

Physics

- A ball is projected upward from the top of tower with a velocity 50 ms^{-1} making angle 30° with the horizontal. The height of tower is 70 m. After how many seconds from the instant of throwing will the ball reach the ground?

(a) 2 s (b) 5 s
(c) 7 s (d) 9 s
(e) None of these
- A pendulum bob of mass 50 g is suspended from the ceiling of an elevator. The tension in the string, if the elevator goes up with uniform velocity is approximately

(a) 0.30 N (b) 0.40 N
(c) 0.42 N (d) 0.50 N
(e) None of these
- 300 J of work is done in sliding up a 2 kg block on an inclined plane to a height of 10 m. Taking value of acceleration due to gravity g to be 10 ms^{-2} , work done against friction is

(a) 100 J (b) 200 J
(c) 300 J (d) zero
(e) None of these
- A 0.5 kg ball is thrown up with an initial speed 14 m/s and reaches a maximum height of 8.0 m. How much energy is dissipated by air drag acting on the ball during the ascent?

(a) 19.6 J (b) 4.9 J
(c) 10 J (d) 9.8 J
(e) None of these
- Three point masses m_1, m_2, m_3 are located at the vertices of an equilateral triangle of length a . The moment of inertia of the system about an axis along the altitude of the triangle passing through m_1 , is

(a) $(m_2 + m_3) \frac{a^2}{4}$
(b) $(m_1 + m_2 + m_3) a^2$
(c) $(m_1 + m_2) \frac{a^2}{4}$
(d) $(m_2 + m_3) a^2$
(e) None of the above
- The escape velocity of a body on an imaginary planet which is thrice the radius of the earth and double the mass of the earth is (v_e is the escape velocity of earth)

(a) $\sqrt{\frac{2}{3}} v_e$ (b) $\sqrt{\frac{3}{2}} v_e$
(c) $\frac{\sqrt{2}}{3} v_e$ (d) $\frac{2}{\sqrt{3}} v_e$
(e) None of these
- A cube of aluminium of sides 0.1 m is subjected to a shearing force of 100 N. The top face of the cube is displaced through 0.02 cm with respect to the bottom face. The shearing strain would be

(a) 0.02 (b) 0.1
(c) 0.005 (d) 0.002
(e) None of these
- Water rises upto 10 cm height in a long capillary tube. If this tube is immersed in water so that the height above the water surface is only 8 cm, then

(a) water flows out continuously from the upper end
(b) water rises upto upper end and forms a spherical surface

- (c) water only rises upto 6 cm height
 (d) water does not rise at all
 (e) None of the above

9. Root mean square velocity of a particle is v at pressure p . If pressure is increased two times, then the rms velocity becomes

- (a) $2v$ (b) $3v$
 (c) $0.5v$ (d) v
 (e) None of these

10. An ideal gas is expanded adiabatically at an initial temperature of 300 K so that its volume is doubled. The final temperature of the hydrogen gas is ($\gamma = 1.40$)

- (a) 227.36 K (b) 500.30 K
 (c) 454.76 K (d) -47°C
 (e) None of these

11. The maximum velocity of a particle executing SHM is v . If the amplitude is doubled and the time period of oscillation decreased to $\frac{1}{3}$ of its original value, the

maximum velocity becomes

- (a) $18v$ (b) $12v$
 (c) $6v$ (d) $3v$
 (e) None of these

12. Equation of a progressive wave is given by

$$y = 0.2 \cos \pi \left(0.04t + 0.02x - \frac{\pi}{6} \right)$$

The distance is expressed in cm and time in second. What will be the minimum distance between two particles having the phase difference of $\frac{\pi}{2}$?

- (a) 4 cm (b) 8 cm
 (c) 25 cm (d) 12.5 cm
 (e) None of these

13. The specific resistance of a wire is ρ , its volume is 3 m^3 and its resistance is 3Ω , then its length will be

- (a) $\sqrt{\frac{1}{\rho}}$ (b) $\frac{3}{\sqrt{\rho}}$
 (c) $\frac{\sqrt{3}}{\rho}$ (d) $\rho \sqrt{\frac{1}{3}}$
 (e) None of these

14. The chemical equivalents of copper and silver are 32 and 108 respectively. When copper and silver voltameters are connected

in series and electric current is passed through for sometime, 1.6 g of copper is deposited. Then, the mass of silver deposited

- will be
 (a) 3.5 g (b) 2.8 g
 (c) 5.4 g (d) 6.2 g
 (e) None of these

15. An electric field of 1500 V/m and a magnetic field of 0.40 Wb/m^2 act on a moving electron. The minimum uniform speed along a straight line, the electron could have is

- (a) $1.6 \times 10^{15} \text{ m/s}$ (b) $6 \times 10^{-16} \text{ m/s}$
 (c) $3.75 \times 10^3 \text{ m/s}$ (d) $3.75 \times 10^2 \text{ m/s}$
 (e) None of these

16. A certain amount of current when flowing in a properly set tangent galvanometer, produces a deflection of 45° . If the current be reduced by a factor of $\sqrt{3}$, the deflection would

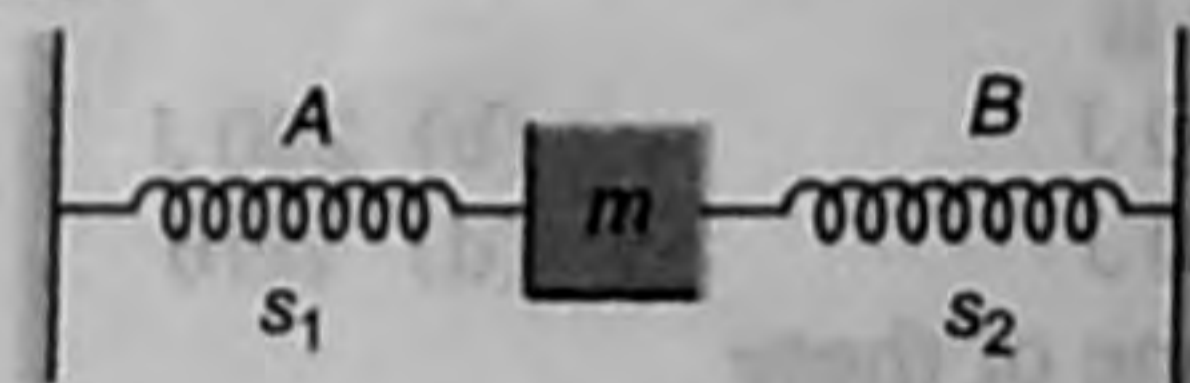
- (a) decrease by 30° (b) decrease by 15°
 (c) increase by 15° (d) increase by 30°
 (e) None of these

17. When an electron in hydrogen atom is excited, from its 4th to 5th stationary orbit, the change in angular momentum of electron is

(Planck's constant $h = 6.6 \times 10^{-34} \text{ J/s}$)

- (a) $4.16 \times 10^{-34} \text{ J-s}$ (b) $3.32 \times 10^{-34} \text{ J-s}$
 (c) $1.05 \times 10^{-34} \text{ J-s}$ (d) $2.08 \times 10^{-34} \text{ J-s}$
 (e) None of these

18. In the figure, S_1 and S_2 are identical springs. The oscillation frequency of the mass m is f . If one spring is removed, the frequency will become



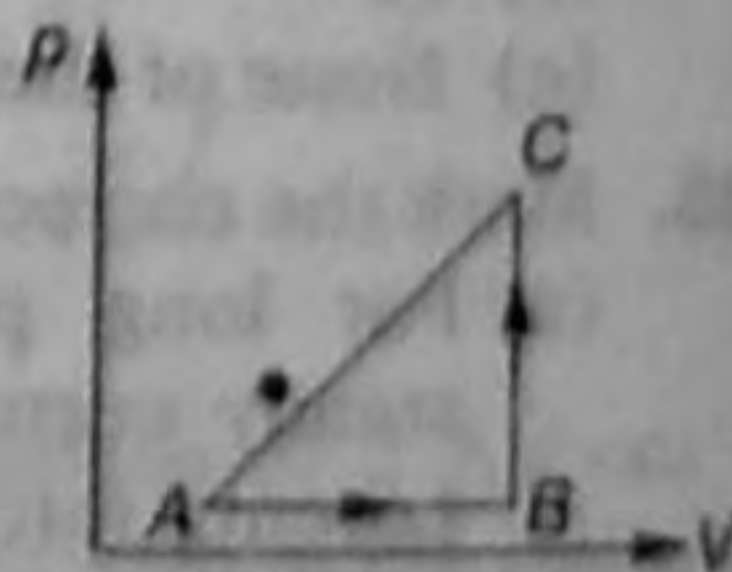
- (a) f (b) $2f$
 (c) $\sqrt{2} f$ (d) $\frac{1}{\sqrt{2}} f$
 (e) None of these

19. When current in a coil changes to 2 A from 8 A in $3 \times 10^{-3} \text{ s}$, the emf induced in the coil is 2 V. The self inductance of the coil in mH is


- (a) 1 (b) 5
 (c) 20 (d) 10
 (e) None of these

20. The half-life of the isotope ${}_{11}\text{Na}^{24}$, is 15 h. How much time does it take for $\frac{7}{8}$ th of a same of this isotope to decay?
- (a) 75 h (b) 65 h
(c) 55 h (d) 45 h
(e) None of these
21. A charged oil drop of mass 9.75×10^{-15} kg and charge 30×10^{-16} C is suspended in a uniform electric field existing between two parallel plates. The field between the plates, taking ($g = 10 \text{ ms}^{-2}$) is
- (a) 3.25 V/m (b) 300 V/m
(c) 325 V/m (d) 32.5 V/m
(e) None of these
22. Which one of the following represents the correct dimensions of the coefficient of viscosity?
- (a) $[\text{ML}^{-1}\text{T}^{-2}]$ (b) $[\text{MLT}^{-1}]$
(c) $[\text{ML}^{-1}\text{T}^{-1}]$ (d) $[\text{ML}^{-2}\text{T}^{-2}]$
(e) None of these
23. At what distance along the central axis of a uniformly charged plastic disc of radius R is the magnitude of the electric field equal to one-half the magnitude of the field at the centre of the surface of the disc?
- (a) $\frac{R}{\sqrt{2}}$ (b) $\frac{R}{\sqrt{3}}$
(c) $\sqrt{2}R$ (d) $\sqrt{3}R$
(e) None of these
24. A moving oil galvanometer has 150 equal divisions. Its current sensitivity is 10 divisions per milliampere and voltage sensitivity is 2 divisions per millivolt. In order that each division reads 1 V the resistance in ohm needed to be connected in series with the coil will be
- (a) 99995 (b) 9995
(c) 10^3 (d) 10^5
(e) None of these
25. Mark the correct statement.
- (a) For long parallel conductors carrying steady current, the Biot-Savart law and Lorentz force yield results in accordance with Newton's third law
(b) For long parallel conductors carrying steady current, the Biot-Savart law and Lorentz force, Newton's third law does not hold good
- (c) For long parallel conductors carrying time varying currents, the Biot-Savart law and Lorentz force, Newton's third law holds good
(d) Both (a) and (c) are correct
(e) None of the above
26. 0.3 kg of hot coffee, which is at 70°C , is poured into a cup of mass 0.12 kg. Find the final equilibrium temperature. Take room temperature as 20°C ,
 $s_{\text{coffee}} = 4080 \text{ J/kg-K}$ and $s_{\text{cup}} = 1020 \text{ J/kg-K}$.
- (a) 45.5°C (b) 55.5°C
(c) 65.5°C (d) 40.5°C
(e) None of these
27. A uniform rectangular marble slab is 3.4 m long and 2.0 m wide. It has a mass of 180 kg. If it is originally lying on the flat ground, how much work is needed to stand it on an end?
- (a) 2.0 kJ (b) 3.0 J
(c) 3.0 kJ (d) 3000 kJ
(e) None of these
28. A train is moving along a straight path with uniform acceleration. Its engine passes across a pole with a velocity of 60 kmh^{-1} and the end (guard's van) passes across same pole with a velocity of 80 kmh^{-1} . The middle point of the train will pass across same pole with a velocity
- (a) 70 kmh^{-1} (b) 70.7 kmh^{-1}
(c) 65 kmh^{-1} (d) 75 kmh^{-1}
(e) None of these
29. A weight of 290 N and another of 200 N are suspended by a rope on either side of a frictionless pulley. The acceleration of each weight is
- (a) 1.5 m/s^2 (b) 1.8 m/s^2
(c) 2.2 m/s^2 (d) 2.5 m/s^2
(e) None of these
30. In a simple pendulum, the breaking strength of the string is doubled the weight of the bob. The bob is released from rest when the string is horizontal. The string breaks when it makes an angle θ with the vertical
- (a) $\theta = \cos^{-1}\left(\frac{1}{3}\right)$ (b) $\theta = \cos^{-1}\left(\frac{2}{3}\right)$
(c) $\theta = 60^\circ$ (d) $\theta = \text{zero}$
(e) None of these

31. The current gain α of a transistor is 0.95. The change in emitter current is 10 mA. The change in base current is
 (a) 9.5 mA (b) 0.5 mA
 (c) 10.5 mA (d) $\left(\frac{200}{19}\right)$ mA
 (e) None of these
32. How much work per kilogram need to be done to shift a 1 kg mass from the surface of the earth to the infinity? (Take acceleration due to gravity = g , and radius of the earth = R)
 (a) $\frac{g}{R}$ (b) Rg
 (c) gR^2 (d) $\frac{g}{R^2}$
 (e) None of these
33. To produce an achromatic combination, a convex lens of focal length 42 cm and dispersive power 0.14 is placed in contact with a concave lens of dispersive power 0.21. The focal length of the concave lens is
 (a) 21 cm (b) 42 cm
 (c) 63 cm (d) 84 cm
 (e) None of these
34. Two resistances are connected in two gaps of a metre bridge. The balance point is 20 cm from the zero end. A resistance of 15Ω is connected in series with the smaller of the two. The null point shifts to 40 cm. The value of the smaller resistance in ohm is
 (a) 3 (b) 6
 (c) 9 (d) 12
 (e) None of these
35. A gas at pressure $6 \times 10^5 \text{ N/m}^2$ and volume 1 m^3 expands to 3 m^3 and its pressure falls to $4 \times 10^5 \text{ N/m}^2$. Given that the indicator diagram is a straight line, work done by the system is
 (a) $6 \times 10^5 \text{ J}$ (b) $3 \times 10^5 \text{ J}$
 (c) $4 \times 10^5 \text{ J}$ (d) $10 \times 10^5 \text{ J}$
 (e) None of these
36. 5 heat/s are produced on blowing together two closed organ pipes of the same diameter but of different lengths. If shorter pipe is of 10 cm length and speed of sound in air is 300 m/s, length of other pipe is
 (a) 10.06 cm (b) 11.22 cm
 (c) 16 cm (d) 14 cm
 (e) None of these
37. A ball after falling freely from a height of 4.9 m strikes a horizontal plane. If the coefficient of restitution is $\frac{3}{4}$, the ball will strike second time with the plane after
 (a) $\frac{1}{2}$ s (b) 1 s
 (c) $\frac{3}{2}$ s (d) $\frac{3}{4}$ s
 (e) None of these
38. When ω_m is the modulation frequency in frequency modulation, the modulation index is proportional to
 (a) ω_m (b) ω_m^2
 (c) $\frac{1}{\omega_m}$ (d) $\frac{1}{\omega_m^2}$
 (e) None of these
39. Capacitance of a capacitor becomes $\frac{4}{3}$ times its original value, if a dielectric slab of thickness, $t = \frac{d}{2}$ is inserted between the plates ($d =$ separation between the plates). The dielectric constant of the slab is
 (a) 6 (b) 8
 (c) 4 (d) 2
 (e) None of these
40. The speed of earth's rotation about its axis is ω . Its speed increases to x times to make effective acceleration due to gravity equal to zero at the equator, x is
 (a) 1 (b) 8.5
 (c) 17 (d) 34
 (e) None of these
41. The p - V diagram of a system undergoing thermodynamic transformation is shown in figure. The work done by the system in going from $A \rightarrow B \rightarrow C$ is 50 J and 20 cal heat is given to the system. The change in internal energy between A and C is
 (a) 34 J (b) 70 J
 (c) 84 J (d) 134 J
 (e) None of these

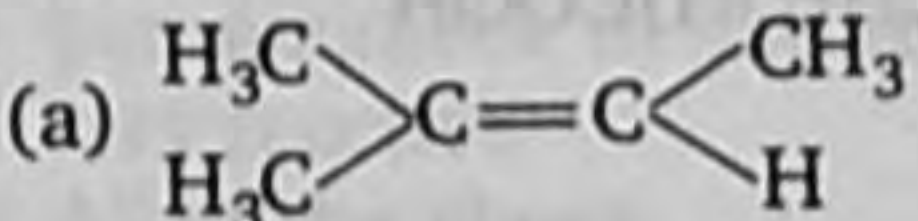
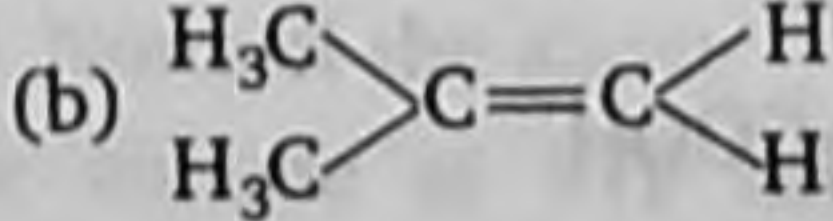
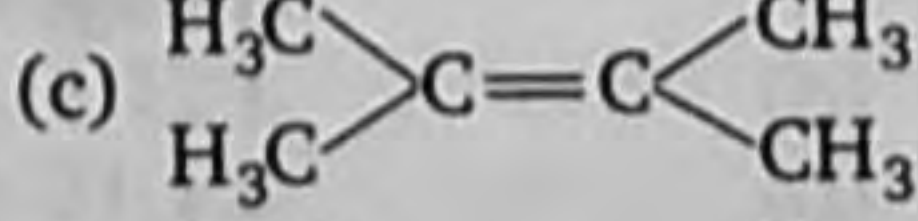
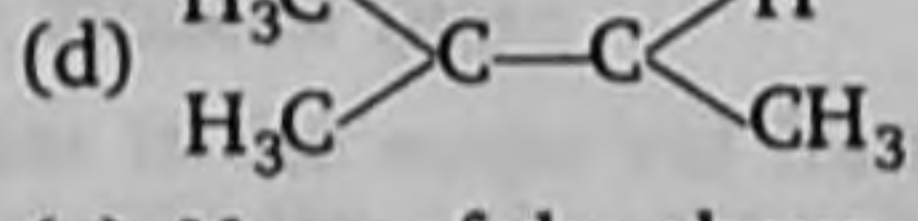
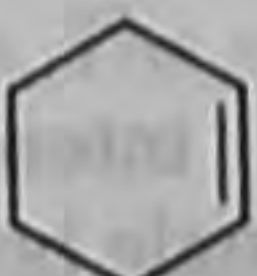

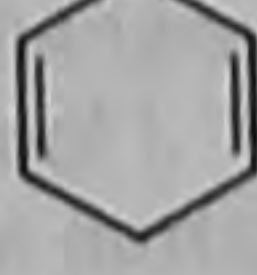
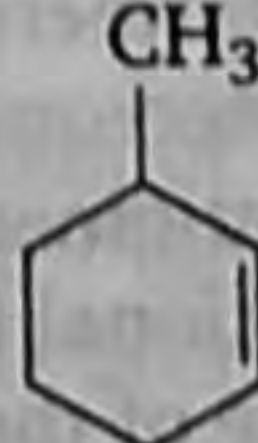


42. The coefficient of performance of a Carnot's refrigerator working between 30°C and 0°C is
 (a) 10 (b) 1
 (c) 9 (d) zero
 (e) None of these
43. A helium nucleus makes full rotation in a circle of radius 0.8 m in 2 s. The value of magnetic field B at the centre of the circle, will be ($\mu_0 =$ permeability constant)
 (a) $\frac{2 \times 10^{-19}}{\mu_0}$ (b) $2 \times 10^{-19} \mu_0$
 (c) $10^{-19} \mu_0$ (d) $\frac{10^{-19}}{\mu_0}$
 (e) None of these
44. The luminous intensity of lamp which produces an illuminance of 12 lux at a distance of 5 m from it, is
 (a) 4 cd (b) 60 cd
 (c) 300 cd (d) 720 cd
 (e) None of these
45. Surface tension vanishes at
 (a) absolute zero temperature
 (b) transition temperature
 (c) critical temperature
 (d) constant temperature
 (e) None of the above
46. A sounding source of frequency 500 Hz moves towards a stationary observer with a velocity 30 m/s. If the velocity of sound in air is 330 m/s, find the frequency heard by the observer.
 (a) 500 Hz (b) 550 Hz
 (c) 355 Hz (d) 55.5 Hz
 (e) None of these
47. At what height h above earth, the value of g becomes? $\frac{g}{2}$ ($R =$ Radius of earth)
 (a) $3R$ (b) $\sqrt{2}R$
 (c) $(\sqrt{2} - 1)R$ (d) $\frac{1}{\sqrt{2}}R$
 (e) None of these
48. The angle of minimum deviation δ_m for an equilateral glass prism is 30° . Refractive index of the prism is
 (a) $\frac{1}{\sqrt{2}}$ (b) $\sqrt{2}$
 (c) $2\sqrt{2}$ (d) $\frac{1}{2\sqrt{2}}$
 (e) None of these
49. Two bulbs 40 W and 60 W and rated voltage 240 V are connected in series across a potential difference of 420 V. Which bulb will work at above its rated voltage?
 (a) 40 W bulb (b) 60 W bulb
 (c) Both will work (d) 20 W bulb
 (e) None of these
50. Two wires of lengths l and $2l$, radii r and $2r$ respectively having same Young's modulus are hung with a weight mg . Net elongation is
 (a) $\frac{3mgl}{\pi r^2 Y}$ (b) $\frac{2mgl}{3\pi r^2 Y}$
 (c) $\frac{3mgl}{2\pi r^2 Y}$ (d) $\frac{5mgl}{4\pi r^2 Y}$
 (e) None of these
51. A gas is suddenly expanded such that its final volume becomes 3 times its initial volume. If the specific heat at constant volume of the gas is $2R$, then the ratio of initial to final pressures is nearly equal to
 (a) 5 (b) 6.5
 (c) 7 (d) 3.5
 (e) None of these
52. Two points on a travelling wave having frequency 500 Hz and velocity 300 m/s are 60° out of phase, then the minimum distance between the two points is
 (a) 0.2 (b) 0.1
 (c) 0.5 (d) 0.4
 (e) None of these
53. The displacement x of a particle varies with time t as $x = ae^{-\alpha t} + be^{\beta t}$, where a, b, α and β are positive constants. The velocity of the particle will
 (a) be independent of α and β
 (b) go on increasing with time
 (c) drop to zero when $\alpha = \beta$
 (d) go on decreasing with time
 (e) None of the above
54. An aeroplane is moving north horizontally, with a speed of 200 ms^{-1} , at a place where the vertical component of the earth's magnetic field is $0.5 \times 10^{-4} \text{ T}$. What is the induced emf set up between the tips of the wings if they are 10 m apart?
 (a) 0.01 V (b) 0.1 V
 (c) 1 V (d) 10 V
 (e) None of these

55. Out of the following electromagnetic radiations, which has the shortest wavelength?
 (a) Radiowaves (b) Infrared
 (c) Ultraviolet (d) X-rays
 (e) None of these
56. The power of the combination of a convex lens of focal length 50 cm and concave lens of focal length 40 cm is
 (a) +1 D (b) -1 D
 (c) zero (d) -0.5 D
 (e) None of these
57. Two cars A and B approach a stationary observer from opposite sides as shown in figure. Observer hears no beats. If the frequency of the horn of the car B is 504 Hz, the frequency of horn of car A will be
- 
- (a) 529.2 Hz (b) 295.2 Hz
 (c) 440.5 Hz (d) 259.2 Hz
 (e) None of these
58. On a particular day, the maximum frequency reflected from the ionosphere is 9 MHz. On another day, it was found to increase by 1 MHz. What is the ratio of the maximum electron densities of the ionosphere on the two days?
 (a) 1.23 (b) 1.0
 (c) 1.43 (d) 0.75
 (e) None of these
59. A body cools in 7 min from 60°C to 40°C. What time (in min) does it take to cool from 40°C to 28°C, if surrounding temperature is 10°C? (Assume Newton's law of cooling)
 (a) 3.5 (b) 14
 (c) 7 (d) 10
 (e) None of these
60. If both the mass and radius of earth, each decreases by 50%, the acceleration due to gravity would
 (a) remain same
 (b) decrease by 50%
 (c) decrease by 100%
 (d) increase by 100%
 (e) None of the above

Chemistry

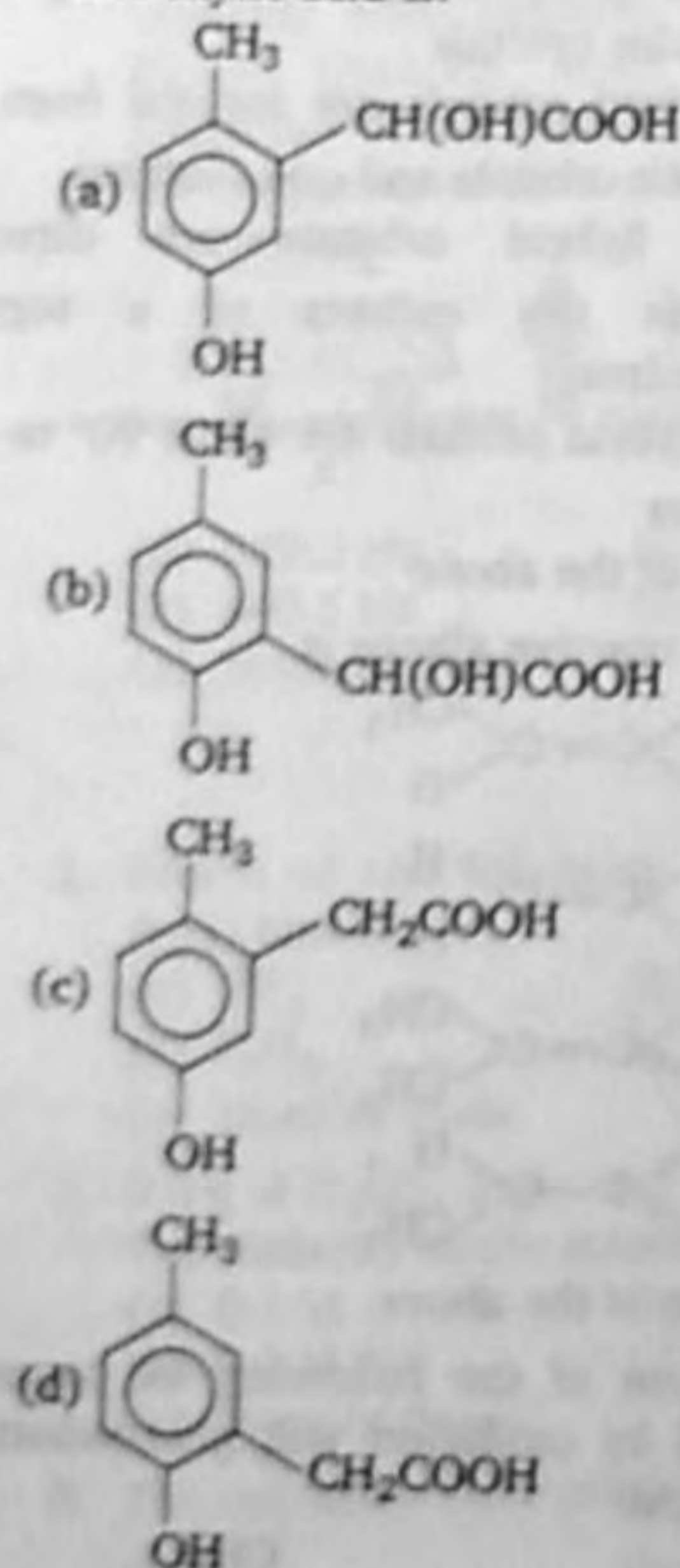
1. Which of the following has least covalent P—H bond?
 (a) PH_3 (b) P_2H_6
 (c) P_2H_5 (d) PH_6^+
 (e) None of these
2. 9.8 g of H_2SO_4 is present in 2 L of a solution. The molarity of the solution is
 (a) 0.1 M (b) 0.05 M
 (c) 0.2 M (d) 0.01 M
 (e) None of these
3. The oxidation state of nitrogen in N_3H is
 (a) $+\frac{1}{2}$ (b) +4
 (c) +1 (d) $-\frac{1}{3}$
 (e) None of these
4. Which of the following is the smallest in size?
 (a) Na^+ (b) F^-
 (c) O^{2-} (d) NH_3
 (e) None of these
5. Which of the following ligand has lowest Δ_o value?
 (a) CN^- (b) CO
 (c) F^- (d) NH_3
 (e) None of these
6. Arsenic sulphide sol is negatively charged. Which of the following electrolytes would be most effective in its coagulation?
 (a) BaCl_2 (b) NaCl
 (c) MgSO_4 (d) AlCl_3
 (e) None of these
7. Which of the following groups of ions will make the water hard?
 (a) Sodium and bicarbonate
 (b) Magnesium and sulphate
 (c) Potassium and sulphate
 (d) Ammonium and chloride
 (e) None of the above
8. In the nitrate ion, NO_3^-
 (a) one N—O bond is shorter than the other two equal bonds

- (b) one N—O bond is longer than the other two equal bonds
 (c) all the N—O bonds are equal in length
 (d) all the N—O bonds are unequal in length
 (e) None of the above
9. Zinc does not show variable valency like *d*-block elements because
 (a) it is low melting
 (b) its *d*-orbital is complete
 (c) it is a soft metal
 (d) two electrons are present in the outermost orbit
 (e) None of the above
10. Percentage of *ortho* and *para* hydrogen in ordinary H₂ at room temperature is
 (a) 75% *ortho*-hydrogen + 25% *para*-hydrogen
 (b) 25% *ortho*-hydrogen + 75% *para*-hydrogen
 (c) 50% *ortho*-hydrogen + 50% *para*-hydrogen
 (d) 1% *ortho*-hydrogen + 99% *para*-hydrogen
 (e) None of the above
11. Consider two elements with atomic no. 37 and 53, the bond between their atoms would be
 (a) covalent (b) ionic
 (c) coordinate (d) metallic
 (e) None of these
12. The order of reactivities of the following alkyl halides for a S_N2 reaction is
 (a) RF > RCl > RBr > RI
 (b) RF > RBr > RCl > RI
 (c) RCl > RBr > RF > RI
 (d) RI > RBr > RCl > RF
 (e) None of the above
13. The carbohydrate which is an essential constituent of animal cell is
 (a) sucrose (b) starch
 (c) glycogen (d) vitamin
 (e) None of these
14. The structure of DNA is
 (a) double helix (b) triple helix
 (c) single helix (d) linear
 (e) None of these
15. 4 g of hydrocarbon on complete combustion gave 12.571 g of CO₂ and 5.143 g of water. What is the empirical formula of the hydrocarbon?
 (a) CH (b) C₂H₃
 (c) CH₂ (d) CH₃
 (e) None of these
16. Carbon monoxide, emitted by automobiles, prevents transport of oxygen in body due to
 (a) combining with oxygen to form carbon dioxide
 (b) destruction of haemoglobin
 (c) preventing reaction between oxygen and haemoglobin
 (d) forming stable compound with haemoglobin
 (e) None of the above
17. Which of the following statements is not correct?
 (a) Hybridisation is the mixing of atomic orbitals prior to their combining into molecular orbitals
 (b) sp² hybrid orbitals are formed from two *p*-atomic orbitals and one *s*-orbital.
 (c) d²sp³ hybrid orbitals are directed towards the corners of a regular octahedron
 (d) sp³d hybrid orbitals are all at 90° to one another
 (e) None of the above
18. The least reactive alkene is
 (a) 
 (b) 
 (c) 
 (d) 
 (e) None of the above
19. Which one of the following on ozonolysis followed by oxidation will give substituted adipic acid?
 (a) 
 (b) 
 (c) 
 (d) 
 (e) None of these

20. 250 mL of nitrogen maintained at 720 mm pressure and 380 mL of oxygen maintained at 650 mm pressure are put together in 1 L flask. If the temperature is kept constant, what will be the final pressure of the mixture?

- (a) 427 mm (b) 472 mm
(c) 319 mm (d) 913 mm
(e) None of these

21. *p*-cresol reacts with chloroform in alkaline medium to give the compound A which adds hydrogen cyanide to form the compound B. The later on hydrolysis gives chiral carboxylic acid. The structure of the carboxylic acid is.



(e) None of the above

22. Isomers which can be interconverted through rotation around a single bond are

- (a) conformers
(b) diastereomers
(c) enantiomers
(d) positional isomers
(e) None of the above

23. The most suitable reagent for the conversion of $RCH_2OH \rightarrow RCHO$ is

- (a) $KMnO_4$
(b) $K_2Cr_2O_7$
(c) CrO_3
(d) PCC (pyridine chloro chromate)
(e) None of the above

24. The S in Buna-S refers to

- (a) sulphur (b) styrene
(c) sodium (d) just a trade name
(e) None of these

25. What is azote?

- (a) Oxygen (b) Nitrogen
(c) Sulphur (d) Argon
(e) None of these

26. Which one of the following is correct statement?

- (a) The hydroxide of aluminium is more acidic than that of boron
(b) The hydroxide of boron is basic, while that of aluminium is amphoteric
(c) The hydroxide of boron is acidic, while that of aluminium is amphoteric
(d) The hydroxide of boron and aluminium are amphoteric
(e) None of the above

27. In the transformation of ${}_{92}U^{238}$ to ${}_{92}U^{234}$, if one emission is an α -particle, what should be the other emission?

- (a) two β^-
(b) two β^- and one β^+
(c) one β^- and one γ
(d) one β^+ and one β^-
(e) None of the above

28. T-shaped interhalogen compound is

- (a) ClF_3 (b) ICl
(c) ClF_5 (d) IF_5
(e) None of these

29. In Hall's process, the main reagent is mixed with

- (a) NaF (b) Na_3AlF_6
(c) AlF_3 (d) $NaAlF_3$
(e) None of these

30. Maximum basic in gas phase is

- (a) NH_3 (b) $CH_3CH_2NH_2$
(c) $(CH_3CH_2)_2NH$ (d) $(CH_3CH_2)_3N$
(e) None of these

31. Increasing the temperature of an aqueous solution will cause
 (a) decrease in molarity
 (b) decrease in molality
 (c) decrease in mole fraction
 (d) decrease in % w/w
 (e) None of the above
32. In a cubic lattice of XYZ, X atoms are present at all corners except one corner which is occupied by Y atoms. Z atoms are present at face centres. The formula of the compound is
 (a) X_8YZ_{24} (b) XYZ_3
 (c) $X_7Y_{24}Z$ (d) X_7YZ_{24}
 (e) None of these
33. The wavelength associated with an electron (mass 9.1×10^{-31} kg) moving with a velocity of 10^3 ms⁻¹ ($h = 6.6 \times 10^{-34}$ kg m²s⁻¹) is
 (a) 72.5×10^{-7} m (b) 6.25×10^{-7} m
 (c) 7.25×10^{-7} m (d) 62.5×10^{-7} m
 (e) None of these
34. K_p for the reaction, $N_2O_4(g) \rightleftharpoons 2NO_2(g)$ is 0.157 atm at 27°C and 1 atm pressure. K_c for this reaction is
 (a) 6.37×10^{-3} (b) 4.29×10^{-3}
 (c) 5.62×10^{-3} (d) 4.37×10^{-3}
 (e) None of these
35. 10 g of O₂ were introduced into an evacuated vessel of 5 L capacity maintained at 27°C. What is the pressure of the gas in atmospheres in the container?
 (a) 2.02 atm (b) 1.54 atm
 (c) 1.02 atm (d) 5.24 atm
 (e) None of these
36. The coagulation of 100 mL of a colloidal solution of gold is completely prevented by the addition of 0.25 g of starch to it before adding 1 mL of 10% NaCl solution. What is the gold number of starch?
 (a) 5 (b) 10
 (c) 30 (d) 25
 (e) None of these
37. 0.01 M solution of KCl and BaCl₂ are prepared in water. The freezing points of KCl is found to be -2°C. What freezing point would you expect for BaCl₂ solution assuming both KCl and BaCl₂ to be completely ionised?
 (a) -3°C (b) -2°C
 (c) 3°C (d) 2°C
 (e) None of these
38. Which alkyl halide is most reactive towards S_N1 mechanism?
 (a) (CH₃)₃C·Cl (b) CH₃CH₂CH₂Cl
 (c) CH₃CH₂Cl (d) CH₃Cl
 (e) None of these
39. Acetaldehyde gives orange coloured precipitate on treatment with
 (a) 2, 4-DNP (b) NH₂OH
 (c) NaHSO₃ (d) NaOH
 (e) None of these
40. The reagent used in Gattermann-Koch aldehyde synthesis is
 (a) Pd/BaSO₄ (b) alkaline KMnO₄
 (c) acidic KMnO₄ (d) CO + HCl
 (e) None of these
41. Tertiary alcohols (3°) having at least four carbon atoms upon drastic oxidation yield carboxylic acid with
 (a) one carbon atom less
 (b) two carbon atoms less
 (c) three carbon atoms less
 (d) All the above three options are correct
 (e) None of the above
42. The molecule NO is described as
 (a) an odd electron molecule
 (b) paramagnetic in nature
 (c) very reactive
 (d) All of the above
 (e) None of the above
43. The volume at STP occupied by 14 g of nitrogen is
 (a) 1.12 L (b) 11.2 L
 (c) 21.1 L (d) 12.1 L
 (e) None of these
44. What is the empirical formula of vanadium oxide if 2.74 g of metal oxide contains 1.53 g of metal?
 (a) V₂O₃ (b) VO
 (c) V₂O₅ (d) V₂O₇
 (e) None of these
45. The radius of Na⁺ is 95 pm and that of Cl⁻ is 181 pm. The coordination number of Na⁺ is
 (a) 8 (b) 6
 (c) 4 (d) unpredictable
 (e) None of these
46. In a reaction the concentration of a reactant [A] changes from 0.200 mol L⁻¹ to 0.150 mol L⁻¹ in 10 min. The average rate of reaction during this interval is
 (a) 0.5 mol L⁻¹ min⁻¹

- (b) $0.005 \text{ mol L}^{-1} \text{ min}^{-1}$
 (c) $0.35 \text{ mol L}^{-1} \text{ min}^{-1}$
 (d) $0.850 \text{ mol L}^{-1} \text{ min}^{-1}$
 (e) None of the above

47. 'Lead pencil' contains

- (a) PbS (b) FeS
 (c) graphite (d) Pb
 (e) None of these

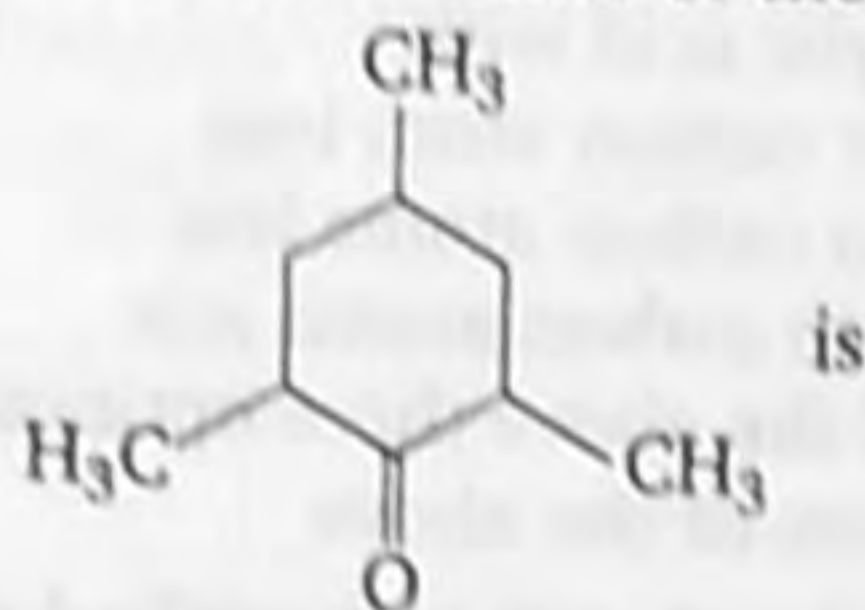
48. Sugar of lead is

- (a) $2\text{PbSO}_4 \cdot \text{PbO}$ (b) $\text{PbCO}_3 \cdot \text{Pb(OH)}_2$
 (c) PbCO_3 (d) $(\text{CH}_3\text{COO})_2\text{Pb}$
 (e) None of these

49. Halon-1301 is

- (a) $\text{CCl}_2\text{F} \cdot \text{CClF}_2$ (b) $\text{C}_2\text{F}_4\text{Br}_2$
 (c) CCl_3F (d) CF_3Br
 (e) None of these

50. The correct IUPAC name of the compound

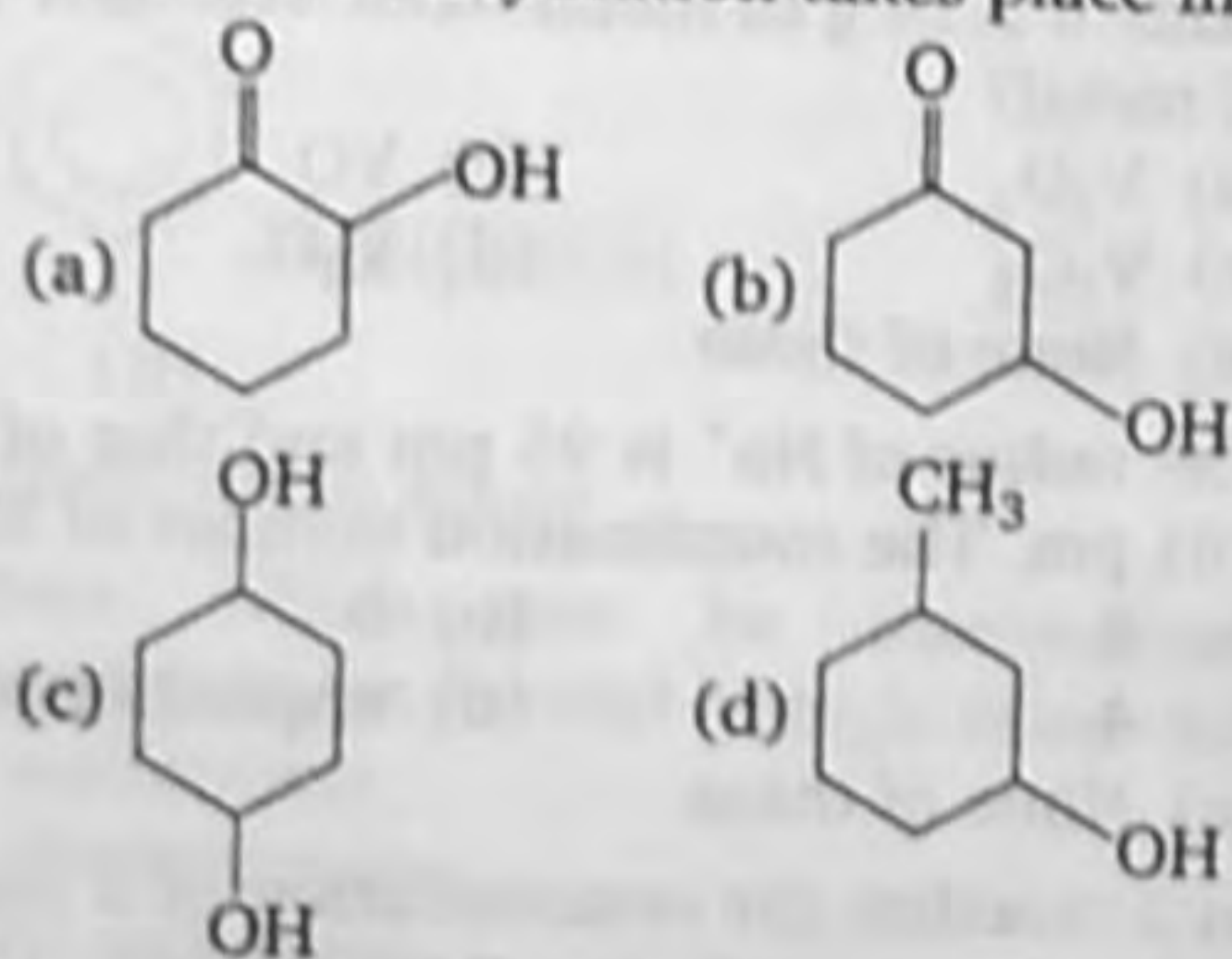


- (a) trimethyl cyclobutanone
 (b) 1, 3, 5-trimethyl benzophenone
 (c) 1-keto-2, 4, 6-trimethyl cyclohexene
 (d) 2, 4, 6-trimethyl cyclohexanone
 (e) None of the above

51. CCl_4 is used as a fire extinguisher because

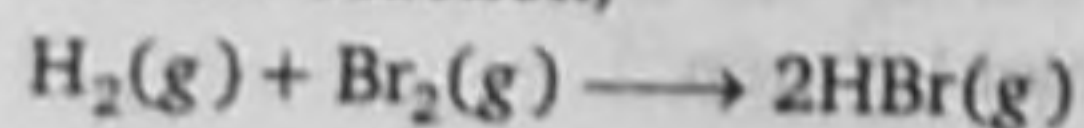
- (a) of its covalent bond
 (b) of its low boiling point
 (c) of its high melting point
 (d) it gives incombustible vapours
 (e) None of the above

52. Maximum dehydration takes place in that of



- (e) None of the above

53. For the reaction,



The experimental data suggests
 $\text{rate} = k[\text{H}_2][\text{Br}_2]^{1/2}$

The order of the reaction is

- (a) $\frac{1}{2}$ (b) 1
 (c) 3 (d) $\frac{3}{2}$

(e) None of these

54. The IUPAC name of $[\text{Co}(\text{NH}_3)_5\text{ONO}]^{2+}$ ion is

- (a) pentamminenitritocobalt (IV) ion
 (b) pentamminenitritocobalt (III) ion
 (c) pentamminenitrocobalt (III) ion
 (d) pentamminenitrocobalt (IV) ion
 (e) None of the above

55. Formation of in-numberable compounds of carbon is due to its

- (a) high reactivity
 (b) catenation tendency
 (c) covalent and ionic tendency
 (d) different valency
 (e) None of the above

56. The colour of blue glass is due to the presence of oxide of

- (a) Cr (b) Co
 (c) Au (d) Ag
 (e) None of these

57. Glass is a

- (a) micro crystalline solid
 (b) gel
 (c) super cooled liquid
 (d) polymeric mixture
 (e) None of the above

58. The drug used for prevention of heart attack is

- (a) aspirin (b) valium
 (c) chloramphenicol (d) cephalosprin
 (e) None of these

59. Which of the following pairs has both members of the same period of the Periodic Table?

- (a) Na-Cl (b) Na-Ca
 (c) Ca-Cl (d) Cl-Br
 (e) None of these

60. Plaster of Paris is a white powder of formula

- (a) $\text{CaSO}_4 \cdot \frac{3}{2}\text{H}_2\text{O}$ (b) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$
 (c) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ (d) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 (e) None of these

Biology

1. Coelomate animal in which blastopore develops into anus is called
 - (a) proterostomia
 - (b) deuterostomia
 - (c) blastostomia
 - (d) diastomia
 - (e) None of these
2. Cell respiration is carried out by
 - (a) ribosome
 - (b) mitochondria
 - (c) chloroplast
 - (d) Golgi bodies
 - (e) None of these
3. In the *lac*-operon model, lactose molecules function as
 - (a) inducers, which bind with the operator gene
 - (b) repressors, which bind with the operator gene
 - (c) inducers which bind with the repressor protein
 - (d) corepressors which bind with repressor protein
 - (e) None of the above
4. A recessive mutant is one which is
 - (a) not expressed
 - (b) rarely expressed
 - (c) expressed only in homozygous and hemizygous state
 - (d) expressed only in heterozygous state
 - (e) None of the above
5. Humoral immunity system is mediated by
 - (a) B-cells
 - (b) T-cells
 - (c) NK-cells
 - (d) plasma cells
 - (e) None of these
6. Bhopal gas tragedy occurred in
 - (a) 1982
 - (b) 1984
 - (c) 1986
 - (d) 1988
 - (e) None of these
7. Cell plate formation starts from
 - (a) phragmoplast
 - (b) epiplast
 - (c) tonoplast
 - (d) protoplast
 - (e) None of these
8. AUG codes for
 - (a) valine
 - (b) histidine
 - (c) phenylalanine
 - (d) methionine
 - (e) None of the above
9. Fluid mosaic model of plasma membrane was given by
 - (a) Robertson
 - (b) Robert Hooke
 - (c) Singer and Nicholson
 - (d) Pantin and Mast
 - (e) Sutton and Boveri
10. Corpus luteum secretes
 - (a) progesterone
 - (b) oestrogen
 - (c) luteinising hormone
 - (d) follicle stimulating hormone
 - (e) None of the above
11. Which of the following is a day neutral plant?
 - (a) *Helianthus annuus*
 - (b) *Euphorbia pulcherrima*
 - (c) *Avena sativa*
 - (d) *Beta vulgaris*
 - (e) None of the above
12. Moisturising gel is obtained from
 - (a) *Aloe vera*
 - (b) *Saraca indica*
 - (c) *Acacia vistina*
 - (d) *Avena sativa*
 - (e) None of these
13. Halophytes are
 - (a) fire resistant
 - (b) cold resistant
 - (c) salt resistant
 - (d) sand loving
 - (e) None of these
14. Clamp connection is found in
 - (a) Basidiomycetes
 - (b) Ascomycetes
 - (c) Saccharomycetes
 - (d) Haplomycetes
 - (e) None of the above
15. Natural genetic engineer is
 - (a) *Bacillus subtilis*
 - (b) *Pseudomonas sp.*
 - (c) *Escherichia coli*
 - (d) *Agrobacterium tumefaciens*
 - (e) None of the above
16. Water vascular system found in
 - (a) Mollusca
 - (b) Arthropoda
 - (c) Annelida
 - (d) Echinodermata
 - (e) None of these
17. Cerebrospinal fluid is secreted by
 - (a) cerebellum
 - (b) choroid plexus
 - (c) olfactory lobe
 - (d) cerebrum
 - (e) None of these
18. Raphides found in aroids are
 - (a) calcium pectate
 - (b) calcium oxalate
 - (c) calcium carbonate
 - (d) calcium sulphate
 - (e) None of these

19. Sucrose, a common table sugar is composed of
 (a) glucose and fructose
 (b) glucose and galactose
 (c) fructose and galactose
 (d) glucose
 (e) None of the above
20. Desert grasses often roll their leaves due to presence of
 (a) oily surface
 (b) bulliform cells
 (c) spines
 (d) Both (b) and (c)
 (e) None of the above
21. F_1 -particles are present in
 (a) chloroplast (b) mitochondria
 (c) ribosome (d) rough ER
 (e) None of these
22. In which phase proteins for spindle fibre formation are synthesised?
 (a) G_1 -phase (b) G_2 -phase
 (c) S-phase (d) Anaphase
 (e) None of these
23. In oxidative photophosphorylation, the last steps are as follows
 $Q \rightarrow C \rightarrow aa_3 \rightarrow O_2$
 (a) $Q \rightarrow C$ is H^+ absorbing site
 (b) $aa_3 \rightarrow O_2$, H^+ yielding site
 (c) $Q \rightarrow C$ is H^+ yielding site and $aa_3 \rightarrow O_2$ is H^+ absorbing site
 (d) no H^+ is absorbed or released
 (e) None of the above
24. Neurons of people suffering from diabetes insipidus do not secrete
 (a) enzyme (b) steroid
 (c) fatty acid (d) ADH
 (e) None of these
25. Which is an autoimmune disease?
 (a) Cancer
 (b) Asthma
 (c) Erythroblastosis foetalis
 (d) Rheumatoid arthritis
 (e) Both (b) and (c)
26. In dicot stem, vascular bundles are
 (a) numerous scattered
 (b) arranged in a ring
 (c) without cambium
 (d) surrounded by bundle sheath
 (e) None of the above
27. What is the first step in the Southern blot technique?
 (a) Denaturation of DNA on the gel for hybridisation with specific probe
 (b) Production of a group of genetically identical cells
 (c) Digestion of DNA by restriction enzyme
 (d) Denaturation of DNA from a nucleated cell such as the one from the scene of crime
 (e) None of the above
28. Insulin and glucagon are transported to target organ by
 (a) lymph (b) blood
 (c) pancreatic duct (d) cystic duct
 (e) None of these
29. Which one of the following is correctly matched regarding an Institute and its location?
 (a) National Institute of Virology—Pune
 (b) National Institute of Communicable Disease—Lucknow
 (c) Central Drug Research Institute—Kasauli
 (d) National Institute of Nutrition—Mumbai
 (e) None of the above
30. Chloragogen cells in alimentary canal of earthworm is.....in nature.
 (a) respiratory (b) circulatory
 (c) excretory (d) polyfunctional
 (e) sensory
31. The condition where filaments and anthers are fused throughout the entire length is
 (a) synandrous (b) gynandrous
 (c) protandrous (d) syngenesious
 (e) None of these
32. Arrhenotoky is related to
 (a) parthenogenesis
 (b) wax formation
 (c) organogenesis
 (d) Both (a) and (b)
 (e) None of the above
33. Which is not true for anaphase?
 (a) Golgi body and ER are reformed
 (b) Chromosomes move to opposite poles
 (c) Spindle poles move farther apart
 (d) Centromeres split and chromatids separate
 (e) None of the above

34. Jute fibre deteriorates quickly due to presence of
 (a) high cellulose (b) low cellulose
 (c) high lignin (d) low lignin
 (e) None of these
35. Most diversified family of monocot is
 (a) Liliaceae (b) Orchidaceae
 (c) Lamiaceae (d) Brassicaceae
 (e) None of these
36. Which has double-stranded RNA?
 (a) Cauliflower mosaic virus
 (b) TMV
 (c) $\phi \times 174$
 (d) Reovirus
 (e) None of the above
37. Bacterial blight of rice is caused due to
 (a) *Xanthomonas oryzae*
 (b) *Helminthosporium oryzae*
 (c) *Pseudomonas falcatum*
 (d) *Xanthomonas falcatum*
 (e) None of the above
38. Modified stem present in *Gladiolus* is
 (a) bulb (b) rhizome
 (c) corm (d) bulbil
 (e) None of these
39. Binomial nomenclature of plants was given by
 (a) Engler (b) Linnaeus
 (c) Prantl (d) Both (a) and (c)
 (e) None of these
40. Female reproductive part of bryophytes is
 (a) antheridium (b) oogonium
 (c) archegonium (d) sporangium
 (e) None of these
41. When flowering is regulated by length of day and night, it is called
 (a) photoperiodism (b) phototropism
 (c) nyctinasty (d) seismonasty
 (e) None of these
42.acts as a shock absorber to cushion when tibia and femur came together.
 (a) Ligament (b) Cartilage
 (c) Tendon (d) Disc
 (e) Both (b) and (c)
43. Amoebic dysentery is caused due to
 (a) *Escherichia coli*
 (b) *Amoeba proteus*
 (c) *Entamoeba histolytica*
 (d) *Plasmodium vivax*
 (e) None of the above
44. Which one of the following is not a characteristic feature of bryophytes?
 (a) Dominant gametophytic generation
 (b) Filamentous rhizoids
 (c) Sporophytic generation independent
 (d) Presence of vascular tissues
 (e) None of the above
45. Frequency of Down's syndrome increased when the maternal age is
 (a) above 35 years
 (b) below 35 years
 (c) during first pregnancy
 (d) in mothers of at least three children
 (e) None of the above
46. Maximum net productivity in the terrestrial ecosystem is in
 (a) rainforest
 (b) deciduous forest
 (c) mangrove plantation
 (d) Both (a) and (b)
 (e) None of the above
47. Which cell of immune system cause pore formation at the surface of the plasma membrane?
 (a) Helper T-cell (b) Killer T-cell
 (c) Suppressor T-cell (d) B-cell
 (e) Both (b) and (c)
48. Dental formula of human being is
 (a) I_2, C_2, M_3 (b) I_2, C_1, P_2, M_3
 (c) I_3, C_1, P_2, M_2 (d) I_2, C_2, P_3, M_1
 (e) I_2, C_3, P_1, M_2
49. Which is incorrect?
 (a) Wings of insects and birds are analogous
 (b) Wings of insects and bats are analogous
 (c) Wings of insects and birds are homologous
 (d) Wings of bats and birds are homologous
 (e) None of the above
50. Which is not correctly matched?
 (a) Annelida — Enterocoelomate
 (b) Platyhelminthes — Acoelomate
 (c) Arthropoda — Schizocoelomate
 (d) Nematelminthes — Pseudocoelomate
 (e) None of the above
51. HIV virus affects.....in AIDS patient.
 (a) cytotoxic T-cell (b) M-N cell
 (c) suppressor cell (d) helper T-cell
 (e) None of these

52. Middle piece of sperm contains
(a) mitochondria and Golgi body
(b) axial filament and Golgi body
(c) mitochondria and axial filament
(d) centriole and Golgi body
(e) None of the above

53. Which is wrongly matched?
(a) Euglenoidae — Myonemes
(b) Ciliophora — Axonemes
(c) Annelida — Notopodia
(d) Cnidaria — Parapodia
(e) None of the above

54. The immediate cause of induction of ovulation in female is the large plasma surge of
(a) progesterone (b) oestradiol
(c) LH (d) FSH
(e) oestrogen

55. Which is not related with sexual reproduction in protozoans?
(a) Cytogamy (b) Autogamy
(c) Conjugation (d) Schizogony
(e) Both (b) and (c)

56. Identify from the following the compound that links glycolysis and Krebs' cycle
(a) Oxalo acetic acid (b) Pyruvic acid
(c) Lactic acid (d) Acetyl Co-A
(e) None of these

57. A baby has been born with a small tail. It is the case exhibiting
(a) retrogressive evolution
(b) mutation
(c) atavism
(d) metamorphosis
(e) Both (b) and (c)

58. Which is correct?
(a) Blood has WBCs and lymph has RBCs
(b) Blood has WBCs, RBCs and lymph nothing
(c) Blood has RBCs, WBCs and lymph has WBC
(d) Lymph has WBCs, RBCs and blood has RBCs
(e) None of the above

59. All protozoans have
(a) pseudopodia
(b) eukaryotic organisation
(c) contractile vacuole
(d) holozoic nutrition
(e) Both (b) and (c)

60. Phenotypic ratio of monohybrid test cross is
(a) 1 : 1 (b) 3 : 1
(c) 1 : 2 : 1 (d) 2 : 1
(e) 2 : 1 : 2

General Ability

- What is the chemical name of vinegar?
(a) Citric acid (b) Acetic acid
(c) Pyruvic acid (d) Malic acid
(e) None of these
- Which of the following is not a property of heavy water?
(a) Boiling point of heavy water is lower than that of ordinary water
(b) Density of heavy water is higher than that of ordinary water
(c) Freezing point of heavy water is higher than that of ordinary water
(d) It produces corrosion
(e) None of the above
- In which of the following processes is energy released?
(a) Respiration (b) Photosynthesis
(c) Ingestion (d) Absorption
(e) None of these
- Animals living in the tree trunks are known as
(a) arboreal (b) volant
(c) amphibious (d) aquatic
(e) None of these
- Plasma membrane in eukaryotic cells is made up of
(a) phospholipid
(b) lipoprotein
(c) phospholipoprotein
(d) phosphoprotein
(e) None of the above
- Which one of the following is also called the 'power plants' of the cell?
(a) Golgi body (b) Mitochondrion
(c) Ribosome (d) Lysosome
(e) None of these
- The modulus of rigidity is the ratio of
(a) longitudinal stress to longitudinal strain
(b) volume stress to volume strain
(c) shearing stress to shearing strain
(d) tensile stress to tensile strain
(e) None of the above
- The propagation of sound waves in a gas involves
(a) adiabatic compression and rarefaction
(b) isothermal compression and rarefaction
(c) isochoric compression and rarefaction
(d) isobaric compression and rarefaction
(e) None of the above
- An atomic clock is based on transitions in
(a) sodium (b) caesium
(c) magnesium (d) aluminium
(e) None of these
- A concave lens always forms an image which is
(a) real and erect (b) virtual and erect
(c) real and inverted (d) virtual and inverted
(e) None of these
- A vitamin requires cobalt for its activity. The vitamin is
(a) vitamin-B₁₂ (b) vitamin-D
(c) vitamin-B₂ (d) vitamin-A
(e) None of these
- One of the constituents of tear gas is
(a) ethane (b) ethanol
(c) ether (d) chloropicrin
(e) None of these
- Formalised system of trading agreements with groups of countries is known as
(a) trading blocks
(b) trade ventures
(c) trade partners
(d) trade organisations
(e) None of the above
- Mahatma Gandhi was profoundly influenced by the writings of
(a) Bernard Shaw (b) Karl Marx
(c) Lenin (d) Leo Tolstoy
(e) None of these
- Arrange the following in chronological order
1. Tughlaqs 2. Lodis
3. Saiyids 4. Ilbari Turks
5. Khiljis
(a) 1, 2, 3, 4, 5 (b) 5, 4, 3, 2, 1
(c) 2, 4, 5, 3, 1 (d) 4, 5, 1, 3, 2
(e) None of these
- The book titled 'The Indian War of Independence' was written by
(a) Krishna Verma
(b) Madame Cama
(c) B G Tilak
(d) V D Savarkar
(e) None of these
- Who was the founder of the 'Servants of India Society' ?
(a) G K Gokhale (b) M G Ranade
(c) B G Tilak (d) Bipin Chandra Pal
(e) None of these

18. The term 'Caste' was derived from
 (a) Portuguese (b) Dutch
 (c) German (d) English
 (e) None of these
19. The term 'Greater India' denotes
 (a) political unity
 (b) cultural unity
 (c) religious unity
 (d) social unity
 (e) None of the above
20. If input frequency of a full wave rectifier be n , then output frequency would be
 (a) $\frac{n}{2}$ (b) n
 (c) $\frac{3n}{2}$ (d) $2n$
 (e) None of these
21. Heat transfer horizontally within the atmosphere is called
 (a) conduction (b) convection
 (c) absorption (d) advection
 (e) None of these
22. Indian Standard Time relates to
 (a) 75.5° E longitude
 (b) 82.5° E longitude
 (c) 90.5° E longitude
 (d) 0° longitude
 (e) None of the above
23. Seismic sea waves which approach the coasts at greater force are known as
 (a) tides (b) tsunami
 (c) current (d) cyclone
 (e) None of these
24. Depressions formed due to deflating action of winds are called
 (a) Playas (b) Yardang
 (c) Ventifacts (d) Sand dunes
 (e) None of these
25. The land of maximum biodiversity is
 (a) tropical (b) temperate
 (c) monsoonal (d) equatorial
 (e) None of these
26. The Messenger Satellite launched by NASA is to study
 (a) Mercury
 (b) Venus
 (c) Saturn
 (d) Jupiter
 (e) None of the above
27. What was the name of the ship that sank near the Paradeep Port in September, 2009 causing an oil spill?
 (a) Red Rose
 (b) Black Rose
 (c) White Rose
 (d) Green Rose
 (e) None of the above
28. Who among the following has been honoured with the prestigious Dadasaheb Phalke Award for 2007?
 (a) Yash Chopra
 (b) Ustad Amjad Ali Khan
 (c) Manna Dey
 (d) A Nageshwara Rao
 (e) None of these
29. The forest in Sunderban is called
 (a) scrub jungle (b) mangrove
 (c) deciduous forest (d) tundra
 (e) None of these
30. Noise is measured in
 (a) watt (b) REM
 (c) centigrade (d) decibel
 (e) None of these
31. Who among the following captured his third consecutive National Billiards title in the year 2009?
 (a) Pankaj Advani
 (b) Devendra Joshi
 (c) Geet Sethi
 (d) Dhruv Sitawala
 (e) None of the above
32. The two forms of democracy are
 (a) parliamentary and presidential
 (b) direct and indirect
 (c) monarchical and republican
 (d) parliamentary and king
 (e) None of the above
33. Which is an extra-Constitutional body?
 (a) Language Commission
 (b) Planning Commission
 (c) Election Commission
 (d) Finance Commission
 (e) None of the above
34. The Prime Minister of India is
 (a) elected
 (b) appointed
 (c) nominated
 (d) selected
 (e) None of the above

35. Which is not an All India Service ?
 (a) Indian Administrative Service
 (b) Indian Police Service
 (c) Indian Foreign Service
 (d) Indian Forest Service
 (e) None of these
36. Who is rightly called the 'Father of Local Self Government' in India ?
 (a) Lord Mayo (b) Lord Ripon
 (c) Lord Curzon (d) Lord Clive
 (e) None of these
37. The Directive Principles of State Policy was adopted from the
 (a) British Constitution (b) Swiss Constitution
 (c) U S Constitution (d) Irish Constitution
 (e) None of the above
38. Which is the second nearest star to the Earth after the Sun ?
 (a) Vega (b) Sirius
 (c) Proxima Centauri (d) Alpha Centauri
 (e) None of these
39. Which one of the following is not a method of estimating National Income ?
 (a) Expenditure method
 (b) Product method
 (c) Matrix method
 (d) Income method
 (e) None of the above
40. The monetary policy in India is formulated by
 (a) Central Government
 (b) Industrial Financial Corporation of India
 (c) Reserve Bank of India
 (d) Industrial Development Bank of India
 (e) None of the above
41. A short-term government security paper is called
 (a) share (b) debenture
 (c) mutual fund (d) treasury bill
 (e) None of these
42. WTO basically promotes
 (a) financial support (b) global peace
 (c) unilateral trade (d) multilateral trade
 (e) None of these
43. Under which market condition do firms have excess capacity ?
 (a) Perfect competition
 (b) Monopolistic competition
 (c) Duopoly
 (d) Oligopoly
 (e) None of the above
44. Price theory is also known as
 (a) Macro Economics
 (b) Development Economics
 (c) Public Economics
 (d) Micro Economics
 (e) None of these
45. An intelligent terminal
 (a) Has a microprocessor, but cannot be programmed by the user
 (b) can process small data processing jobs, with the use of a large CPU
 (c) interacts with the user in English
 (d) cannot take data from the user
 (e) None of the above
46. Who among the following won the 'ICC Cricketer of the Year Award' for the year 2009 ?
 (a) M S Dhoni
 (b) Gautam Gambhir
 (c) Mitchell Johnson
 (d) Tilakaratne Dilshan
 (e) None of the above
47. The bats can fly in the dark because
 (a) they can see the objects in darkness
 (b) they have weak legs and are likely to be attacked by predators
 (c) they generate flashes of light
 (d) they generate ultrasonic sound waves
 (e) None of the above
48. What changes will happen to a bowl of ice and water kept at exactly zero degree celsius ?
 (a) All ice will melt
 (b) All water will become ice
 (c) No change will happen
 (d) Only some ice will melt
 (e) None of the above
49. National Income is the
 (a) Net National Product at market price
 (b) Net National Product at factor cost
 (c) Net Domestic Product at market price
 (d) Net Domestic Product at factor cost
 (e) None of the above
50. At present, India is following
 (a) fixed exchange rate
 (b) floating exchange rate
 (c) pegged up exchange rate
 (d) pegged down exchange rate
 (e) None of the above

51. The exchange of commodities between two countries is referred as
 (a) balance of trade (b) bilateral trade
 (c) volume of trade (d) multilateral trade
 (e) None of these
52. Soil erosion on hill slopes can be checked by
 (a) afforestation (b) terrace cultivation
 (c) strip cropping (d) contour ploughing
 (e) None of these
53. Who coined the word 'Geography' ?
 (a) Ptolemy (b) Eratosthenese
 (c) Hecataus (d) Herodatus
 (e) None of these
54. Which of the following is called the "ecological hot spot of India" ?
 (a) Western Ghats
 (b) Eastern Ghats
 (c) Western Himalayas
 (d) Eastern Himalayas
 (e) None of these
55. The art and science of map making is called
 (a) remote sensing
 (b) cartography
 (c) photogrammetry
 (d) mapping
 (e) None of these
56. The age of the Earth can be determined by
 (a) geological time scale
 (b) radio-metric dating
 (c) gravity method
 (d) fossilization method
 (e) None of the above
57. The monk who influenced Ashoka to embrace Buddhism was
 (a) Vishnu Gupta (b) Upa Gupta
 (c) Brahma Gupta (d) Brihadratha
 (e) None of these
58. The declaration that Democracy is a Government 'of the people, by the people; for the people' was made by
 (a) George Washington
 (b) Winston Churchill
 (c) Abraham Lincoln
 (d) Theodore Roosevelt
 (e) None of the above
59. The Lodi dynasty was founded by
 (a) Ibrahim Lodi (b) Sikandar Lodi
 (c) Bahlol Lodi (d) Khizr Khan
 (e) None of these
60. Harshavardhana was defeated by
 (a) Prabhakaravardhana
 (b) Pulakesin II
 (c) Narasimhavarma Pallava
 (d) Sasanka
 (e) None of these
61. Who among the following was an illiterate ?
 (a) Jahangir (b) Shah Jahan
 (c) Akbar (d) Aurangzeb
 (e) None of these
62. Which Governor General is associated with Doctrine of Lapse ?
 (a) Lord Ripon (b) Lord Dalhousie
 (c) Lord Bentinck (d) Lord Curzon
 (e) None of the above
63. India attained 'Dominion Status' on
 (a) 15th January, 1947
 (b) 15th August, 1947
 (c) 15th August, 1950
 (d) 15th October, 1947
 (e) None of the above
64. Despotism is possible in a
 (a) one party state
 (b) two party state
 (c) multi party state
 (d) two and multi party state
 (e) None of the above
65. Marx belonged to
 (a) Germany (b) Holland
 (c) France (d) Britain
 (e) None of these
66. Which one of the following is the guardian of Fundamental Rights ?
 (a) Legislature (b) Executive
 (c) Political parties (d) Judiciary
 (e) None of these
67. Sarkaria Commission was concerned with
 (a) administrative reforms
 (b) electoral reforms
 (c) financial reforms
 (d) centre-state relations
 (e) None of the above
68. The Speaker of the Lok-Sabha has to address his/her letter of resignation to
 (a) Prime Minister of India
 (b) President of India
 (c) Deputy Speaker of Lok Sabha
 (d) Minister of Parliamentary Affairs
 (e) None of the above

69. A want becomes a demand only when it is backed by the
- ability to purchase
 - necessity to buy
 - desire to buy
 - utility of the product
 - None of the above
70. The terms "Micro Economics" and "Macro Economics" were coined by
- Alfred Marshall
 - Ragner Nurkse
 - Ragner Frisch
 - J M Keynes
 - None of the above
71. During periods of inflation, tax rates should
- increase
 - decrease
 - remain constant
 - fluctuate
 - None of the above
72. Which is the biggest tax paying sector in India ?
- Agriculture sector
 - Industrial sector
 - Transport sector
 - Banking sector
 - None of the above
73. "Economics is what it ought to be"—This statement refers to
- normative economics
 - positive economics
 - monetary economics
 - fiscal economics
 - None of the above
74. The excess of price a person is to pay rather than forego the consumption of the commodity is called
- price
 - profit
 - producers' surplus
 - consumers' surplus
 - None of the above
75. Silver halides are used in photographic plates because they are
- oxidised in air
 - soluble in hyposolution
 - reduced by light
 - totally colourless
 - None of the above
76. Tetra Ethyl Lead (TEL) is
- a catalyst in burning fossil fuel
 - an antioxidant
 - a reductant
 - an antiknock compound
 - None of the above
77. Curie point is the temperature at which
- matter becomes radioactive
 - a metal loses magnetic properties
 - a metal loses conductivity
 - transmutation of metal occurs
 - None of the above
78. The isotope used for the production of atomic energy is
- | | |
|-------------------|-----------|
| (a) U-235 | (b) U-238 |
| (c) U-234 | (d) U-236 |
| (e) None of these | |
79. The acceleration due to gravity at the equator
- is less than that at the poles
 - is greater than that at the poles
 - is equal to that at the poles
 - does not depend on the Earth's centripetal acceleration
 - None of the above
80. Which of the following is not a nucleon ?
- | | |
|-----------------------|--------------|
| (a) Proton | (b) Neutron |
| (c) Electron | (d) Positron |
| (e) None of the above | |
81. The material used in the manufacture of lead pencil is
- | | |
|-------------------|----------|
| (a) graphite | (b) lead |
| (c) carbon | (d) mica |
| (e) None of these | |
82. Angle of friction and angle of repose are
- equal to each other
 - not equal to each other
 - proportional to each other
 - Both (b) and (c)
 - None of the above
83. Processor's speed of a computer is measured in
- | | |
|-------------------|-----------|
| (a) BPS | (b) MIPS |
| (c) Baud | (d) Hertz |
| (e) None of these | |
84. 'C' language is a
- low level language
 - high level language
 - machine level language
 - assembly level language
 - None of the above

85. What happens to a person who receives the wrong type of blood ?
 (a) All the arteries constrict
 (b) All the arteries dilates
 (c) The RBCs agglutinate
 (d) The spleen and lymphnodes deteriorate
 (e) None of the above
86. NIS stands for
 (a) National Infectious diseases Seminar
 (b) National Irrigation Schedule
 (c) National Immunisation Schedule
 (d) National Information Sector
 (e) None of the above
87. If all bullets could not removed from gun shot injury of a man, it may cause poisoning by
 (a) mercury (b) lead
 (c) iron (d) arsenic
 (e) None of these
88. Ringworm is a disease.
 (a) bacterial (b) protozoan
 (c) viral (d) fungal
 (e) None of these
89. Pituitary gland is situated in
 (a) the base of the heart
 (b) the base of the brain
 (c) the neck
 (d) the abdomen
 (e) None of the above
90. Who discovered cement ?
 (a) Agassit (b) Albertus magnus
 (c) Joseph aspdin (d) Janseen
 (e) None of these
91. According to RBI's report on the trend and progress of banking, the Non-Performing Assets (NPA's) in India for 2008-09 for Indian Banks in 2008 have stood at
 (a) 2.3 per cent (b) 2.6 per cent
 (c) 3.5 per cent (d) 5.2 per cent
 (e) None of these
92. Windows 7, the latest operating system from Microsoft Corporation has Indian languages fonts
 (a) 14 (b) 26
 (c) 37 (d) 49
 (e) None of these
93. TRIPS and TRIMS are the terms associated with
 (a) IMF (b) WTO
 (c) IBRD (d) IDA
 (e) None of these
94. A Presidential Ordinance can remain in force
 (a) for three months
 (b) for six months
 (c) for nine months
 (d) indefinitely
 (e) None of these
95. Which of the following Indonesian regions was a victim of massive earthquake in 2004 ?
 (a) Irian Jaya (b) Sumatra
 (c) Kalibangan (d) Java
 (e) None of these
96. The first non-stop air-conditioned 'DURANTO' train was flagged off between
 (a) Sealdah - New Delhi
 (b) Mumbai - Howrah
 (c) Bangalore - Howrah
 (d) Chennai - New Delhi
 (e) None of the above
97. Which among the following agencies released the report, Economic Outlook for 2009-10 ?
 (a) Planning Commission
 (b) PM's Economic Advisory Council
 (c) Finance Commission
 (d) Reserve Bank of India
 (e) None of the above
98. India and US have decided to finalize agreements related to which of the following ?
 (a) Trade and Investment
 (b) Intellectual Property
 (c) Traditional Knowledge
 (d) All of the above
 (e) None of the above
99. Which one of the following states does not form part of Narmada river basin ?
 (a) Madhya Pradesh
 (b) Rajasthan
 (c) Gujarat
 (d) Maharashtra
 (e) None of the above
100. Which of the following countries has recently become the third largest market for Twitter ?
 (a) China (b) India
 (c) Brazil (d) Indonesia
 (e) None of these
101. Which Indian State has the largest coastline ?
 (a) Andhra Pradesh
 (b) Maharashtra
 (c) Orissa
 (d) Tamil Nadu
 (e) None of the above

102. RAF stands for
 (a) Ready Action Force
 (b) Rapid Action Force
 (c) Reverse Action Force
 (d) Repeat Action Force
 (e) None of the above
103. Bolometer is used to measure
 (a) Frequency
 (b) Temperature
 (c) Velocity
 (d) Wavelength
 (e) None of these
104. Tehri Dam is being constructed on river
 (a) Ganga
 (b) Brahmaputra
 (c) Bhagirathi
 (d) Yamuna
 (e) None of these
105. Which of the following is incorrect?
 (a) AIDS is a retroviral disease
 (b) AIDS is transmitted by homo and hetero-sexual contact
 (c) AIDS was first recognized in USA in 1981
 (d) AIDS causes ano-genital warts
 (e) None of the above
106. The new international Multi-dimensional Poverty Index (MPI) has been developed by :
 (1) Cambridge Poverty and Human Development Initiative
 (2) Columbia Poverty and Human Development Initiative
 (3) Massachusetts Poverty and Human Development Initiative
 (4) Oxford Poverty and Human Development Initiative
 (e) None of the above
107. With which Western country has India signed a Counter Terrorism Initiative that includes steps to check financing of terror activities, joint probe in cases of bomb blasts besides cooperation in cyber and border security?
 (a) France
 (b) UK
 (c) US
 (d) Germany
 (e) None of these
108. The new Terminal-3 of the Indira Gandhi International Airport was recently inaugurated by Prime Minister Manmohan Singh in New Delhi on July 3. Which company leads the group of companies that constructed the terminal?
 (a) Reliance Infra
 (b) L&T
 (c) Jaypee Group
 (d) GMR group
 (e) None of the above
109. Which of these has become the first country in Latin America to legalize same-sex marriage?
 (a) Bolivia
 (b) Venezuela
 (c) Colombia
 (d) Argentina
 (e) None of these
110. The Finance Ministers of European Union have recently given their final approval for Estonia to adopt the euro as its currency on 1 Jan, 2011. The tiny Baltic state will become the _____ member of the single currency.
 (a) 16th
 (b) 15th
 (c) 18th
 (d) 19th
 (e) 17th
111. Which of the following companies has started Street View Project, a technology that provides panoramic views from various positions along many streets in the world?
 (a) IBM
 (b) Google
 (c) Infosys
 (d) Microsoft
 (e) None of the above
112. India has recently adopted a new symbol to denote its currency Rupee. Who among the following has developed the new Rupee Symbol?
 (a) D Ramesh Kumar
 (b) P Umesh Kumar
 (c) D Mukesh Kumar
 (d) S.K. Mittal
 (e) D Udaya Kumar
113. Researchers have been successful in creating genetically altered mosquitoes that cannot infect humans with malaria, which claims over one million lives worldwide every year. Which species of mosquito was used by the scientists in their research?
 (a) Anopheles albimanus
 (b) Anopheles stephensi
 (c) Anopheles benarrochi
 (d) Anopheles apicimacula
 (e) None of the above
114. The prestigious Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP), a UNESCO institute, will be unveiled on his birth anniversary on Oct 2 in which of these cities?
 (a) Johannesburg
 (b) New Delhi
 (c) Djakarta
 (d) Geneva
 (e) None of the above

115. With which African country has India sign an MoU to conduct a feasibility study for setting up a urea plant with an annual capacity of at least one million tonnes in the African nation?

- (a) Nigeria
- (b) Ghana
- (c) Kenya
- (d) Egypt
- (e) None of these

116. Which of these statements is/are correct regarding the five pacts signed between India and Myanmar after PM Manmohan Singh held talks with visiting Myanmar's military ruler, General Than Shwe?

- I. The two countries signed a treaty on mutual legal assistance in criminal matters that will be crucial in enabling India get access to insurgents from India's northeast states who continue to shelter along the India-Myanmar border.
- II. An MoU on Indian assistance in restoring the Ananda temple in Bagan, a renowned Buddhist shrine in central Myanmar, was also inked.

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II
- (e) Statements are not clear

117. The first international cricket match was played between which two countries?

- (a) United States and Canada
- (b) England and Canada
- (c) New Zealand and Rhodesia
- (d) India and Australia

118. Rank outsider Louis Oosthuizen won the British Open, capturing golf's biggest prize recently. Louis Oosthuizen belongs to which country?

- (a) Argentina
- (b) Australia
- (c) Belgium
- (d) Venezuela
- (e) South Africa

119. Which Indian Olympian notched up the biggest title of his career when he clinched the US Open Table Tennis Championships crown?

- (a) Kamlesh Mehta
- (b) Poulomi Ghatak
- (c) Venugopal Chandrasekhar
- (d) Achanta Sharath Kamal
- (e) None of the above

120. Which of these statements is/are correct?

I. India has become a full-fledged member of Financial Action Task Force (FATF), an inter-governmental body, responsible for setting global standards on anti-money laundering and combating the financing of terrorism.

II. FATF membership is very important for India in its quest to become a major player in the International finance.

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II
- (e) Statements are not clear