the correct answer to a certain test questions is $\frac{x}{12}$. If the probability of not guessing the correct answer to this question is $\frac{2}{3}$, then x is
 i. 2 j. 3 k. 4 l. 6
64. Two different coins are tossed simultaneously. The probability of getting at least one head is
 i. $\frac{1}{4}$ j. $\frac{1}{8}$ k. $\frac{3}{4}$ l. $\frac{7}{8}$
65. The different coins are tossed simultaneously. The probability of getting at least one head is
 i. $\frac{1}{4}$ j. $\frac{1}{8}$ k. $\frac{3}{4}$ l. $\frac{7}{8}$
66. In a ΔABC , $\angle A = 90^\circ$, $AB = 5$ cm and $AC = 12$ cm. If $AD \perp BC$, then $AD =$ _____
 e. $\frac{13}{2}$ cm f. $\frac{60}{13}$ cm g. $\frac{13}{60}$ cm h. $\frac{2\sqrt{15}}{13}$ cm
67. The length of the shadow of a tower standing on level ground is found to be $2x$ meters longer when the sun's elevation is 30° than when it was 45° . The height of the tower in metres is
 e. $(\sqrt{3} + 1)x$ f. $(\sqrt{3} - 1)x$ g. $2\sqrt{3}x$ h. $3\sqrt{2}x$
68. A fraction becomes $\frac{4}{5}$, if 1 is added to both numerator and denominator. If, however 5 is subtracted from both numerator and denominator, the fraction becomes $\frac{1}{2}$. Then the fraction is
 i. $\frac{9}{7}$ j. $\frac{3}{7}$ k. $\frac{7}{9}$ l. $\frac{5}{9}$
69. A rectangular sheet of paper 40 cm x 22 cm is rolled to form a hollow cylinder of height 40 cm. The radius of the cylinder is
 i. 3.5 cm j. 7 cm k. $\frac{80}{7}$ cm l. 5 cm
70. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the side of 3 cm to form a cone. The volume of the cone so formed is
 i. 15π cm³ j. 12π cm³ k. 16π cm³ l. 20π cm³
71. Genetic material without nuclear membrane is found in
 i. Bacteria and Mycoplasma k. Archaeobacteria and Blue green algae
 j. Cyanobacteria and Bacteria l. All of these

72. Correct equation for photosynthesis is



73. Leaves are green because they

m. Absorb green light

n. Do not absorb green light but reflect green light

o. Utilise green light

p. Absorb and reflect green light

74. In plants, glucose is derived from sucrose, which is the end product of photosynthesis or from storage carbohydrates. Sucrose is converted into glucose and fructose by the enzyme

i. Zymase

j. Hexokinase

k. Sucrase

l. Invertase

75. Shock movements of leaves of sensitive plants *Mimosa pudica* are

m. Thermonasty

n. Seismonasty

o. Hydrotropism

p. Chemonasty

76. Enzymes are basically made of

q. Nucleic acids

r. Proteins

s. Fats

t. Vitamins

77. The hypothalamic hormones regulate the synthesis and secretion of

a. Thyroid hormone

c. Adrenal hormones

b. Parathyroid hormone

d. Pituitary hormones

78. On seeing a tiger, the heart beat and blood pressure increase due to release of hormone

a. Adrenaline

b. Thyroxine

c. Parathormone

d. Corticoides

79. Which one is a wisdom teeth?

e. Third molar, four in number

g. Second molar, four in number

f. Third molar, two in number

h. Second molar, two in number

80. Muscular contractions of alimentary canal are

a. circulation

b. Deglutition

c. Churning

d. Peristalsis

81. Which gland does not take part in saliva production

i. Parotid

j. Submaxillary

k. Submucosal

l. Sublinguals

82. A molecule of haemoglobin carries how many oxygen molecules

m. 1

n. 2

o. 3

p. 4

83. The life of the erythrocytes in mammalian blood is about

a. 120 days

b. 150 days

c. 190 days

d. 180 days

84. Urine flows into ureters from

- a. Kidney febris b. Urinary bladder c. Urethra d. Collecting ducts

85. Assertion: In sexual reproduction, offsprings are not identical to the parents or amongst themselves.

Reason: Sexual reproduction involves fusion of male and female gametes.

- e. If both assertion and reason are true and the reason is the correct explanation of the assertion.
f. If both assertion and reason are true but reason is not the correct explanation of the assertion.
g. If assertion is true but reason is false
h. If both assertion and reason are false

86. Double fertilization is fusion of

- a. Two eggs
b. Two eggs and polar nuclei with pollen nuclei
c. One male gamete with egg and other with synergid
d. One male gamete with egg and other with secondary nucleus

87. Ozone hole refers to

- e. Hole in ozone layers
f. Reduction in thickness of ozone layer in stratosphere
g. Reduction of thickness of ozone in troposphere
h. Increased concentration of ozone

88. Carnivores represent

- e. Primary consumer g. Secondary consumer
f. Secondary and tertiary consumer h. Reducers

89. Womb is the another name of

- e. Vagina f. Cervix g. Oviduct h. Uterus

90. Fossil man expert in making cave paintings and tools was

- a. Cro – Magnon man c. Java Man
b. Peking Man d. Neanderthal Man

😊😊😊😊😊 **Best of Luck** 😊😊😊😊😊