# VITEEE physics 2013

1. Two balls of equal masses are thrown upwards along the same vertical direction at an interval of 2 s,with the same initial velocity of 39.2 m/s. The two balls will collide at a height of

    (a) 39.2 m     (b) 73.5 m

    (c) 78.4 m     (d) 117.6 m

2. The dimensional formula of magnetic flux is

    (a) $[M^1L^2T^{-1}A^{-2}]$     (b) $[M^1L^2T^{-2}A^{-1}]$

    (c) $[M^1L^2T^{-1}A^{-1}]$     (d) $[M^1L^0T^{-2}A^{-1}]$

3. The time dependence of a physical quantity P is given by $P=P_0 e\alpha P(-\alpha t^2)$, where $\alpha$ is a constant and t is time. The constant $\alpha$

    (a) is a dimensionless     (b) has dimensions of P

    (c) has dimensions of $T^{-2}$     (d) has dimensions of $T^2$

4. If the potential energy of a gas molecule is $U = \dfrac{M}{r^6} - \dfrac{N}{r^{12}}$, M and N being positive constants, then the potential energy at equilibrium must be
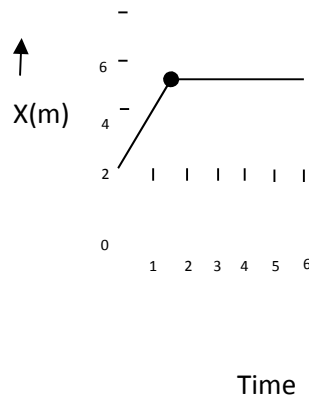
    (a) zero     (b) $NM^2/4$

    (c) $MN^2/4$     (d) $M^2/4N$

5. A table fan rotating at a speed of 2400 rpm is switched off and the resulting variation of revolution/minute with time is shown in figure. The total number of revolutions of the fan before it, comes to rest is
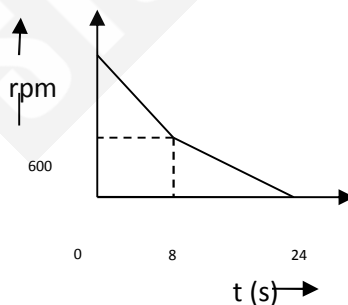


    (a) 160   (b) 280   (c) 380   (d) 420

6. In the adjoining figure, the position time graph of a particle of mass 0.1 kg is shown. The impulse at t = 2 s is



Time

(a) 0.02 kg m/s          (b) 0.1 kg m/s

(c) 0.2 kg m/s           (d) 0.4 kg m/s

7. The pressure on a square plate is measured by measuring the force on the plate and the length of sides of the plate and the length of sides of the plate. If the maximum error in the measurement of force and length are respectively 4% and 2%, then the maximum error in the measurement of pressure is

(a) 1%    (b) 2%    (c) 4%    (d) 8%

8. The centre of a wheel rolling on a plane surface moves with a speed $v_0$. A particle on the rim of the wheel at the same level as the centre will be moving at speed

(a) zero    (b) $v_0$    (c) $2v_0$    (d) $\sqrt{2}\, v_0$

9. A body of mass 5 m initially at rest explodes into 3 fragments with mass ratio 3:1:1. Two of fragments each of mass 'm' are found to move with a speed of 60 m/s is mutually perpendicular directions. The velocity of third fragment is

(a) $10\sqrt{2}$          (b) $20\sqrt{2}$

(c) $20\sqrt{3}$          (d) $60\sqrt{2}$

10. A body of mass 2 kg moving with velocity of 6 m/s strikes in elastically with another body of same mass mass at rest. The amount of heat evolved during collision is

(a) 18 J    (b) 36 J    (c) 9 J    (d) 3 J

11. Two particles of equal mass m go round a circle of redius R under the action of their mutual gravitational attraction. The speed of each particle is

(a) $\frac{1}{2}\sqrt{\frac{Gm}{R}}$    (b) $\sqrt{\frac{4\,Gm}{R}}$

(c) $\sqrt{\frac{Gm}{2R}}$    (d) $\frac{1}{2R}\sqrt{\frac{1}{Gm}}$

12. Four equal charges Q each are placed at four corners of a square of side a each. Work done in carrying a charge –q from its centre to infinity is

(a) zero    (b) $\frac{\sqrt{2q}}{\pi\epsilon_0 a}$

(c) $\frac{q^2}{2\pi\epsilon_0 a}$    (d) $\frac{\sqrt{2q^2}}{\pi\epsilon_0 a}$

13. A network of resistances, cell and capacitor C( = 2 $\mu$ F) is shown in adjoining figure.In steady state condition, the charge on 2$\mu$F ₄Ω ᵢtor is Q, while R is unknown resistance. Values of Q and R are respective.,
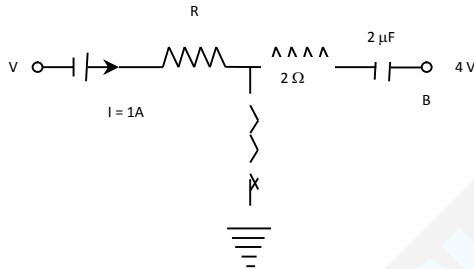


(a) 4 $\mu$C and 10 $\Omega$
(b) 4 $\mu$C and 4 $\Omega$
(c) 2 $\mu$C and 2 $\Omega$
(d) 8 $\mu$C and 4 $\Omega$

14. As the electron in Bohr's orbit of hydrogen atom passes from state n =2 to,n =1 , the KE (K) and the potential energy (U) changes as

(a) K four fold, U also four fold

(b) K two fold, V also two fold

(c) K four fold, U two fold

(d) K two fold, U four fold

15. To get an OR gate from a NAND gate, we need

(a) Only two NAND gates

(b) Two NOT gates obtained

(c) Four NAND gates and two AND gates obtained from NAND gates

(d) None of the above

16. If a current I is flowing in a loop of radius r as shown in adjoining figure, then the magnetic field induction ate the centre O will be
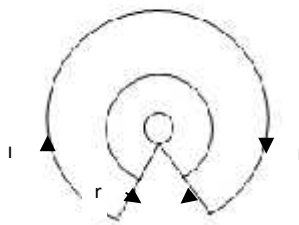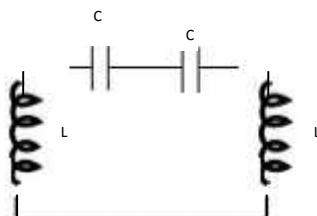


(a) Zero    (b) $\frac{\mu_0 I \theta}{4 \pi r}$

(c) $\frac{\sim_0 I \sin\theta}{4 \pi r}$    (d) $\frac{2 \mu_0 I \sin\theta}{4 \pi r^2}$

17. Two indentical magnetic dipoles of magnetic moment 1.0 Am² each,placed at a separation of 2 m with their axes perpendicular to each other. The resultant magnetic field at a p[oint midway between the dipoles is

(a) $\sqrt{5}$ x $10^{-7}$ T

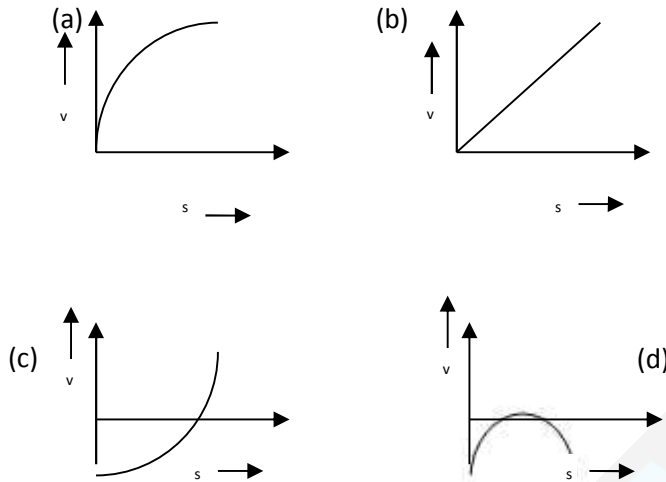(b) 5 x$10^{-7}$ T

(c) $10^{-7}$ T

(d) 2 x $10^{-7}$ T

18. The natural frequency of the circuit shown in adjoining figure is



(a) $\frac{1}{2\pi\sqrt{LC}}$    (b) $\frac{1}{2\pi\sqrt{2LC}}$
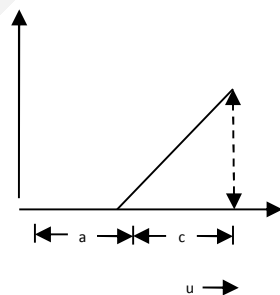
(c) $\dfrac{2}{2\pi\sqrt{LC}}$    (c) zero

19. A lead shot of 1 m diameter falls through a long column of glycerine. The variation of the velocity v with distance covered (s) is correctly represented by



20. If $\varepsilon_0$ and $\mu_0$ represent the permittivity and permeability of vaccum and $\varepsilon$ and $\mu$ represent the prmittivity and permeability of medium, then refractive index of the medium is given by

(a) $\sqrt{\dfrac{\varepsilon_0\mu_0}{\varepsilon\mu}}$    (b) $\sqrt{\dfrac{\varepsilon\mu}{\varepsilon_0\mu_0}}$

(c) $\sqrt{\dfrac{\varepsilon_0\mu_0}{\varepsilon}}$    (d) $\sqrt{\dfrac{\varepsilon_0\mu_0}{\mu}}$

21. A students plots a graph between inverse of magnification 1/m produced by a convex thin lines and the object distance u as shown in figure. What was the focal length of the lens used?

STUDYNAMA.COM - POWERING ENGINEERS, MANAGERS, DOCTORS & LAWYERS.

Visit us for FREE lecture notes, study guides, e-books, presentations, reports, exam papers, guess papers and so much more! CLICK HERE NOW!

(a) $\dfrac{b}{ca}$      (b) $\dfrac{bc}{a}$

(c) $\dfrac{c}{b}$      (d) $\dfrac{b}{c}$

22. Two waves $y_1 = A_1\sin(\omega t - \beta_1)$ and $y_2 = A_2 \sin(\omega t - \beta_2)$ supeermose to form a resultant wave whose amplitude is

(a) $A_1 + A_2$

(b) $|A_1 + A_2|$

(c) $\sqrt{A_1{}^2 + A_2{}^2\ 2A_1A_2\sin(s^!_1 - s^!_2)}$

(d) $\sqrt{A_1{}^2 + A_2{}^2\ 2A_1A_2\cos(s^!_1 - s^!_2)}$

23. When a certain metallic surface is illuminated with monochromatic light of wavelength $\lambda$, the stopping potential for photoelectric current $3V_0$. When the same surface is illuminated with a light of wave length $2\lambda$, the stopping potential is $V_0$. The threshold wavelength for this surface to photoelectric effect is

(a) $4\lambda$      (b) $6\lambda$

(c) $8\lambda$      (d) $\dfrac{4}{3}\lambda$

24. In the V-T diagram shown in adjoining figure, what is the relation between $p_1$ and $p_2$ ?
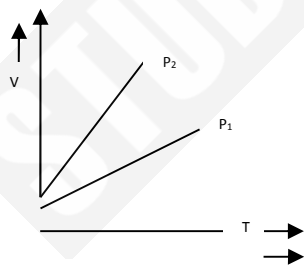


(a) $P_2 = p_1$      (b) $P_2 < p_1$

(c) $P_2 > p_1$      (d) insufficient data

25. If a gas mixture contains 2 moles of $O_2$ and 4 moles of Ar at temperature T, then what will bne then total energy of the system of the system (neglecting all vibrational modes)

(a) 11 RT

(b) 15 RT

(c) 8 RT

(d) RT

26. In the adjoining figure, two pulses in a stretched string are shown. If initially their centres are 8 cm apart and they are moving towards each other, with speed of 2cm/s, then total energy of the pulses after 2 s will be
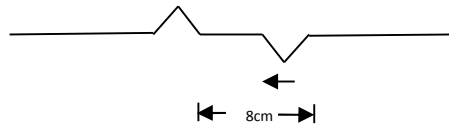


(a) Zero
(b) Purely kinetic
(c) Purely potential
(d) Partly kinetic and partly potential

27. When two waves of almost equal frequency $n_1$ and $n_2$ are produced simultaneously, the the time interval between succesive maxima is

(a) $\dfrac{1}{n_1+n_2}$   (b) $\dfrac{1}{n_1}+\dfrac{1}{n_1}$

(c) $\dfrac{1}{n_1}-\dfrac{1}{n_1}$   (d) $\dfrac{1}{n_1-n_2}$

28. A long glass capillary tube is dipped in water. It is unknown that water wets glass. The water level rises by h in the tube. The tube is now pushed down so that only a length h/2 is outside the water surface. The angle of contact at the water surface at the upper end of the tube will be

(a) $\tan^{-1}2$   (b) $60^0$

(c) $30^0$   (d) $15^0$

29. In the adjoining circuit, if the reading of voltmeter $V_1$ and $V_2$ are 300 volts each, then the reading voltmeter                                                    $V_3$ and ammeter A are respectively



220 V, 50 Hz
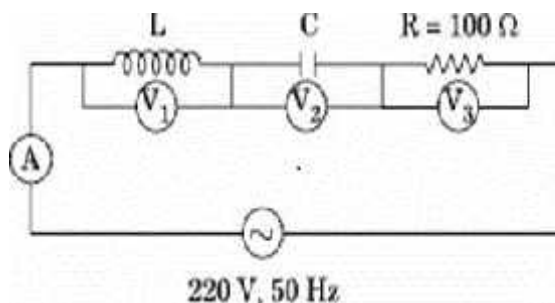
(a) 220 V , 2.2 A
(b) 100 V , 2.0 A
(c) 220 V , 2.0 A
(d) 100 V , 2.2 A

30. if the work done in turning a magnet of magnetic moment M by an angle of $90^0$ from the magnetic meridian is n times the corresponding work done to turn it through an angle of $60^0$, then the value of n is

(a) 1     (b) 2

(b) ½     (d) ¼

31. The capacitance of a parallel plate capacitor with air as dielectric is C. If a slab of dielectric constant K and of the same thickness as the separation between the plates is introduced so as to fill $1/4^{th}$ of the capacitor (shown in figure), then the new capacitance is
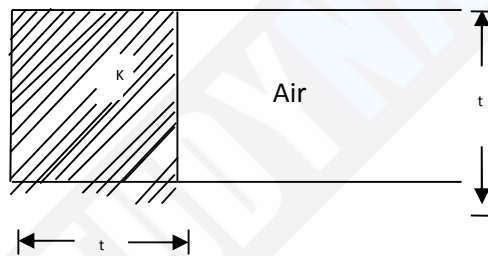


(a) $(K+2)\frac{C}{4}$
(b) $(K+3)\frac{C}{4}$
(c) $(K+1)\frac{C}{4}$
(d) None of these

32. Seven resistance are connected between points A and B as shown in figure. The equivalent resistance between A and B is



10 Ω

(a) 5 Ω     (b) 4.5 Ω

(c)   4 Ω     (d) 3 Ω
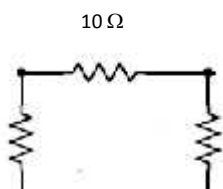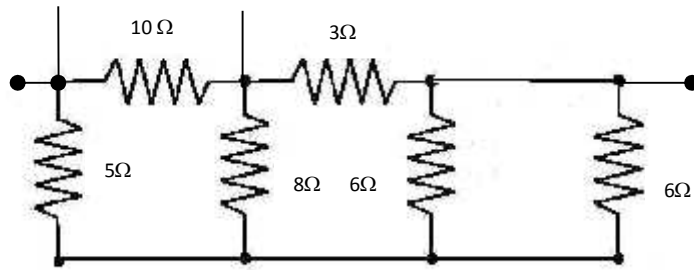
33. The amplitude of an electromagnetic wave in vaccum is doubled with no other changes made to the wave. As a result of this doubling of the amplitude, which of the following statement is correct?

     (a) The frequency of the wave changes only

     (b) The wave length of the wave changes only

     (c) The speed of the wave propagation changes only

     (d) Alone of the above is correct

34. An element with atomic number Z = 11 emits $K_\alpha$ - X ray of wavelength $\lambda$. The atomic number which emits $K_\alpha$ - X-ray of wavelength $4\lambda$ is

     (a) 4     (b) 6

     (c) 11     (d) 44

35. Mobilities of electrons and holes in a sample of intrinsic germanium at room temperature are $0.36 m^2 V^{-1}s^{-1}$. The electron and hole densities are each equal to $2.5 \times 10^{19} m^3$. The electrical conductivity of germanium is

     (a) 4.24 $Sm^{-1}$     (b) 2.12 $Sm^{-1}$

     (c) 1.09 $Sm^{-1}$     (d) 0.47 $Sm^{-1}$

36. If a radio-receiever amplifies all the signal frequencies equally well, it is said to have high

     (a) sensitivity     (b) selectivity

     (c) distortion     (d) fidelity

37. If a progressive wave is represented as $y = 3 \sin \pi\left(\frac{t}{2} - \frac{x}{4}\right)$ where x is in meter and t is in second, then the distance travelled by the wave in 5 s is

  (a) 5 m      (b) 10 m

  (c) 25 m      (d) 32 m

38. The gravitational potential at a place varies inversely with $x^2$ (i.e., $V = k/x^2$), the gravitational field at that place is

  (a) $2k/x^3$      (b) $-2k/x^3$

  (c) $k/x$      (d) $-k/x$

39. A copper wire of length 2.2 m and a steel wire of length 1.6 m, both of diameter 3.0 mm are connected end to end. When stretched by a force, the electrogation in length 0.50 mm is produced in the copper wire. The stretching force is

  $(Y_{cu} = 1.1 \times 10^{11} \text{ N/m}^2$ ,

  $Y_{steel} = 2.0 \times 10^{11} \text{ N/m}^2)$

  (a) $5.4 \times 10^2$ N      (b) $3.6 \times 10^2$ N

  (b) $2.4 \times 10^2$ N      (d) $1.8 \times 10^2$ N

40. If $\bar{v}$, $v_{rms}$ and $v_p$ represent the mean speed, root mean square and most probable speed of the molecules in an ideal monoatomic gas at temperature T and if m is mass of the molecule, then

  (a) $v_p < v < v_{rms}$

  (b) no molecule can have a speed greater than $\sqrt{2}\ v_{rms}$

  (c) no molecule can have a speed less than $v_p/\sqrt{2}$

  (d) None of the above

# VITEEE chemistry 2013

1. Treating anisole with the following reagents, the major product obtained is I. $(CH_3)_3$ CCl,AlCl$_3$   II. Cl$_2$, FeCl$_3$   III. HBr, Heat

(a)



(b)



(c)



(d)
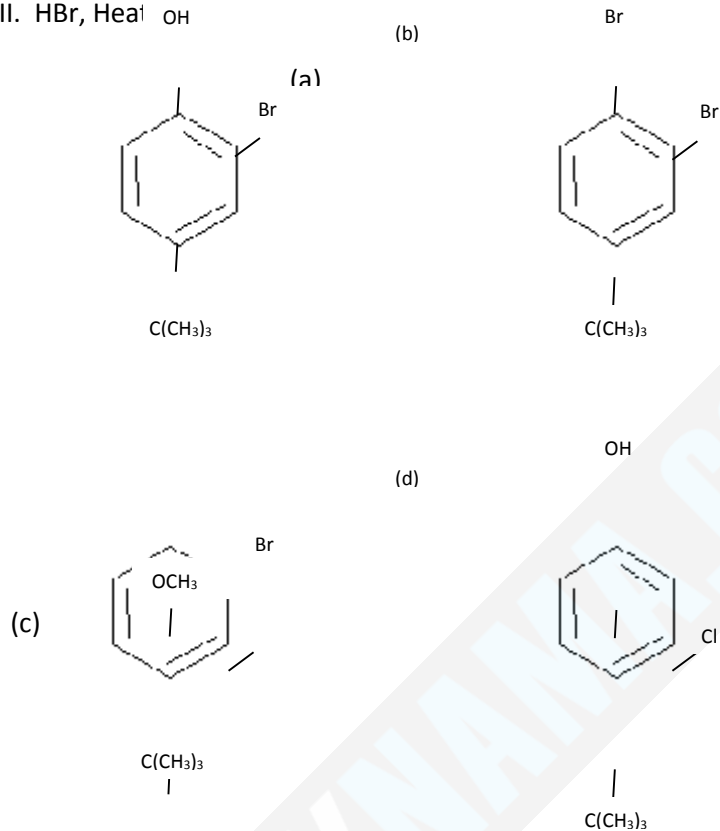


2. Ketones [R – C – R'] where, R = R' = alkyl group can be obtained in one step by
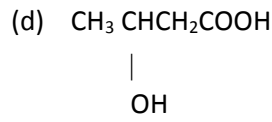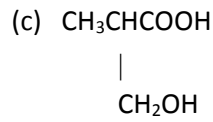   $\parallel$
   O

   Group can be obtained in one step by
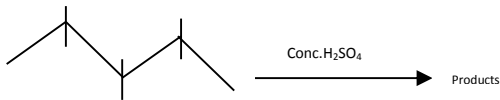
   (a) Hydrolysis of esters
   (b) Oxidation of primary alcohols
   (c) Oxidation of secondary alcohols
   (d) Reaction of acid halide with alcohols

3. An optically active compound 'X' has molecular formula $C_4H_8O_3$. It evolves $CO_2$ with aqueous NaHCO$_3$. 'X' reacts with LiAlH$_4$ to give an achiral compound.'X' is

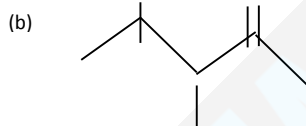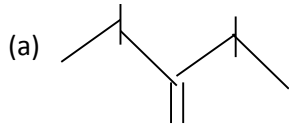   (a) CH$_3$CH$_2$C HCOOH        (b) CH$_3$ C HCOOH

$$|$$
$$OH \qquad\qquad\qquad OMe$$

(c) $CH_3CHCOOH$
$$|$$
$$CH_2OH$$

(d) $CH_3\ CHCH_2COOH$
$$|$$
$$OH$$

4.



$$\xrightarrow{Conc.H_2SO_4}\ Products$$

Product is/are

(a)    (b) 

(c)   Both (a) and (b)   (d)   None is correct

5.  Glycerol $\xrightarrow[A]{KHSO_4}\ \xrightarrow[]{HClO}\ B$

A and B respectively are

(a)
$$O \qquad\qquad\qquad O$$
$$\parallel \qquad\qquad\qquad \parallel$$
$$CH_2 = CH\ CH \qquad CH_2 -CH\ CH$$
$$\qquad\qquad\qquad\qquad |\qquad |$$
$$\qquad\qquad\qquad\qquad Cl\qquad OH$$

(b)
$$O \qquad\qquad\qquad O$$
$$\parallel \qquad\qquad\qquad \parallel$$
$$CH_2 = CH\ CH \qquad CH_2 -CH\ CH$$
$$\qquad\qquad\qquad\qquad |\qquad |$$
$$\qquad\qquad\qquad\qquad OH\qquad CL$$

(c)   $CH_3CH_2CHO,$   $\qquad$ Cl   H_2CH
$$\qquad\qquad\qquad\qquad OH$$

(d)   $\qquad O$
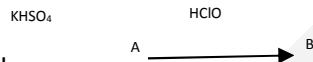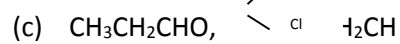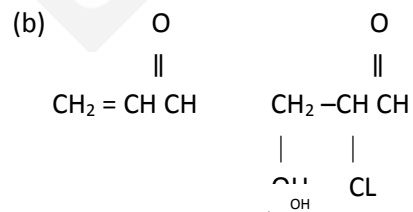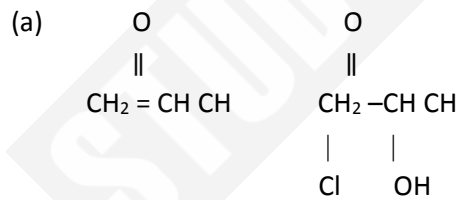
$$\text{CH}_2=\text{CHCH} \qquad \overset{\parallel}{\text{CH}_2\text{CH}_2\text{CHO}}$$
$$\underset{\text{CIO}}{\vert}$$
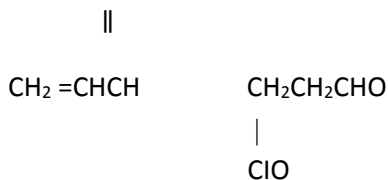
6. Phenol is heated with phthalic anhydride in the presence of conc. $H_2SO_4$. The product gives pink colour with alkali. The product is

     (a) phenolphthalein

     (b) Bakelite

     (c) salicylic acid

     (d) flurorescein

7. $C_6H_5NH_2 \xrightarrow[0^0 C]{\text{NaNO}_2/\text{HCL}} X \xrightarrow{\text{CuCN}}$

$Y \xrightarrow{\text{H}_2\text{O/H}^+}$ Z, Z is defined as

     (a) $C_6H_5$ –NH-$CH_3$
     (b) $C_6H_5$ –$CH_2$ –$NH_2$
     (c) $C_6H_5$ –$CH_2$ –COOH
     (d) $C_6H_5$-COOH

8. B can be obtained from halide by van-Arkel method. This involves reaction
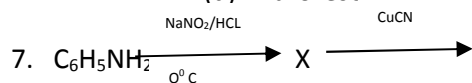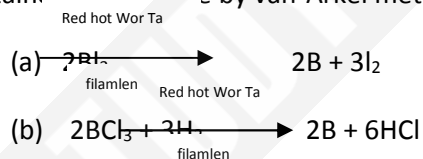
     (a) $2BI_3 \xrightarrow[\text{filamlen}]{\text{Red hot Wor Ta}} 2B + 3I_2$

     (b) $2BCl_3 + 3H_2 \xrightarrow[\text{filamlen}]{\text{Red hot Wor Ta}} 2B + 6HCl$

     (c) Both (a) and (b)

     (d) None of the above

9. $NH_4Cl(s)$ is heated in a test tube. Vapours are braught in contact with red litmus paper, which changes it to blue and then to red. It is because of

     (a) formation of $NH_4OH$ and HCL

     (b) formation of $NH_3$ and HCL

     (c) greater diffusion of $NH_3$ than HCL

     (d) greater diffusion of HCL than $NH_3$

10. Out of $H_2S_2O_3$, $H_2S_2O_4$, $H_2SO_5$ and $H_2S_2O_s$ peroxy acids are

  (a) $H_2S_2O_3$, $H_2S_2O_8$
  (b) $H_2SO_5$, $H_2S_2O_8$
  (c) $H_2S_2O_4$, $H_2SO_5$
  (d) $H_2S_2O_3$, $H_2S_2O_4$

11. The density of solid argon is 1.65 g per cc at $-233^0C$. If the argon atom is assumed to be a sphere of radius $1.54 \times 10^{-8}$ cm, what per cent of solid argon is apparently empty space? (Ar = 40)

  (a) 16.5%
  (b) 38%
  (b) 50%
  (d) 62%

12. When 1 mole of $CO_2(g)$ occupying volume 10L at $27^0C$ is expended under adiabatic condition, temperature falls to 150 K. Hence, final volume is

  (a) 5 L   (b) 20 L   (c) 40 L   (d) 80 L

13. Acid hydrolysis of ester is first order reaction and rate constant is given by

$$K = \frac{2.303}{t} \log \frac{V_\infty - V_0}{V_\infty - V_t}$$

Where, $V_0$, $V_t$ and $V_\infty$ are the volumle of standar6d NaOH required to neutralize acid present at a given time, if ester is 50% neutralized then

  (a) $V_\infty = V_t$
  (b) $V_\infty = (V_t - V_0)$
  (c) $V_\infty = 2V_t - V_0$
  (d) $V_\infty = 2V_t + V_0$

14. A near UV photon of 300 nm is absorbed by a gas and then re-emitted as two photons. One photon is red with wavelength of the second photon is

  (a) 1060 nm

  (b) 496 nm

  (c) 300 nm

  (d) 215 nm

15. Which of these ions is expected to be coloured in aqueous solution?

  I. $Fe^{3+}$ II. $Ni^{2+}$ III $Al^{3+}$

  (a) I and II   (b) II and III

  (c) I and III   (d) I, II and III

16. Select the correct statements(s).

(a) LiAH$_4$ reduces methyl cyanide to methyl amine

(b) Alkane nitrile has electrophilic as well as nucleophilic centres

(c) separation is a reversible reaction

(d) Alkaline hydrolysis of methasne nitrile forms methanoic acids

17. 
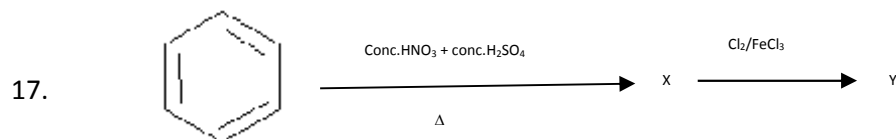
The product Y is

(a) P-choloro nitrobenzene
(b) O-chloro nitrobenzene
(c) M-chloro nitrobenzene
(d) O,p-dichloro nitrobenzene

18. End product of the following reaction is
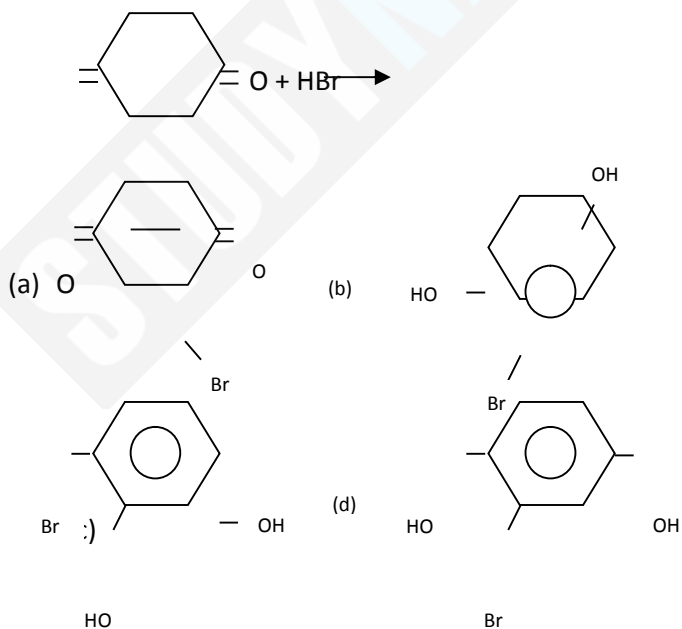


19. Following compounds are respectively … geometrical isomers

STUDYNAMA.COM - POWERING ENGINEERS, MANAGERS, DOCTORS & LAWYERS.

Visit us for FREE lecture notes, study guides, e-books, presentations, reports, exam papers, guess papers and so much more! CLICK HERE NOW!
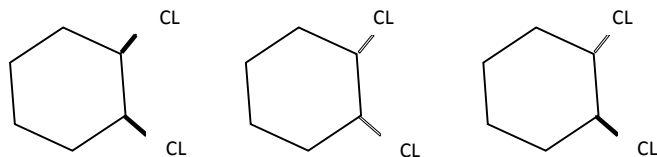
|     |       | P     | Q     | R     |
|-----|-------|-------|-------|-------|
| (a) | Cis   | cis   | trans |
| (b) | Cis   | trans | trans |
| (c) | Trans | cis   | cis   |
| (d) | Cis   | trans | cis   |

20. Which is more basic oxygen in an ester

$$O^\alpha$$
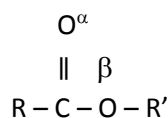$$\| \quad \beta$$
$$R - C - O - R'$$

(a) Carbonyl oxygen, $\alpha$
(b) Carbonyl oxygen, $\beta$
(c) Equally basic
(d) Both are acidic oxygen

21. I a Claisen condensation reaction (when an ester is treated with a strong base)

(a) a proton is removed from the $\alpha$-carbon to form a resonance stabillised carbanion of the ester

(b) carbanium acts as a nucleophile in a nucleophilic acyl substitution reaction with another ester molecule

(c) a new C-C bons is formed

(d) All of the above statements are correct

22. An organic compound B is formed by the reaction of ethyl magnesium iodide with a substance A, followed by treatment with dilute aqueous acid, Compound B does not react with PCC or PDC in dichloromethane. Which of the follo-wing is a possible compound for A?

O

(a) CH$_2$ – CH$_2$

(b)         O                    (c)        O
            ‖                                ‖
    CH$_3$CH$_2$CCH$_3$              CH$_3$CH

(d)   $H_2C = O$

23.
$$\underset{\text{CH}_3\overset{\overset{\displaystyle O}{\|}}{C}\text{CH}_2\text{CH}_2\overset{\overset{\displaystyle O}{\|}}{C}\text{OCH CH}}{}$$

$$\xrightarrow[\text{(ii) } H_3O^+]{\text{(i) } CH_3MgBr \text{ (one mole)}} A$$
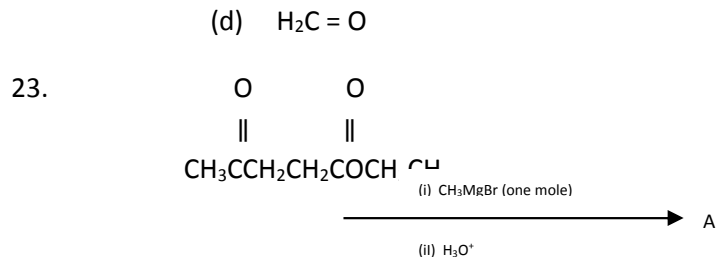
A formed in this reaction is

(a)
$$CH_3 \underset{\overset{\displaystyle |}{CH_3}}{\overset{\overset{\displaystyle OH}{\|}}{C}} CH_2\ CH_2\ \overset{\overset{\displaystyle O}{\|}}{C}OC3H_2CH_3$$

(b)
$$CH_3\ \overset{\overset{\displaystyle O}{\|}}{C}CH_2CH_2\overset{\overset{\displaystyle O}{\|}}{C}CH_3$$

(c)



(d)
$$CH_3\ \underset{\overset{\displaystyle |}{OH}}{\overset{\overset{\displaystyle CH_3}{|}}{C}} CH_2\quad CH_2\ \underset{\overset{\displaystyle |}{OH}}{\overset{\overset{\displaystyle CH_3}{|}}{C}} CH_3$$
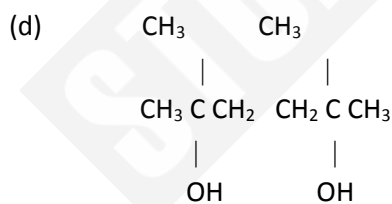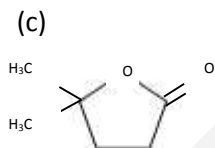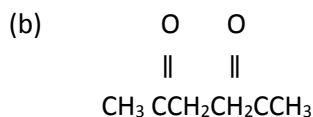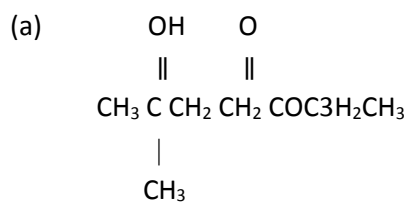
24. For the cell reaction $2Ce^{4+} + Co \rightarrow 2Ce^{3+} + Co^{3+}$ ; $E^0_{cell}$ is 1.89 V. If $E_{Co^{2+}/C_0}$ is $-0.28$ V, what is the value of $E_{Ce^{4+}/Ce^{3+}}^{0}$?

(a)  0.28 V    (b)  1.61 V    (c)  2.17 V    (d)  5.29 V

25. A constant current of 30 A is poassed through an aqueous solution of NaCL for a time of 1.00 h. What is the volume of $Cl_2$ gas at STP produced?

(a)  30.00 L    (b)  25.08 L    (c)  12.54 L    (d)  1.12 L

26. Consider the following reaction,



Boat                    chair
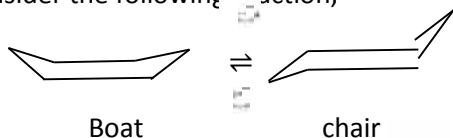
      The reaction is of first order in each diagram, with an equilibrium constant of $10^4$. For the conversation of chair form to boat from $e^{-E_a/RT} = 4.35 \times 10^{-8}$ m at 298 K with pre-exponetial factor of $10^{12}$ s$^{-1}$. Apparent rate constant (= $k_A / k_B$) at 298 K is

(a)   $4.35 \times 10^4$ s$^{-1}$   (b) $4.35 \times 10^8$ s$^{-1}$

(c)    $4.35 \times 10^{-8}$ s$^{-1}$   (d)   $4.35 \times 10^{12}$ s$^{-1}$

27. If for the cell reaction,

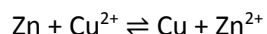$$Zn + Cu^{2+} \rightleftharpoons Cu + Zn^{2+}$$

Entropy change $\Delta S^0$ is 96.5 J mol$^{-1}$K$^{-1}$, then temperature coefficient of the emf of a cell is

(a)  $5 \times 10^{-4}$ VK$^{-1}$   (b)  $1 \times 10^{-3}$ VK$^{-1}$

(c)    $2 \times 10^{-3}$ VK$^{-1}$   (d)  $9.65 \times 10^{-4}$ VK$^{-1}$

28. What transition in the hydrogen spectrum would have the same wavelength as the Blasmer transition, n=4 to n=2 of He$^+$ spectrum?

(a)  n=4 to n=2     (b)  n=3 to n=2

(c)  n=2 to n=1     (d)  n=4 to n=3

29. What is the degeneracy of the level of H-atom that has energy $\left(-\frac{R_H}{9}\right)$?

(a)  16   (b)  9   (c)  4   (d)  1

30. Match the following and choose the correct option given below.

| | | | |
|---|---|---|---|
| A | Dry ice | I. | Anti-knocking |
| B | Semiconductor | II. | compound |
| C | Solder | III. | Electronic diode or |
| D | TEL | IV. | trode |
| | | | Joining circuit |
| | | | Referigerant for |
| | | | preserving food |

|  | A | B | C | D |
|---|---|---|---|---|
| (a) | I | II | IV | III |
| (b) | II | III | I | IV |
| (c) | IV | III | II | I |
| (d) | IV | II | III | I |

STUDYNAMA.COM - POWERING ENGINEERS, MANAGERS, DOCTORS & LAWYERS.

Visit us for FREE lecture notes, study guides, e-books, presentations, reports, exam papers, guess papers and so much more! CLICK HERE NOW!

31. Which of the following ligands is tetradenate?

(a)


(b)


(c)


(d)
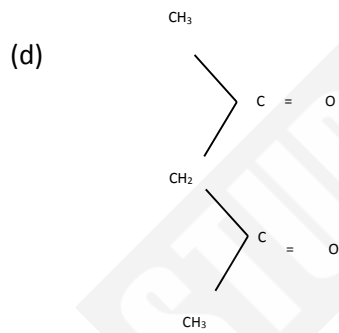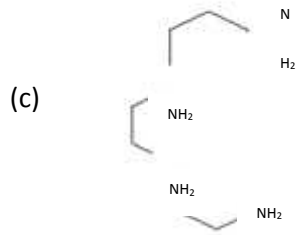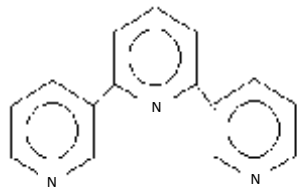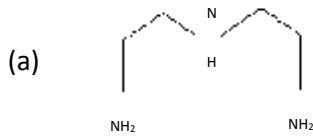

32. What is the EAN of $[Al(C_4O_4)_3]^{3-}$?

(a) 28    (b) 22    (c) 16    (d) 10

33. Which of the following does not undergo benzoin condensation?

(a)

$CH_2CHO$

(b)

$CHO$

(c) 

CHO

I

OCH₃

(d)

CHO

I

CH₃

34. 

 — COOH + NaHCO₃ →

 + COONa +
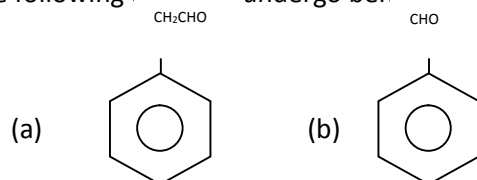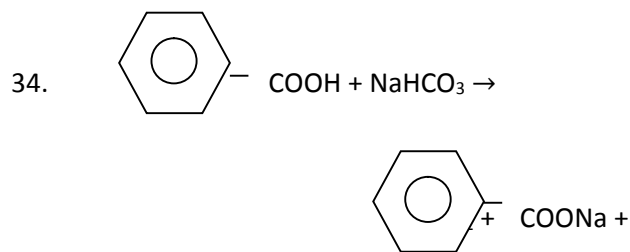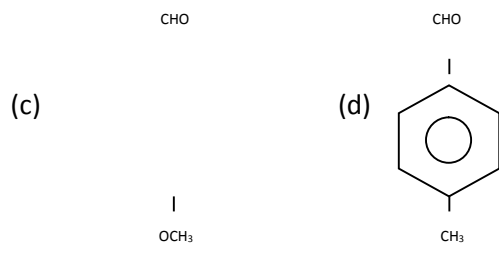
C is with the product

(a) CO₂

 COONa

(c) Both (a) and (b)

(d) None of the above

35. Benzene diazonium chloride on treatment with hypophosphorous acid and water yield benzene. Which of the mfollowing is used as a catalyst in this reaction?

(a) LiAlH₄

(b) Red p

(c) Zn

(d) Cu⁺

36. Consider the following reaction sequence, $CH_2COOH$

$$CH_2COOH \xrightarrow{p/Br_2} \xrightarrow[KOH]{Alcoholic} \xrightarrow{O_3, H_2O} A \quad B \quad C$$

CH₂  CF₃CO₃H

Alkaline

D

E

KMnO₄

Isomers are

(a) C and E
(b) C and D
(c) D and E
(d) C,D and E

37. When a monosaccharide forms a cyclic hemiacetal, the carbon atom that contained the carbonyl group is identified as the …. Carbon atom, because

(a) D, the carbonyl group is drawn to the right

(b) L, the carbonyl group is drawn to the left

(c) acetal, it forms bond to an –OR and an –OR'

(d) anomeric, its substituents can assume and $\alpha$ or $\beta$ position

38. Which of the following is/ are $\alpha$- amino acid?
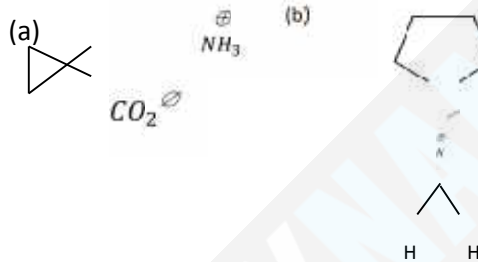


(c) Both (a) and (b)     (d) None of these

39. Calculate pH buffer prepared by adding 10 mL of 0.10 M acetic acid to 20 mL of 0.1 M sodium acetate [$pK_a$ ($CH_3COOH$) = 4.74]

(a) 3.00   (b) 4.44   (c) 4.74   (d) 5.04

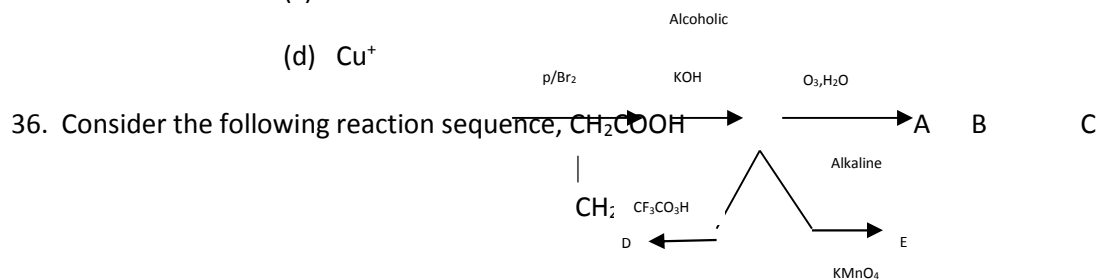40. The equivalent conductance of silver nitrate solution at $250^0C$ for an infinite dilution was found to be 133.3 $\Omega^{-1}$ $cm^2$ $equiv^{-1}$. The transport number of $Ag^+$ ions in very dilute solution of $AgNO_3$ is 0,464. Equivalent conductances of $Ag^+$ and $NO^-_3$ (in $\Omega^{-1}$ $cm^2$ $equiv^{-1}$) at infinite dilution are respectively

(a) 195.2, 133.3      (b) 61.9, 71.4

(c) 71.4, 61.9      (d) 133.3, 195.2

STUDYNAMA.COM - POWERING ENGINEERS, MANAGERS, DOCTORS & LAWYERS.

Visit us for FREE lecture notes, study guides, e-books, presentations, reports, exam papers, guess papers and so much more! CLICK HERE NOW!

1.  If N denote the set of all natural numbers and R be the relation on N x N defined by (a,b) R (c,d), if ad (b+c) = bc(a+d), then R is

    (a)  symmetric only

    (b)  reflexive only

    (c)  transitive only

    (d)  an equivalence relation

2.  A complex number z is such that $\arg\left(\frac{z-2}{z+2}\right) = \frac{z}{3}$. The points representing this complex number will lie on

    (a)  an ellipse       (b)  a parabola

    (c)  a circle          (d)  a straight line

3.  If $a_1, a_2$ and $a_3$ be any positive real numbers, then which of the following statement is not true ?

    (a)  $3a_1 a_2 a_3 \leq a^3{}_1 + a^3{}_2 + a_3{}^3$

    (b)  $\frac{a_1}{a_2} + \frac{a_2}{a_3} + \frac{a_3}{a_1} \geq 3$

    (c)  $(a_1 + a_2 + a_3)\left(\frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3}\right) \geq 9$

    (d)  $(a_1 . a_2 . a_3)\left(\frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3}\right)^3 \geq 27$

4.  If $| x^2 - x - 6 | = x + 2$, then the value of x are

    (a)  -2,2,-4        (b)  -2,2,4

    (c)  3,2,-2          (d)  4,4,3

5.  The centres of a set of circles, each of radius 3, lie on the circle $x^2 + y^2 = 25$. The locus of any point in the set is

    (a)  $4 \leq x^2 + y^2 \leq 64$      (b)  $x^2 + y^2 \leq 25$

    (c)  $x^2 + y^2 \geq 25$              (d)  $3 \leq x^2 + y^2 \leq 9$

6.  A tower AB leans towards West making an angle $\alpha$ with the vertical.The angular elevation of B, the top most most point of the tower is $\beta$ s asberved from a point C due East of A at a distance 'd' from A. If

the angular elevation of B from a point D due East of C at a distance 2d from C is r, then 2 tan $\alpha$ can be given as

(a) $3 \cot \beta - 2 \cot \gamma$    (b) $3 \cot \gamma - 2 \cot \beta$

(c) $3 \cot \beta - \cot \gamma$    (d) $\cot \beta - 2 \cot \gamma$

7. If $\alpha$ and $\beta$ are roots of $x^2 - ax + b = 0$ and $\alpha^n + \beta^n = V_n$, then

(a) $V_{n+1} = aV_n + bV_{n-1}$

(b) $V_{n+1} = aV_n + aV_{n-1}$

(c) $V_{n+1} = aV_n - bV_{n-1}$

(d) $V_{n+1} = aV_{n-1} - aV_n$

8. The sum of the series

$\sum_{r=0}^{n} (-1)^r \, {}^nC_r \left( \frac{1}{2^r} + \frac{3^r}{2^{2r}} + \frac{7^r}{2^{3r}} + \frac{15^r}{2^{4r}} + \cdots m \, terms \right)$ is

(a) $\dfrac{2^{mn}-1}{2^{mn}(2^n-1)}$    (b) $\dfrac{2^{mn}-1}{2^n-1}$

(c) $\dfrac{2^{mn}+1}{2^n+1}$    (d) None of these

9. The angle of intersection of the circles $x^2 + y^2 - x + y - 8 = 0$ and
$$X^2 + y^2 + 2x + 2y - 11 = 0$$

(a) $\tan^{-1}\left(\frac{19}{9}\right)$    (b) $\tan^{-1}(19)$

(c) $\tan^{-1}\left(\frac{9}{19}\right)$    (d) $\tan^{-1}(9)$

10. The vector $b = 3j + 4k$ is to be written as the sum of vector $b_1$ parallel to a $= i+j$ and a vector $b_2$ perpendicular to a. Then $b_1$ is equal to

(a) $\frac{3}{2}(i+j)$    (b) $\frac{2}{3}(i+j)$

(c) $\frac{1}{2}(i+j)$    (d) $\frac{1}{3}(i+j)$

11. If the points $(x_1, y_1), (x_2, y_2)$ and $(x_3, y_3)$ are collinear, then the rank of the matrix $\begin{bmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{bmatrix}$ will

always be less than

(a) 3    (b) 2    (c) 1    (d) None of these

12. The value of the determinant

$$\begin{vmatrix} 1 & \cos(\alpha - \beta) & \cos\alpha \\ \cos(\alpha - \beta) & 1 & \cos\beta \\ \cos\alpha & \cos\beta & 1 \end{vmatrix}$$ is

(a) $\alpha^2 + \beta^2$    (b) $\alpha^2 - \beta^2$

(c) 1    (d) 0

13. The number of integral values of K, for which the equation 7 cos x+5 sin x = 2K+1 has a solution, is

(a) 4    (b) 8    (c) 10    (d) 12

14. The line joining two points A(2,0),B(3,1) is rotated about A in anti-clockwise direction through an angle of $15^0$. The equation of the line in the now position,is

(a) $\sqrt{3}x - y - 2\sqrt{3} = 0$    (b) $x - 3\sqrt{y-2} = 0$

(c) $\sqrt{3}x + y - 2\sqrt{3} = 0$    (d) $x + 3\sqrt{y-2} = 0$

15. The line $2x + \sqrt{6}y = 2$ is a tangent to the curve $x^2 - 2y^2 = 4$. The point of contact is

(a) $(4, -\sqrt{6})$    (b) $(7, -2\sqrt{6})$

(c) $(2,3)$    (d) $(\sqrt{6},1)$

16. The number o-f integral points (integral point means both the coordinates should be integer) exactly in the interior of the triangle with vertices (0,0),(0,21) and (21,0) is

(a) 133    (b) 190    (c) 233    (d) 105

17. $\int(1 + x - x^{-1}) e^{x+x^{-1}}dx$ is equal to

(a) $(x+1) e^{x+x^{-1}}+C$    (b) $(x-1) e^{x+x^{-1}}+C$

(c) $xe^{x+x^{-1}}+C$    (d) $xe^{x+x^{-1}}x+C$

18. If f(x) = x-[x], for every real number x,where [x] is the integral part of x,Then, $\int_{-1}^{1} f(x)dx$ is equal to

(a) 1    (b) 2    (c) 0    (d) $\frac{1}{2}$

19. The value of the integral $\int_{-1/2}^{1/2} \left[\left(\frac{x+1}{x-1}\right)^2 + \left(\frac{x-1}{x+1}\right)^2 - 2\right]^{1/2} dx$ is

(a) $\log\left(\frac{4}{3}\right)$    (b) $4 \log\left(\frac{3}{4}\right)$

(c) $4\log\left(\frac{4}{3}\right)$   (d) $\log\left(\frac{3}{4}\right)$

20. If a tangent having slope of $-\frac{4}{3}$ to the ellipse $\frac{x^2}{18}+\frac{y^2}{32}=1$ intersects the major and minor axes in points A abd B respectively,then the area of $\triangle$OAB is equal to (O is the centre of the ellipse)

(a) 12 sq units    (b) 48 sq units

(c) 64 sq units    (d) 24 sq units

21. The locus of mid points of tangents intercepted between the axes of ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ will be

(a) $\frac{a^2}{x^2}+\frac{b^2}{y^2}=1$    (b) $\frac{a^2}{x^2}+\frac{b^2}{y^2}=2$

(c) $\frac{a^2}{x^2}+\frac{b^2}{y^2}=3$    (d) $\frac{a^2}{x^2}+\frac{b^2}{y^2}=4$

22. If PQ is a double ordinate of hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$. Such that OPQ is an equilateral triangle,O being the centre of the hyperbola, Then the eccentricity 'e' of the hyperbola satisfies

(a) $1<e<\frac{2}{\sqrt{3}}$    (b) $e=\frac{2}{\sqrt{3}}$

(c) $e=\frac{\sqrt{3}}{2}$    (d) $e>\frac{2}{\sqrt{3}}$

23. The sides AB,BC and CA of a $\triangle$ ABC have respectively 3,4 and 5 points lying on them.The number triangles that can be constructed using these points as vertices is

(a) 205    (b) 220

(c) 210    (d) None of these

24. In the expansion of $\frac{a+bx}{e^x}$,the coefficient of $x^r$ is

(a) $\frac{a-b}{r!}$    (b) $\frac{a-br}{r!}$

(c) $(-1)^r\frac{a-br}{r!}$    (d) None of these

25. If n=(1999) !,then $\sum_{x=1}^{1999}log_n x$ is equal to

(a) 1    (b) 0

(c) $\sqrt[1999]{1999}$    (d) -1

26. P is a fixed point (a,a,a) on a line through the origin equally inclined to the axes,then any plane through P perpendicular to OP, makes intercepts on the axes, the sun of whose reciprocals is equal to

(a) a                       (b) $\dfrac{3}{2a}$

(c) $\dfrac{3a}{2}$            (d) None of these

27. For which of the following values of m,the area of the region bounded by the curve y=x-x² and the line y=mx equals $\dfrac{9}{2}$

        (a) -4   (b) -2   (c) 2   (d) 4

28. If f:R → R be such that f(1) =3 and f'(1) = 6,Then, $\lim\limits_{x \to 0}\left\{\dfrac{f(1)+x}{f(1)}\right\}^{1/x}$ equals to

        (a) 1   (b) $e^{1/2}$   (c) $e^2$   (d) $e^3$

29. If f(x) = $\begin{cases} (1 + |\sin x|)^{a/|\sin x|}, & -\dfrac{\pi}{6} < x < 0 \\ b, & x = 0 \\ e^{\tan 2x/\tan 3x}, & 0 < x < -\dfrac{\pi}{6} \end{cases}$ , The n the value of a and b,if f is continuous at

x=0,are respectively.

        (a) $\dfrac{2}{3},\dfrac{3}{2}$        (b) $\dfrac{2}{3},e^{2/3}$

        (c) $\dfrac{3}{2},e^{3/2}$     (d) None of these

30. The domain of the function f(x) = $\dfrac{1}{\log_{10}(1-x)}+\sqrt{x + 2}$ is

    (a) ]-3, -2,5 [∩] -2.5,-2[

    (b) [-2,0 [∩] 0,1[

    (c) ]o,1[

    (d) None of the above

31. The solution of the differential equation $(1+y^2) + (x-e^{\tan^{-1}y})\dfrac{dy}{dx}=0$, is

    (a) $(x-2) = Ke^{\tan^{-1}y}$

    (b) $2xe^{\tan^{-1}y} = e^{2\tan^{-1}y} + K$

    (c) $xe^{\tan^{-1}y} = \tan^{-1} + K$

    (d) $xe^{2\tan^{-1}y} = e^{\tan^{-1}y} + K$

32. If the gradient of the tangent at any point (x,y) of the curve which passes through the point $\left(1, \frac{\pi}{4}\right)$ is $\left\{\frac{y}{x} - \sin^2\left(\frac{y}{x}\right)\right\}$, then equation of the curve is

(a) $y = \cot^{-1}(\log_e x)$

(b) $y = \cot^{-1}\left(\log_e \frac{x}{e}\right)$

(c) $y = x \cot^{-1}(\log_e ex)$

(d) $y = \cot^{-1}\left(\log_e \frac{e}{x}\right)$

33. The relation R defined on set A = {x : | x | < 3, x ∈ I } by R = {(x,y) : y = | x | } is

(a) {-2,2), (-1,1),(0,0),(1,1),(2,2) }

(b) { (-2, -2),(-2,2),(-1,1),(0,0),(1,-2),(1,2),(2,-1),(2,-2) }

(c) { 90,0)(1,1),(2,2) }

(d) None of the above

34. The solution of the differential equation $\frac{dy}{dx} = \frac{yf'(x) - y^2}{f(x)}$ is

(a) f(x) = y+C     (b) f(x) = y(x+C)

(c) f(x) = x+C     (d) None of the above

35. If a,b and c are in AP, then determinant $\begin{vmatrix} x+2 & x+3 & x+2a \\ x+3 & x+4 & x+2b \\ x+4 & x+5 & x+2c \end{vmatrix}$ is

(a) 0     (b) 1

(c) x     (d) 2x

36. If two events A and B. If odds against A are as 2:1 and those infavour of A ∪ B areas 3:1, then

(a) $\frac{1}{2} \leq P(B)$  $\frac{3}{4}$     (b) $\frac{5}{12} \leq P(B)$  $\frac{3}{4}$

(c) $\frac{1}{4} \leq P(B)$  $\frac{3}{4}$     (d) None of these

37. The value of $2\tan^{-1}(\text{cosec } \tan^{-1} x - \tan \cot^{-1} x)$ is

(a) $\tan^{-1} x$

(b) $\tan x$

(c)  cot x

(d)  cosec$^{-1}$ x

38.  The proposition ~ ( p    q) is equivalent to

(a)  (pv ~q) ∧ (q ∧ ~p)

(b)  (pv ~q) ∨ (q ∧ ~p)

(c)  (p∧ ~q) ∧ (q ∧ ~p)

(d)  None of the above

39.  If truth values of P be F and q be T.Then,truth value of ~(~ p ∨ q) is

(a)  T    (b)  F    (c)  Either T or F    (d)  Neither T not F

40.  The rate of charge of the surface area of a sphere of radius r, when the radius is increasing at the rate of 2 cm/s is proportional to

(a)  $\frac{1}{r}$    (b)  $\frac{1}{r^2}$

(c)  r    (d)  r$^2$

# VITEEE Answer Keys 2013

## Answers

**PHYSICS**

1.(b) 2.(b) 3.(c) 4.(d) 5.(b) 6.(c) 7.(d) 8.(d) 9.(b) 10.(a) 11.(a) 12.(d) 13.(a) 14.(a) 15.(b) 16.(b) 17.(a) 18.(a) 19.(a) 20.(b) 21.(c) 22.(d) 23.(a) 24.(b) 25.(a) 26.(b) 27.(d) 28.(b) 29.(a) 30.(b) 31.(b) 32.(c) 33.(d) 34.(b) 35.(b) 36.(d) 37.(b) 38.(a) 39.(d) 40.(a)

**CHEMISTRY**

1.(d) 2.(c) 3.(c) 4.(a) 5.(b) 6.(a) 7.(d) 8.(a) 9.(c) 10.(b) 11.(d) 12.(d) 13.(c) 14.(b) 15.(a) 16.(b) 17.(c) 18.(d) 19.(a) 20.(a) 21.(d) 22.(b) 23.(c) 24.(b) 25.(c) 26.(b) 27.(a) 28.(c) 29.(b) 30.(d) 31.(c) 32.(b) 33.(a) 34.(a) 35.(d) 36.(c) 37.(d) 38.(c) 39.(d) 40.(b)

**MATHMATICS**

1.(d) 2.(c) 3.(d) 4.(b) 5.(a) 6.(c) 7.(c) 8.(a) 9.(c) 10.(a) 11.(b) 12.(d) 13.(b) 14.(a) 15.(a) 16.(b) 17.(c) 18.(a) 19.(c) 20.(d) 21.(d) 22.(d) 23.(a) 24.(c) 25.(a) 26.(b) 27.(b) 28.(c) 29.(b) 30.(d) 31.(b) 32.(c) 33.(a) 34.(b)35.(a) 36.(b) 37.(a) 38.(b) 39.(b) 40.(c)