CLASS : XI BIOLOGY

1. **Rhodospirillum is:**

   (A) non-sulphur purple bacterium

   (B) photoheterotroph

   (C) nitrogen fixing and non-symbiotic

   (D) all of these

2. **Elongation of cut stems, coleoptiles, cell enlargement in tissue culture is due to:**

   (A) auxins (B) zeatin (C) C_2H_4 (D) dormin

3. **When flower is bracteolate, it is normally pedicellate also because:**

   (A) bracts are absent (B) bracteoles arise on pedicel

   (C) pedicel is branched (D) none of the above

4. **Circinotropous ovule is found in:**

   (A) Opuntia (B) Primula

   (C) Ranunculus (D) Tridax

5. **Pteridophytes differ from mosses in having:**

   (A) independent gametophyte

   (B) dependent gametophyte

   (C) independent and dominant sporophyte

   (D) flagellate antherozoids

6. **Which of these is a modification of tap root?**

   (A) Pneumatophores (B) Prop roots

   (C) Stilt roots (D) Assimilatory roots

7. **Inflorescence of jowar is:**

   (A) capitulum (B) spike of spikelet

   (C) verticillaster (D) cyathium

8. **Secondary transfusion tissue of cycas is a xerophytic adaptation to reduce transpiration because of:**

(A) replacing lateral veins

(B) reducing spongy parenchyma

(C) replacing dead xylem cells with parenchyma

(D) acting as heat screen

9. **Match the following and choose the correct combination from the options given.**

a. Potassium	*1. Constituent of ferredoxin*
b. Sulphur	*2. Involved in stomatal movement*
c. Molybdenum	*3. Needed in the synthesis of auxin*
d. Zinc	*4. Component of nitrogenase*

(A) a - 2, b - 1, c - 3, d - 4 (B) a - 2, b - 1, c - 4, d - 3

(C) a - 4, b - 3, c - 2, d - 1 (D) a - 3, b - 4, c - 1, d - 2

10. **If there is no meiosis during sexual reproduction the following occurs.**

P - The chromosome number would be doubled in next generation

Q - Abnormal polyploidy occurs

R - Causes genetic disorders

S - Chromosome number would be reduced to half in next generation

(A) P only (B) P, R and S only

(C) P, Q and R only (D) P, Q, R and S

11. **Transcription, translation and DNA replication occur in:**

(A) Golgi bodies (B) chloroplasts

(C) mitochondria (D) both B and C

12. **'P' forms from proplastids. 'P' synthesizes 'Q'. 'Q' is used by 'R' to release ATP, CO_2 and H_2O. P, Q and R are:**

	P	Q	R
(A)	Chloroplasts	Starch	Mitochondria
(B)	Chromoplasts	Fat	Golgi complex
(C)	Leucoplasts	Proteins	Lysosomes
(D)	Proplastids	Food	Respiration

13. **Early wood differs from late wood with respect to:**

I	*origin*
II	*number of vessels*
III	*diameter of lumen*

(A) I only (B) II and III only

(C) II only (D) III only

14. **Assertion (A): Drupe develops from unilocular superior ovary.**

Reason (R): Drupe is indehiscent fleshy fruit.

(A) Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'

(B) Both 'A' and 'R' are true, but 'R' is not the correct explanation of 'A'

(C) 'A' is true, 'R' is false

(D) 'A' is false, 'R' is true

15. **The modification of leaves into tendrils, scales and bladders are seen respectively in:**

(A) Sweet pea, Nerium and Nepenthes

(B) Sweet pea, Casuarina and Utricularia

(C) Utricularia, Sweet pea and Nerium

(D) Nerium, Casuarina and Utricularia

16. **Which group of fungi is commonly called the club fungi?**

(A) Basidiomycetes (B) Ascomycetes

(C) Zygomycetes (D) Phycomycetes

17. **The cohesive force existing between molecules of water is contributing to:**

(A) plasmolysis (B) translocation

(C) osmosis (D) ascent of sap

18. **Gibberellins promote the production of:**

(A) male flowers (B) female flowers

(C) neutral flowers (D) abscission layer

19. **Which one of the following is a correct match?**

(A) First stable product of C_4 cycle - Oxaloacetic acid

(B) C_4 plants - Kranz anatomy

(C) Primary acceptor during CO_2 fixation in C_3 plants - Ribulose biphosphate

(D) All of the above

20. **The figure given above shows a germinating seed. In which direction does the shoot and root grow while the seed germinates?**

(A) 

(B) 

(C) 

(D) 

21. Contraction of skeletal muscle always occurs in the sites from:

(A) insertion to origin (B) intrinsic to extrinsic

(C) extrinsic to intrinsic (D) origin to insertion

22. Fattening refers to:

(A) fat content in shrimps (B) storing of crabs

(C) spat of oysters (D) fast growth of crabs

23. Antibody is produced by:

(A) T - Lymphocyte (B) Heparin

(C) B - Lymphocyte (D) both A and B

24. In cockroach, epipharynx is associated with:

(A) labrum (B) labium

(C) mandible (D) maxilla

25. Primary and secondary metabolic products are respectively:

(A) enzymes and vitamins (B) vitamins and vaccines

(C) vaccines and enzymes (D) vitamins and antibiotics

26. Areolar connective tissue joins:

(A) bones with muscles

(B) fat body with muscles

(C) muscles with bones

(D) integument with muscles

27. The transport vesicles of endoplasmic reticulum without ribosomes constitute:

P - proteins

Q - glycogen

R - steroid hormones

(A) P only (B) Q and R only

(C) P and R only (D) P, Q and R

28. Fitness training increases the concentration of lactic acid that athletes can tolerate in their muscles. What is the consequence of this increase?

(A) Aerobic respiration in muscles can be more rapid

(B) More energy is needed by the muscles

(C) More anaerobic respiration can take place in muscles

(D) Blood flow to the muscles is increased

29. The correct sequence of following hormones that involved in reabsorption of water, Na^+ ions and Ca^{++} ions in nephron is:

(A) Parathormone → ADH → Aldosterone

(B) Vasopressin → Oxytoxin → Parathormone

(C) Parathormone → Vasopressin → Calciferol

(D) Vasopressin → Aldosterone → Parathormone

30. Sensory organs in Ascaris are:

(A) amphids (B) phasmids

(C) papillae (D) all of these

31. Assertion (A): Aves exhibits seasonal migration

Reason (R): Seasonal and circardian sexual rhythms are under regulation of thyroid gland.

(A) Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'

(B) Both 'A' and 'R' are true, but 'R' is not the correct explanation of 'A'

(C) 'A' is true, 'R' is false

(D) 'A' is false, 'R' is true

32. The action of enzymes in poikilotherms is explained by:

(A) van't Hoff's rule (B) Linderman's rule

(C) Allen's rule (D) none of the above

33. Study the following statements regarding Cnidarians.

I Ciliated planula larva is present in the life cycle

II Tissue grade of organisation first appears

III Trichosysts are present in the body wall

The correct combination is:

(A) Only I and II are correct (B) Only II and III are correct

(C) Only I and III are correct (D) All are correct

34. Which of the following is devoid of blood supply?

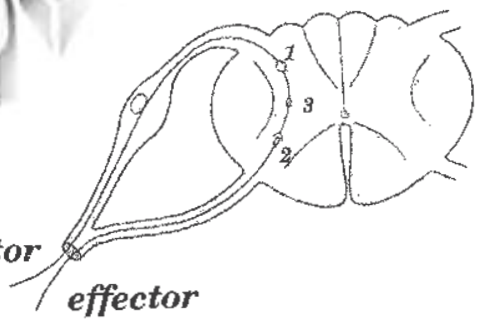
(A) Retina (B) Choroid (C) Cornea (D) Sclerotic

35. Chemicals in tobacco smoke lead to the breakdown of the elastic tissue in the alveoli. What is the name of this condition?

(A) Bronchitis (B) Emphysema

(C) Heart disease (D) Lung cancer

36. The diagram shows a section of the spinal cord.



Which of the following identifies the neurons of the reflex arc shown?

	Motor neuron	Relay neuron	Sensory neuron
(A)	1	2	3
(B)	1	3	2
(C)	2	1	3
(D)	2	3	1

37. 'Heart - of - heart' is:

(A) SA node (B) AV node

(C) bundle of His (D) Purkinje fibres

38. Glycogen is:

(A) synthesized in liver, source of energy, forms bile and lipase

(B) disaccharide stored in liver, reacts with ammonia to form protein

(C) synthesized in blood, stored in liver and muscle to provide glucose

(D) polysaccharide synthesized and stored in liver

39. The chambers in the heart of Periplaneta americana are:

(A) 13 (B) 9 (C) 12 (D) 15

40. What are palade particles?

(A) Ribosomes (B) Lysosomes

(C) Microtubules (D) Nucleosomes

CLASS : XI PHYSICS

41. **A point initially at rest moves along x-axis. Its acceleration varies with time as $a = (9t + 2)$ m/s^2. If it starts from origin, the distance covered in 2 s is:**

(A) 20 m (B) 14 m (C) 16 m (D) 18 m

42. **For inelastic collision between two spherical rigid bodies:**
(Assume no external forces acting)

(A) the total kinetic energy is conserved

(B) the linear momentum is not conserved

(C) the total mechanical energy is conserved

(D) the linear momentum is conserved

43. **The vectors A and B are such that $|A + B| = |A - B|$. The angle between the two vectors is:**

(A) 45° (B) 90° (C) 60° (D) 75°

44. **The moment of inertia of a uniform circular disc of radius R and mass M about an axis touching the disc at its diameter end and normal to the disc is.**

(A) $\frac{MR^2}{2}$ (B) MR^2 (C) $\frac{2}{5} MR^2$ (D) $\frac{3}{2} MR^2$

45. **A force of 10 N is applied on a body for 3 seconds and the corresponding displacement 6 m. The power of the source is:**

(A) 20 W (B) 25 W (C) 40 W (D) 50 W

46. **If 'h' is the height of capillary rise and 'r' be the radius of capillary tube, then which of the following relation will be correct?**

(A) hr = constant (B) $\frac{h}{r^2}$ = constant

(C) hr^2 = constant (D) $\frac{h}{r}$ = constant

47. **A 500 kg car takes a round turn of radius 50 m with a velocity of 36 kmph. The centripetal force is:**

(A) 250 N (B) 750 N (C) 1000 N (D) 1200 N

48. **The potential energy of a simple harmonic oscillator, when the particle is half way to its end point, is:** ***(E is total energy)***

(A) $\frac{E}{4}$ (B) $\frac{E}{2}$ (C) $\frac{2E}{3}$ (D) $\frac{E}{8}$

49. **A man of mass 60 kg stands on the floor of a lift which is accelerating downwards at 1 m/s^2. Then, the reaction of the floor of the lift on the man is:** ***(Take g = 10 m/s^2)***

(A) 528 N (B) 600 N (C) 540 N (D) 546 N

50. **743 J of heat energy is added to raise the temperature of 5 moles of an ideal gas by 2 k at constant pressure. How much heat energy is required to raise the temperature of the same mass of the gas by 2 k at constant volume?** ***(Take R = 8.3 J/k-mol)***

(A) 826 J (B) 743 J (C) 660 J (D) 620 J

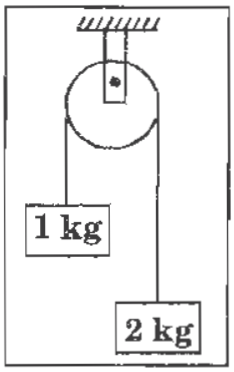
51. **E_O and E_H respectively represent the average kinetic energy of a molecule of oxygen and hydrogen. If the two gases are at the same temperature, which of the following statements will be true?**

(A) $E_O > E_H$ (B) $E_O = E_H$ (C) $E_O < E_H$

(D) Nothing can be said about the magnitude of E_O and E_H as the information given is insufficient

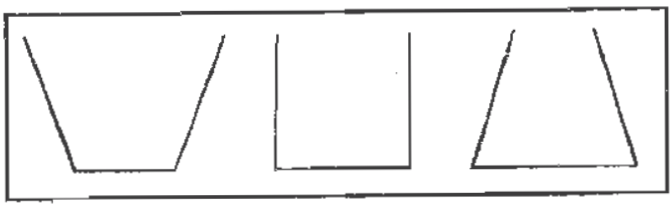
52. **Two bodies of masses 1 kg and 2 kg are connected by a steel wire of cross-section 2 cm^2 going over a smooth pulley as shown. The longitudinal strain in the wire, is:**

(Take g = 10 m/s^2, y = 2 × 10^{11} N/m^2)



(A) 3.3×10^{-7} (B) 3.3×10^{-6} (C) 2×10^{-6} (D) 4×10^{-6}

53. The three vessels shown below have the same base areas.



(P) (Q) (R)

Equal volume of water is poured into three, the force on the base of vessel:

(A) P would be maximum (B) Q would be maximum

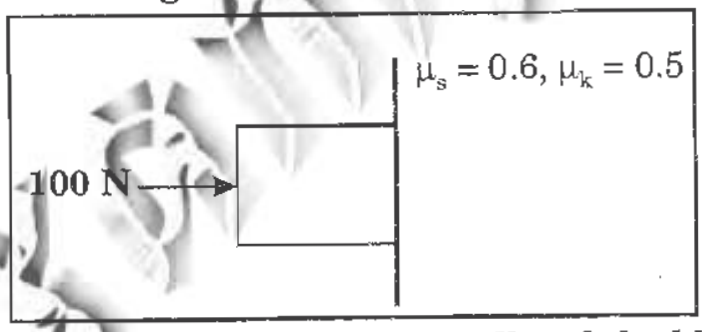
(C) R would be maximum (D) Equal in all three

54. The energy emitted per second by a black body at 27 °C is 20 J, if the temperature of the black body is increased to 327 °C, the energy emitted per second will be:

(A) 160 J (B) 320 J

(C) 480 J (D) 640 J

55. A block of mass 3 kg is pressed against a rough wall as shown in the figure.



The friction force between the wall and the block is:

(Take g = 10 m/s²)

(A) 60 N (B) 50 N (C) 30 N (D) 20 N

56. For a wave propagating in a medium, identify the property that is independent of the others?

(A) Velocity

(B) Wavelength

(C) Frequency

(D) All these depend on each other

57. A block of wood weighs 4 N in air and 2 N when immersed in a liquid. The buoyant force in newton is:

(A) zero (B) 1 N (C) 2 N (D) 3 N

58. The edge length of a cube is 1.32 cm, the total surface area and volume of cube are, respectively:

(A) 10.5 cm^2 and 2.30 cm^3 (B) 10.5 cm^2 and 2.20 cm^3

(C) 10.4 cm^2 and 2.20 cm^3 (D) 10.54 cm^2 and 2.298 cm^3

59. Two particles of masses m_1 and m_2 ($m_1 > m_2$) attract each other with a force inversely proportional to the square of the distance between them. The particles are initially held at rest and then released. Which one is correct?

(A) The centre of mass moves towards m_1

(B) The centre of mass moves towards m_2

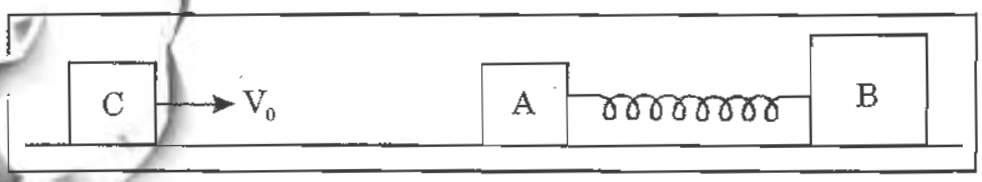
(C) The centre of mass remains at rest

(D) Centre of mass moves at right angles to the line joining m_1 and m_2

60. If a body is raised from the surface of the Earth up to height R, what is the change in potential energy?

(A) mg R (B) $\frac{3}{2}$ mg R (C) $\frac{mgR}{2}$ (D) $\frac{mgR}{4}$

61. A block C of mass 'm' is moving with velocity v_0 and collides elastically with block A of mass 'm' and connected to another block B of mass 2 m through spring of spring constant 'k'. What is 'k' if x_0 is compression of spring, when velocity of A and B is same?



(A) $\frac{mv_0^2}{x_0^2}$ (B) $\frac{mv_0^2}{2x_0^2}$ (C) $\frac{3}{2}\frac{mv_0^2}{x_0^2}$ (D) $\frac{2}{3}\frac{mv_0^2}{x_0^2}$

62. If the angular momentum of a rotating body about a fixed axis is increased by 10%, its kinetic energy will be increased by:

(A) 10% (B) 20% (C) 21% (D) 5%

63. Choose the correct statement from the following.

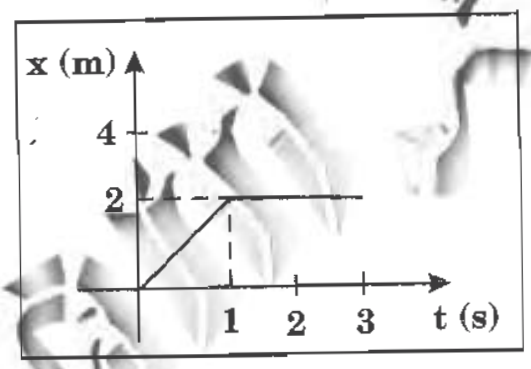
(A) Time period of a simple pendulum depends on amplitude

(B) Time shown by a spring watch varies with the acceleration due to gravity

(C) In a simple pendulum, the time period varies linearly with the length of the pendulum

(D) The graph between length of the pendulum and time period is a parabola

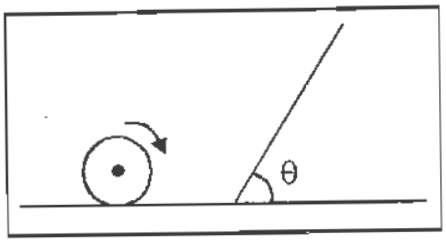
64. In the given figure the position-time graph of a particle of mass 0.1 kg is shown. Linear momentum at t = 2 s is:



(A) 0 (B) – 0.2 kg m/s^{-1}

(C) 0.1 kg m/s^{-1} (D) – 0.4 kg m/s^{-1}

65. A uniform solid cylinder rolling without slipping along a horizontal plane suddenly encounters a plane inclined at angle θ as shown in the figure. The value of θ which could bring the cylinder immediately to rest after impact, is:



(A) 90° (B) 60° (C) 120° (D) 30°

66. The smog is essentially caused by the presence of:

(A) oxides of sulphur and nitrogen (B) O_3 and N_2

(C) O_2 and O_3 (D) O_2 and N_2

67. Which of the following is responsible for depletion of the ozone layer in the upper strata of the atmosphere?

(A) Polyhalogens (B) Freons

(C) Fullerenes (D) Ferrocene

68. Reaction of HBr with propene in the presence of peroxide gives:

(A) alkyl bromide (B) 3-bromopropane

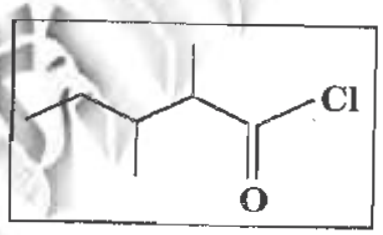
(C) isopropyl bromide (D) n-propyl bromide

69. Propyne when passed through a hot iron tube at 400 °C produces:

(A) methyl benzene (B) trimethyl benzene

(C) dimethyl benzene (D) benzene

70. The IUPAC name of



is:

(A) 2-ethyl-3-methyl butanoyl chloride

(B) 1-chloro-1-oxo- 2, 3-dimethyl pentane

(C) 2,3 dimethyl pentanoyl chloride

(D) 3,4 dimethyl pentanoyl chloride

71. The compounds $CH_3OC_3H_7$ and $C_2H_5OC_2H_5$ exhibit:

(A) chain isomerism (B) cis-trans isomerism

(C) metamerism (D) optical isomerism

72. Which of the following oxide is amphoteric in character?

(A) CO_2 (B) CaO (C) SiO_2 (D) SnO_2

73. Assertion (A): Alkali metals impart colour to the flame.

Reason (R): Their ionization energies are low.

(A) Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'.

(B) Both 'A' and 'R' are true but 'R' is not the correct explanation of 'A'.

(C) 'A' is true and 'R' is false.

(D) 'A' is false and 'R' is true.

74. Among the alkaline earth metals, the element forming predominantly covalent compound is:

(A) calcium (B) strontium

(C) barium (D) beryllium

75. Which of the following compounds are formed when BCl_3 is treated with water?

(A) $B_2H_6 + HCl$ (B) $H_3BO_3 + HCl$

(C) $B_2O_3 + HCl$ (D) $B_2O_3 + B_2H_6$

76. Polyphosphates are used as water softening agents because they:

(A) form soluble complexes with anionic species

(B) precipitate anionic species

(C) form soluble complexes with cationic species

(D) precipitate cationic species

77. Calcium phosphide gets hydrolysed and give:

(A) H_3PO_4 (B) $(HPO_3)_n$

(C) PH_3 (D) $Ca_3(PO_4)_2$

78. Sodium burns in air to give mainly:

(A) Na_2O (B) NaO_2 (C) Na_2O_2 (D) Na_2CO_3

79. Which of the following is a redox reaction?

(A) $CaC_2O_4 + 2HCl \longrightarrow CaCl_2 + H_2C_2O_4$

(B) $Mg(OH)_2 + 2NH_4Cl \longrightarrow MgCl_2 + NH_4OH$

(C) $Zn + 2AgCN \longrightarrow 2Ag + Zn(CN)_2$

(D) $NaCl + KNO_3 \longrightarrow NaNO_3 + KCl$

80. Nitrogen combines with oxygen to form nitric oxide.

$N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$, $\Delta H = +80$ kJ mol^{-1}

The decomposition of NO(g) is favoured by:

(A) decrease in pressure (B) increase in pressure

(C) decrease in temperature (D) increasing the concentration of N_2

81. ΔH and ΔS for the reaction are + 30.558 kJ mol^{-1} and 0.066 kJ mol^{-1} at 1 atm pressure. The temperature at which free energy is equal to zero and the nature of reaction below this temperature are:

(A) 483 K, spontaneous (B) 443 K, non-spontaneous

(C) 443 K, spontaneous (D) 463 K, non-spontaneous

82. Kinetic energy of a molecule is zero at:

(A) 0 °C (B) 273 °C (C) –273 °C (D) 116 °C

83. The rate of diffusion of methane at a given temperature is twice that of a gas X. The molecular weight of X is:

(A) 64 a.m.u (B) 16 a.m.u (C) 40 a.m.u (D) 80 a.m.u

84. Which of the following statements is NOT correct for sigma and pi bonds formed between two carbon atoms?

(A) Bond energies of sigma and pi bonds are in the order of 264 kJ mol^{-1}

(B) Sigma bond is stronger than pi bond

(C) Free rotation of atoms around a sigma bond is allowed but not in case of a pi bond

(D) Sigma bond determines the direction between carbon atoms but a pi bond has no primary effect in this regard

85. **In which of the following molecules are all the bonds NOT equal?**

(A) AlF_3 (B) BF_3 (C) NF_3 (D) ClF_3

86. **Arrange the following elements in the increasing order of their non-metallic character.**

B, C, Si, N and F

(A) F < N < Si < C < B (B) N < F < Si < C < B

(C) C < B < Si < N < F (D) B < C < Si < N < F

87. **Arrange each pair of ions in order of increasing ionic radius.**

(i) Mg^{2+} and Al^{3+} (ii) O^{2-} and S^{2-} (iii) O^{2-} and F^-

(A) (i) $Al^{3+} < Mg^{2+}$ (ii) $O^{2-} < S^{2-}$ (iii) $F^- < O^{2-}$

(B) (i) $Mg^{2+} < Al^{3+}$ (ii) $O^{2-} < S^{2-}$ (iii) $F^- < O^{2-}$

(C) (i) $Mg^{2+} < Al^{3+}$ (ii) $S^{2-} < O^{2-}$ (iii) $F^- < O^{2-}$

(D) $Al^{3+} < Mg^{2+}$ (ii) $O^{2-} < S^{2-}$ (iii) $O^{2-} < F^-$

88. **What transition in He^+ ion shall have the same wave number as the first line in Balmar series of H atom?**

(A) 7 ⟶ 5 (B) 4 ⟶ 2 (C) 6 ⟶ 4 (D) 5 ⟶ 3

89. **Electrons will first enter into the orbital with the set of quantum numbers:**

(A) $n = 5, l = 0$ (B) $n = 4, l = 1$

(C) $n = 3, l = 2$ (D) all of the above

90. **34.2 g of sucrose ($C_{12}H_{22}O_{11}$) are dissolved in 90 g of water in a glass. The number of oxygen atoms in the solutions are:**

(A) 3.66×10^{26} (B) 6.6×10^{23} (C) 3.66×10^{24} (D) 6.02×10^{19}

CLASS : XI GENERAL KNOWLEDGE

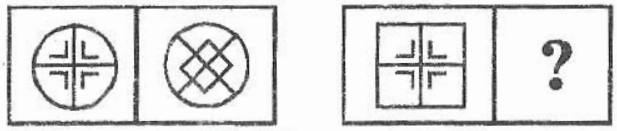
91. **Which of the following gives the meaning of the word 'ephemeral'?**

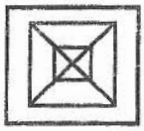
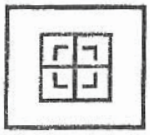
(A) Established (B) Short-lived

(C) Spiritual (D) Invisible

92. Study the relationship between the figures in Set I and find the missing figure in Set II?

I II



(A)  (B)  (C)  (D) 

93. The Simla Pact between India and Pakistan was signed by:

(A) Indira Gandhi and Zia-ul-Haq
(B) Lal Bahadur Shastri and Ayub Khan
(C) Indira Gandhi and Zulfikar Ali Bhutto
(D) Rajiv Gandhi and Benazir Bhutto

94. Which of the cities listed below is scheduled to host the 19th Commonwealth Games in 2010?

(A) Kula Lumpur (B) Bangkok (C) Victoria (D) New Delhi

95. What does the term 'pixel' as used in digital images stand for?

(A) Format (B) Resource Locator
(C) Picture element (D) None of these

96. What is the duration of the zero hour in the Lok Sabha?

(A) 15 minutes (B) Half an hour (C) One hour (D) Not specified

97. 'MODVAT' is the name of a:

(A) tribal group (B) networking technology
(C) official report (D) tax imposed on a product

98. Which one of the following is devoted to the cause of human rights?

(A) Amnesty international (B) Red Cross
(C) Group of 77 (D) Sandinista

99. What is referred to as 'the crossroads of Europe, Africa and Asia'?

(A) Nile (B) Amazon (C) Suez Canal (D) Congo

100. In 0' Clock, '0' is:

(A) the preposition 'of' (B) often
(C) the preposition 'on' (D) over

KEY FOR THE Q.P.-2009

1.	C	2.	D	3.	B	4.	B	5.	D	6.	C	7.	A	8.	B
9.	C	10.	D	11.	A	12.	D	13.	D	14.	B	15.	C	16.	A
17.	D	18.	B	19.	D	20.	B	21.	D	22.	C	23.	A	24.	A
25.	A	26.	B	27.	C	28.	A	29.	A	30.	C	31.	A	32.	B
33.	C	34.	A	35.	C	36.	A	37.	B	38.	D	39.	C	40.	A
41.	C	42.	D	43.	B	44	D	45.	A	46.	A	47.	C	48.	A
49.	C	50.	C	51.	B	52.	A	53.	C	54.	B	55.	C	56.	C
57.	C	58.	A	59.	C	60.	C	61.	D	62.	C	63.	D	64.	A
65.	C	66.	A	67.	B	68.	D	69.	B	70.	C	71.	C	72.	D
73.	A	74.	D	75.	B	76.	C	77.	C	78.	C	79.	C	80.	C
81.	D	82.	C	83.	A	84.	A	85.	D	86.	A	87.	A	88.	C
89.	C	90.	C	91.	B	92.	B	93.	C	94.	D	95.	C	96.	C
97.	D	98.	A	99.	C	100.	A								