

Maharashtra Combined Entrance (MHT-CET) Test - 2015

Physics

- In the expression for Boyle's law, the product pV has dimensions of
 - force
 - impulse
 - energy
 - momentum
- The difference between angular speed of minute hand and second hand of a clock is
 - $\frac{59\pi}{900}$ rad/s
 - $\frac{59\pi}{1800}$ rad/s
 - $\frac{59\pi}{2400}$ rad/s
 - $\frac{59\pi}{3600}$ rad/s
- A metal rod of length L , cross-sectional area A , Young's modulus Y and coefficient of linear expansion α is heated to $t^\circ\text{C}$. The work that can be performed by the rod when heated is
 - $\frac{YA\alpha Lt^2}{2}$
 - $\frac{YA\alpha^2 Lt^2}{2}$
 - $\frac{YA\alpha^2 L^2 t^2}{2}$
 - $\frac{YA\alpha Lt}{2}$
- In a sonometer experiment, the bridges are separated by a fixed distance. The wire which is slightly elastic, emits a tone of frequency n when held by tension T . If the tension is increased to $4T$, the tone emitted by the wire will be of frequency
 - n
 - $2n$
 - slightly greater than $2n$
 - slightly less than $2n$
- A particle performs SHM with amplitude 25 cm and period 3 s. The minimum time required for it to move between two points 12.5 cm on either side of the mean position is
 - 0.6 s
 - 0.5 s
 - 0.4 s
 - 0.2 s
- The pitch of the whistle of an engine appears to drop to $\left(\frac{5}{6}\right)$ th of original value when it passes a stationary observer. If the speed of sound in air is 350 m/s, then the speed of engine is
 - 35 m/s
 - 70 m/s
 - 105 m/s
 - 140 m/s
- A solid cylinder has mass M , radius R and length l . Its moment of inertia about an axis passing through its centre and perpendicular to its own axis is
 - $\frac{2MR^2}{3} + \frac{Ml^2}{12}$
 - $\frac{MR^2}{3} + \frac{Ml^2}{12}$
 - $\frac{3MR^2}{4} + \frac{Ml^2}{12}$
 - $\frac{MR^2}{4} + \frac{Ml^2}{12}$
- A particle is executing SHM of periodic time T . The time taken by a particle in moving from mean position to half the maximum displacement is ($\sin 30^\circ = 0.5$)
 - $\frac{T}{2}$
 - $\frac{T}{4}$
 - $\frac{T}{8}$
 - $\frac{T}{12}$

9. The dimensions of Stefan's constant are
 a. $[M^0LT^{-3}K^{-4}]$
 b. $[MLT^{-3}K^{-3}]$
 c. $[ML^2T^{-3}K^{-4}]$
 d. $[ML^0T^{-3}K^{-4}]$
10. An open and closed organ pipe have the same length. The ratio of p th mode of frequency of vibration of air in two pipes is
 a. $p(2p+1)$
 b. $\frac{2p}{2p-1}$
 c. p
 d. 1
11. A cord is wound around the circumference of wheel of radius r . The axis of the wheel is horizontal and moment of inertia about it is I . The weight mg is attached to the end of the cord and falls from rest. After falling through a distance h , the angular velocity of the wheel will be
 a. $[mgh]^{1/2}$
 b. $\left[\frac{2mgh}{I+2mr^2}\right]^{1/2}$
 c. $\left[\frac{2mgh}{I+mr^2}\right]^{1/2}$
 d. $\left[\frac{mgh}{I+mr^2}\right]^{1/2}$
12. A toy cart is tied to the end of an unstretched string of length l . When revolved, the toy cart moves in horizontal circle with radius $2l$ and time period T . If it is speeded until it moves in horizontal circle of radius $3l$ with period T_1 , relation between T and T_1 is (Hooke's law is obeyed)
 a. $T_1 = \frac{2}{\sqrt{3}}T$
 b. $T_1 = \sqrt{\frac{3}{2}}T$
 c. $T_1 = \sqrt{\frac{2}{3}}T$
 d. $T_1 = \frac{\sqrt{3}}{2}T$
13. In a pipe opened at both ends, n_1 and n_2 be the frequencies corresponding to vibrating lengths l_1 and l_2 , respectively. The end correction is
 a. $\frac{n_1l_1 - n_2l_2}{2(n_1 - n_2)}$
 b. $\frac{n_2l_2 - n_1l_1}{2(n_2 - n_1)}$
 c. $\frac{n_2l_2 - n_1l_1}{2(n_1 - n_2)}$
 d. $\frac{n_2l_2 - n_1l_1}{(n_1 - n_2)}$
14. A mass is suspended from a spring having spring constant k is displaced vertically and released, it oscillates with period T . The weight of the mass suspended is (g = gravitational acceleration)
 a. $\frac{kTg}{4\pi^2}$
 b. $\frac{kT^2g}{4\pi^2}$
 c. $\frac{kTg}{2\pi^2}$
 d. $\frac{kT^2g}{2\pi^2}$
15. A satellite of mass m is revolving in circular orbit of radius r around the earth. Its angular momentum w.r.t. the centre of its orbit is (M = mass of earth, G = universal gravitational constant)
 a. $(GMmr)^{1/2}$
 b. $(GMm^2r)^{1/2}$
 c. $(GMm^2r^2)^{1/2}$
 d. $(GM^2m^2r)^{1/2}$
16. A liquid rises to a height of 1.8 cm in a glass capillary A . Another glass capillary B having diameter 90% of capillary A is immersed in the same liquid. The rise of liquid in capillary B is
 a. 1.4 cm
 b. 1.8 cm
 c. 2.0 cm
 d. 2.2 cm
17. A particle of mass m is moving in a circular path of constant radius r such that centripetal acceleration is varying with time t as k^2rt^2 , where k is a constant. The power delivered to the particle by the force acting on it is
 a. $m^2k^2r^2t^2$
 b. mk^2r^2t
 c. mk^2rt^2
 d. $mkrt^2$
18. A simple pendulum is oscillating with amplitude A and angular frequency ω . At displacement x from mean position, the ratio of kinetic energy to potential energy is
 a. $\frac{x^2}{A^2 - x^2}$
 b. $\frac{x^2 - A^2}{x^2}$
 c. $\frac{A^2 - x^2}{x^2}$
 d. $\frac{A - x}{x}$

19. The equation of the progressive wave is $y = a \sin 2\pi \left(nt - \frac{x}{5} \right)$. The ratio of maximum particle velocity to wave velocity is
- a. $\frac{\pi a}{5}$ b. $\frac{2\pi a}{5}$
 c. $\frac{3\pi a}{5}$ d. $\frac{4\pi a}{5}$
20. Let, g_h and g_d be the acceleration due to gravity at height h above the earth's surface and at depth d below the earth's surface respectively. If $g_h = g_d$, then the relation between h and d is
- a. $d = h$ b. $d = \frac{h}{2}$
 c. $d = \frac{h}{4}$ d. $d = 2h$
21. A rope of 1cm in diameter breaks if tension in it exceeds 500 N. The maximum tension that may be given to a similar rope of diameter 2 cm is
- a. 2000 N b. 1000 N
 c. 500 N d. 250 N
22. The length and diameter of a metal wire is doubled. The fundamental frequency of vibration will change from n to (tension being kept constant and material of both the wires is same)
- a. $\frac{n}{4}$ b. $\frac{n}{8}$
 c. $\frac{n}{12}$ d. $\frac{n}{16}$
23. A hollow sphere of mass M and radius R is rotating with angular frequency ω . It suddenly stops rotating and 75% of kinetic energy is converted to heat. If s is the specific heat of the material in J/kg-K, then rise in temperature of the sphere is (MI of hollow sphere = $\frac{2}{3} MR^2$)
- a. $\frac{R\omega}{4s}$ b. $\frac{R^2\omega^2}{4s}$
 c. $\frac{R\omega}{2s}$ d. $\frac{R^2\omega^2}{2s}$
24. A large number of liquid drops each of radius a are merged to form a single spherical drop of radius b . The energy released in the process is converted into kinetic energy of the big drop formed. The speed of the big drop is
 [ρ = density of liquid, T = surface tension of liquid]
- a. $\left[\frac{6T}{\rho} \left(\frac{1}{a} - \frac{1}{b} \right) \right]^{1/2}$ b. $\left[\frac{6T}{\rho} \left(\frac{1}{b} - \frac{1}{a} \right) \right]^{1/2}$
 c. $\left[\frac{\rho}{6T} \left(\frac{1}{a} - \frac{1}{b} \right) \right]^{1/2}$ d. $\left[\frac{\rho}{6T} \left(\frac{1}{b} - \frac{1}{a} \right) \right]^{1/2}$
25. A black body radiates heat at temperatures T_1 and T_2 ($T_2 > T_1$). The frequency corresponding to maximum energy is
- a. more at T_1
 b. more at T_2
 c. equal for T_1 and T_2
 d. independent of T_1 and T_2
26. For diamagnetic materials, magnetic susceptibility is
- a. small and negative b. small and positive
 c. large and negative d. large and positive
27. For Balmer series, wavelength of first line is λ_1 and for Brackett series, wavelength of first line is λ_2 , then $\frac{\lambda_1}{\lambda_2}$ is
- a. 0.081 b. 0.162 c. 0.198 d. 0.238
28. The distances of a point on the screen from two slits in biprism experiment is 1.8×10^{-5} m and 1.23×10^{-5} m. If wavelength of light used is 6000 Å, then fringe formed at that point is
- a. 10th bright b. 10th dark
 c. 9th bright d. 9th dark
29. Same current is flowing in two AC circuits. First contains only inductance and second contains only capacitance. If frequency of AC is increased for both, the current will
- a. increase in first circuit and decrease in second
 b. increase in both circuits
 c. decrease in both circuits
 d. decrease in first circuit and increase in second

30. The difference in the effective capacity of two similar capacitors when joined in series and then in parallel is $6 \mu\text{F}$. The capacity of each capacitor is
 a. $2 \mu\text{F}$ b. $4 \mu\text{F}$ c. $8 \mu\text{F}$ d. $16 \mu\text{F}$
31. Which logic gate produces LOW output when any of the inputs is HIGH?
 a. AND b. OR c. NAND d. NOR
32. An electron of mass m and charge q is accelerated from rest in a uniform electric field of strength E . The velocity acquired by it as it travels a distance l is
 a. $\left[\frac{2Eq}{m}\right]^{1/2}$ b. $\left[\frac{2Eq}{ml}\right]^{1/2}$
 c. $\left[\frac{2Em}{ql}\right]^{1/2}$ d. $\left[\frac{Eq}{ml}\right]^{1/2}$
33. A light is travelling from air into a medium. The velocity of light in a medium is reduced to 0.75 times the velocity in air. Assume that angle of incidence i is very small, the deviation of the ray is
 a. i b. $\frac{i}{3}$ c. $\frac{i}{4}$ d. $\frac{3i}{4}$
34. The electric field intensity at a point near and outside the surface of a charged conductor of any shape is E_1 . The electric field intensity due to uniformly charged infinite thin plane sheet is E_2 . The relation between E_1 and E_2 is
 a. $2E_1 = E_2$ b. $E_1 = E_2$
 c. $E_1 = 2E_2$ d. $E_1 = 4E_2$
35. Sensitivity of a moving coil galvanometer can be increased by
 a. decreasing the number of turns of coil
 b. increasing the number of turns of coil
 c. decreasing the area of a coil
 d. by using a weak magnet
36. For the hydrogen atom, the energy of radiation emitted in the transition from 4th excited state to 2nd excited state, according to Bohr's theory is
 a. 0.567 eV b. 0.667 eV
 c. 0.967 eV d. 1.267 eV
37. Two coherent monochromatic light beams of intensities $4I$ and $9I$ are superimposed. The maximum and minimum possible intensities in the resulting beam are
 a. $3I$ and $2I$ b. $9I$ and $5I$
 c. $16I$ and $3I$ d. $25I$ and I
38. The resistances in left and right gap of a meter bridge are 20Ω and 30Ω , respectively. When the resistance in the left gap is reduced to half its value, then balance point shifts by
 a. 15 cm to the right b. 15 cm to the left
 c. 20 cm to the right d. 20 cm to the left
39. For the same angle of incidence, the angles of refraction in media P, Q, R and S are $50^\circ, 40^\circ, 30^\circ, 20^\circ$, respectively. The speed of light is minimum in medium
 a. P b. Q c. R d. S
40. The process of regaining of information from carrier wave at the receiver is termed as
 a. demodulation b. modulation
 c. attenuation d. amplification
41. A potentiometer wire of length 10 m is connected in series with a battery. The emf of a cell balances against 250 cm length of wire. If length of potentiometer wire is increased by 1 m , then new balancing length of wire will be
 a. 2.00 m b. 2.25 m c. 2.50 m d. 2.75 m
42. Two coils A and B have mutual inductance $2 \times 10^{-2} \text{ henry}$. If the current in the primary is $i = 5 \sin 10\pi t$, then the maximum value of emf induced in coil B is
 a. $\pi \text{ volt}$ b. $\frac{\pi}{2} \text{ volt}$ c. $\frac{\pi}{3} \text{ volt}$ d. $\frac{\pi}{4} \text{ volt}$
43. For a transistor, the current ratio α_{DC} is $\frac{69}{70}$. The current gain β_{DC} is
 a. 66 b. 67
 c. 69 d. 71

44. In Young's double slit experiment, the ratio of intensities of bright and dark bands is 16 which means
 a. the ratio of their amplitudes is 5
 b. intensities of individual sources are 25 and 9 units respectively
 c. the ratio of their amplitudes is 4
 d. intensities of individual sources are 4 and 3 units respectively
45. A range of galvanometer is V , when 50Ω resistance is connected in series. Its range gets doubled when 500Ω resistance is connected in series. Galvanometer resistance is
 a. 100Ω b. 200Ω c. 300Ω d. 400Ω
46. The capacity of a parallel plate air capacitor is $2 \mu\text{F}$ and voltage between the plates is changing at the rate of 3 V/s . The displacement current in the capacitor is
 a. $2 \mu\text{A}$ b. $3 \mu\text{A}$ c. $5 \mu\text{A}$ d. $6 \mu\text{A}$
47. A capacitor $C_1 = 4 \mu\text{F}$ is connected in series with another capacitor $C_2 = 1 \mu\text{F}$. The combination is connected across DC source of 200 V . The ratio of potential across C_2 to C_1 is
 a. 2 : 1 b. 4 : 1 c. 8 : 1 d. 16 : 1
48. When monochromatic light of wavelength λ is incident on a metallic surface, the stopping potential for photoelectric current is $3V_0$. When same surface is illuminated with light of wavelength 2λ , the stopping potential is V_0 .
 The threshold wavelength for this surface when photoelectric effect takes place is
 a. λ b. 2λ
 c. 3λ d. 4λ
49. A coil carrying current I has radius r and number of turns n . It is rewound so that radius of new coil is $\frac{r}{4}$ and it carries current I .
 The ratio of magnetic moment of new coil to that of original coil is
 a. 1 b. $\frac{1}{2}$ c. $\frac{1}{4}$ d. $\frac{1}{8}$
50. The de-Broglie wavelength λ of a particle
 a. is proportional to mass
 b. is proportional to impulse
 c. is inversely proportional to impulse
 d. does not depend on impulse

Chemistry

1. Which of the following is the most stable diazonium salt?
 a. $\text{C}_6\text{H}_5\text{CH}_2\text{N}_2^+\text{X}^-$ b. $\text{CH}_3\text{N}_2^+\text{X}^-$
 c. $\text{CH}_3\text{CH}_2\text{N}_2^+\text{X}^-$ d. $\text{C}_6\text{H}_5\text{N}_2^+\text{X}^-$
2. Electronic configuration of only one p -block element is exceptional. One molecule of that element consists of how many atoms of it?
 a. One b. Two
 c. Three d. Four
3. The correct IUPAC name of $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$ is
 a. Triammine trinitro-N cobalt (III)
 b. Triammine trinitro-N cobalt (II)
 c. Triammine cobalt (III) nitrite
 d. Triammine trinitro-N cobaltate (III)
4. If M , W and V represent molar mass of solute, then mass of solute and volume of solution in litres respectively, which among following equations is true?
 a. $\pi = \frac{MWR}{TV}$
 b. $\pi = \frac{TMR}{WV}$
 c. $\pi = \frac{TWR}{VM}$
 d. $\pi = \frac{TRV}{WM}$
5. The replacement of diazonium group by fluorine is known as
 a. Gattermann reaction
 b. Sandmeyer reaction
 c. Balz-Schiemann reaction
 d. Etard reaction

6. For which among the following reactions, change in entropy is less than zero?
- Sublimation of iodine
 - Dissociation of hydrogen
 - Formation of water
 - Thermal decomposition of calcium carbonate
7. $[\text{Cr}(\text{NH}_3)_6][\text{Cr}(\text{SCN})_6]$ and $[\text{Cr}(\text{NH}_3)_2(\text{SCN})_4][\text{Cr}(\text{NH}_3)_4(\text{SCN})_2]$ are the examples of what type of isomerism?
- Ionisation isomerism
 - Linkage isomerism
 - Coordination isomerism
 - Solvate isomerism
8. For the reaction $\text{O}_3(g) + \text{O}(g) \longrightarrow 2\text{O}_2(g)$, if the rate law expression is, rate = $k[\text{O}_3][\text{O}]$, the molecularity and order of the reaction respectively are
- 2 and 2
 - 2 and 1.33
 - 2 and 1
 - 1 and 2
9. $R-\text{C}\equiv\text{N} + 2\text{H} \xrightarrow[\text{(ii) H}_3\text{O}^+]{\text{(i) SnCl}_2/\text{dil. HCl}} \text{RCHO} + \text{NH}_4\text{Cl}$, this reaction is known as
- Etard reaction
 - Stephen reaction
 - Hell-Volhard-Zelinsky reaction
 - Balz-Schiemann reaction
10. Select a ferromagnetic material from the following.
- Dioxygen
 - Chromium (IV) oxide
 - Benzene
 - Dihydrogen monoxide
11. What is the volume of water consumed during acid hydrolysis of 1.368 kg of sucrose? (Given : molar masses of sucrose = 342, water = 18, density of water = 1g/cm^3)
- 0.072 dm^3
 - 0.720 dm^3
 - 0.18 dm^3
 - 0.018 dm^3
12. The process in which metal surface is made inactive is called
- passivation
 - galvanising
 - corrosion
 - pickling
13. Which among the following group 15 element forms most stable pentavalent compound?
- Phosphorus
 - Antimony
 - Bismuth
 - Arsenic
14. Which among the following functional groups has been given the highest priority while assigning *R-S* configuration?
- $-\text{C}_6\text{H}_5$
 - $-\text{CN}$
 - $-\text{C}_2\text{H}_5$
 - $-\text{CH}_3$
15. Given: $R = 8.314\text{ JK}^{-1}\text{ mol}^{-1}$, the work done during combustion of 0.090 kg of ethane (molar mass = 30) at 300 K is
- -18.7 kJ
 - 18.7 kJ
 - 6.234 kJ
 - -6.234 kJ
16. Potassium dichromate is a good oxidising agent in acidic medium, the oxidation state of chromium changes by
- 2
 - 3
 - 4
 - 5
17. Diethyl amine when treated with nitrous acid yields
- diethyl ammonium nitrite
 - ethyl alcohol
 - N-nitroso diethyl amine
 - triethyl ammonium nitrite
18. What is the most abundant element on earth?
- Hydrogen
 - Nitrogen
 - Oxygen
 - Silicon
19. The overall reaction taking place at anode during electrolysis of fused sodium chloride using suitable electrode is
- oxidation of chloride
 - reduction of sodium ions
 - reduction of chlorine
 - oxidation of sodium atoms
20. The only radioactive element among the lanthanoids is
- gadolinium
 - holmium
 - promethium
 - neodymium
21. Identify a metalloid from the following list of elements.
- Carbon
 - Neon
 - Sodium
 - Tellurium

22. What is the chemical composition of Nicol prism?
 a. Al_2O_3 b. CaSO_4 c. CaCO_3 d. Na_3AlF_6
23. Identify the heteropolymer from the list given below.
 a. Polythene b. Nylon-6
 c. Teflon d. Nylon-6 6
24. What is the basicity of orthophosphorous acid?
 a. One b. Two c. Three d. Four
25. The correct order of reactivity of aldehydes and ketones towards hydrogen cyanide is
 a. $\text{CH}_3\text{COCH}_3 > \text{CH}_3\text{CHO} > \text{HCHO}$
 b. $\text{CH}_3\text{COCH}_3 > \text{HCHO} > \text{CH}_3\text{CHO}$
 c. $\text{CH}_3\text{CHO} > \text{CH}_3\text{COCH}_3 > \text{HCHO}$
 d. $\text{HCHO} > \text{CH}_3\text{CHO} > \text{CH}_3\text{COCH}_3$
26. Which among the following is a feature of adiabatic expansion?
 a. $\Delta V < 0$ b. $\Delta U < 0$
 c. $\Delta U > 0$ d. $\Delta T = 0$
27. Molarity is defined as
 a. the number of moles of solute dissolved in 1 dm^3 of the solution
 b. the number of moles of solute dissolved in 1 kg of solvent
 c. the number of moles of solute dissolved in 1 dm^3 of the solvent
 d. the number of moles of solute dissolved in 100 mL of the solvent
28. What is the possible number of monohydroxy derivatives of a hydrocarbon consisting of five carbon atoms with one methyl group as a branch?
 a. 2 b. 3
 c. 4 d. 5
29. What is the amount of work done when two moles of ideal gas is compressed from a volume of 1 m^3 to 10 dm^3 at 300 K against a pressure of 100 kPa ?
 a. 99 kJ b. -99 kJ
 c. 114.9 kJ d. -114.9 kJ
30. Which among the following alloys is used in making instruments for electrical measurements?
 a. Stainless steel
 b. Manganin
 c. Spiegeleisen
 d. Duralumin
31. Which of the following proteins is globular?
 a. Collagen b. Albumin
 c. Myosin d. Fibroin
32. A mixture of benzaldehyde and formaldehyde when treated with $50\% \text{ NaOH}$ yields
 a. sodium benzoate and sodium formate
 b. sodium formate and benzyl alcohol
 c. sodium benzoate and methyl alcohol
 d. benzyl alcohol and methyl alcohol
33. Which among the following solutions is not used in determination of the cell constant?
 a. 10^{-2} M KCl b. 10^{-1} M KCl
 c. 1 M KCl d. Saturated KCl
34. Which halogen forms an oxyacid that contains the halogen atom in tripositive oxidation state?
 a. Fluorine b. Chlorine
 c. Bromine d. Iodine
35. Name the metal that is purified by placing the impure metal on sloping hearth of a reverberatory furnace and heating that above its melting point in the absence of air.
 a. Mercury b. Gallium
 c. Zirconium d. Copper
36. Which among the following is a tranquilizer?
 a. Aspirin b. Valium
 c. Penicillin d. Sulphanilamide
37. Chlorination of ethane is carried out in the presence of
 a. anhydrous AlBr_3 b. mercuric chloride
 c. ultraviolet light d. zinc chloride
38. Identify a 'chemical twin' among the following.
 a. Zr-Ta b. Nb-Tc
 c. Hf-Re d. Nb-Ta

39. The relationship between rate constant and half-life period of zero order reaction is given by
- a. $t_{1/2} = [A_0] 2k$ b. $t_{1/2} = \frac{0.693}{k}$
 c. $t_{1/2} = \frac{[A_0]}{2k}$ d. $t_{1/2} = \frac{2[A_0]}{k}$
40. Which polymer among the following does not soften on heating?
- a. Bakelite b. Polythene
 c. Polystyrene d. PVC
41. van't Hoff factor of centimolar solution of $K_3[Fe(CN)_6]$ is 3.333. Calculate the per cent dissociation of $K_3[Fe(CN)_6]$.
- a. 33.33 b. 0.78 c. 78 d. 23.33
42. Which of the following compounds is most acidic in nature?
- a. 4-chlorobutanoic acid
 b. 3-chlorobutanoic acid
 c. 2-chlorobutanoic acid
 d. Butanoic acid
43. How is ore of aluminium concentrated?
- a. Roasting
 b. Leaching
 c. Froth floatation
 d. Using Wilfley table
44. Which of the following compounds has highest boiling point?
- a. Propan-1-ol b. *n*-butane
 c. Chloroethane d. Propanal
45. Which metal among the following has the highest packing efficiency?
- a. Iron b. Tungsten
 c. Aluminium d. Polonium
46. Which oxoacid of sulphur contains S—S bond in its structure?
- a. Disulphurous acid
 b. Disulphuric acid
 c. Perdisulphuric acid
 d. Hydrosulphurous acid
47. Which among the following detergents is non-ionic in character?
- a. Sodium lauryl sulphate
 b. Pentaerythrityl stearate
 c. Cetyl trimethyl ammonium chloride
 d. Sodium *n*-dodecyl benzene sulphonate
48. Reaction of which among the following ethers with HI in cold leads to the formation of methyl alcohol?
- a. Ethyl methyl ether
 b. Methyl propyl ether
 c. Isopropyl methyl ether
 d. *tert*-butyl methyl ether
49. During conversion of glucose into glucose cyanohydrin, which functional group/atom of glucose is replaced?
- a. Hydrogen
 b. Aldehydic group
 c. Primary alcoholic group
 d. Secondary alcoholic, group
50. Half-life period of a first order reaction, $A \rightarrow$ product is 6.93 h. What is the value of rate constant?
- a. 1.596 h^{-1} b. 0.1 h^{-1}
 c. 4.802 h^{-1} d. 10 h^{-1}