VITEEE Physics 2012

1. The potential of the electric field produced by point charge at any (x,y,z) is given by $V=3x^2+5$, where x,y are in meters and V is in volts. The intensity of the electric field at (-2,1,0), is

(a) $+17\ Vm^{-1}$ (b) $-17\ Vm^{-1}$

(c) $+12\ Vm^{-1}$ (d) $-12\ Vm^{-1}$

2. The potential of a large liquid drop when eight liquid drops are combined is 20 V. Then the potential of each single drop was

(a) 10 V (b) 7.5 V

(c) 5 V (d) 2.5 V

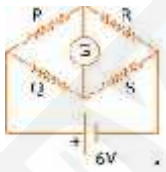
3. A and B are two metals with threshold frequencies $1.8x10^{14}$ Hz. Two identical photons of energy 0.825 eV each are incident on them. Then photoelectrons are emitted by

(Take $h = 6.6x10^{-34}$ J-s)

(a) B-alone (b) A alone

(c) Neither A nor B (d) Both A and B

4. In the Wheatstone's network given, P=10Ω, Q=20Ω, R=15Ω, S=30Ω, the current passing through the battery (of negligible internal resistance) is



(a) 0.36 A
(b) Zero
(c) 0.18 A
(d) 0.72 A

5. Three resistors 1Ω,2Ω and 3Ω are connected to form a triangle. Across 3Ω resistor a 3 V battery is connected. The current through 3Ω resistor is

(a) 0.75 A (b) 1 A

(b) 2 A (d) 1.5 A

6. In a common emitter the input signal is applied across

(a) anywhere (b) emitter-collector

(c) collector-base (d) base-emitter

7. The kinetic energy of an electron get tripled then the de-Broglie wavelength associated with it changes by a factor

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

8. A radioactive substance contains 10000 nuclei and its half-life period is 20 days. The number of nuclei present at the end of 10 days is

(a) 7070 (b) 9000

(c) 8000 (d) 7500

9. A direct X-ray photograph of the intensities is not generally taken by radiologists because

(a) intensities would burst an exposure to X-rays

(b) The X-rays would be not pass through the intenstines

(c) The x-rays will pass through the intenstines without causing a good shadow for any useful diagnosis

(d) A very small exposure of X-rays causes in the in the intenstines

10. Charge passing through a conductor of cross-section area A=0.3 m^2 is given by $q=3t^2+5t+2$ in coulomb , where t is in second . What is the value of drift velocity at t=2 s? (Given, $n=2x10^{25}/m^3$)

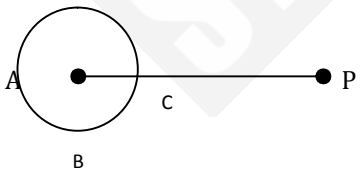
(a) $0.77x10^{-5}$ m/s (b) $1.77x10^{-5}$ m/s

(c) $2.08x10^{-5}$ m/s (d) $0.57x10^{-5}$ m/s

11. Two capacitors of capacities 1 μF and C μF are connected in series and the combination is 80 μC, the energy stored in the capacitor of capacity C in μJ is

(a) 1800 (b) 1600 (c) 14400 (d) 7200

12. A hollow conducting sphere is placed in an electric field produced by a point charge placed at p as shown in figure. Let V_A,V_B,V_C be the potentials at points A,B and C respectively. Then



(a) $V_C>V_B$ (b) $V_B>V_C$

(c) $V_A>V_B$ (d) $V_A=V_C$

13. In a hydrogen discharged tube it is observed that through given cross-section $3.13x10^{15}$ electrons are moving from right to left and $3.12x10^{15}$ protons are moving from left to right. What is is the electric current in the discharged tube and what is its direction?

(a) 1 mA towards right

(b) 1 mA towards left

(c) 2 mA towards left

(d) 2 mA towards right

14. In $CuSO_4$ solution when electric current equal to 2.5 faraday is passed, the gm equivalent deposited on the cathode is

(a) 1 (b) 1.5 (c) 2 (d) 2.5

15. In hydrogen a atom, an electric is revolving in the orbit of radius 0.53 $\dot{A}$ with $6.6x10^{15}$ radiations/s. Magnetic field produced at the centre of the orbit is

(a) 0.125 Wb/m^2 (b) 1.25 Wb/m^2

(c) 12.5 Wb/m^2 (d) 125 Wb/m^2

16. The dipole moment of a short bar magnet is 12.5 $A\text{-}m^2$. The magnetic field on its axis at a distance of the magnet is

(a) $1.0x10^{-4}$ N/A-m

(b) $4x10^{-2}$ N/A-m

(c) $2x10^{-6}$ N/A-m

(d) $6.64x10^{-8}$ N/A-m

17. The turnratio of a transformers is given as 2:3. If the current through the primary coil is 3 A, thus calculate the current through load resistance

(a) 1 A (b) 4.5 A (c) 2 A (d) 1.5 A

18. In an AC circuit, the potential across an inductance and resistance joined in series are respectively 16 V and 20 V. The total potential difference potential difference across the circuit is

(a) 20.0 V (b) 25.6 V

(c) 31.9 V (d) 33.6 V

19. If hydrogen atom is its ground state absorbs 10.2 eV of energy. The orbital angular momentum is increased by

(a) $1.05x10^{34}$ J/s

(b) $3.16x10^{-34}$ J/s

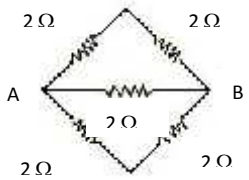
(d) $2.11x10^{-34}$ J/s

(d) $4.22x10^{-34}$ J/s

20. Highly energetic electrons re bombarded on a target of an element containing 30 neutrons. Theratio of radii of nucleus to that of Helium nucleus is $(14)^{1/3}$. The atomic number of nucleus will be

(a) 25 (b) 26 (c) 56 (d) 30

21. Each resistance shown in figure is 2 Ω. Thhe equivalent resistance between A and B is



(a) 2 Ω (b) 4 Ω (c) 8 Ω (d) 1 Ω

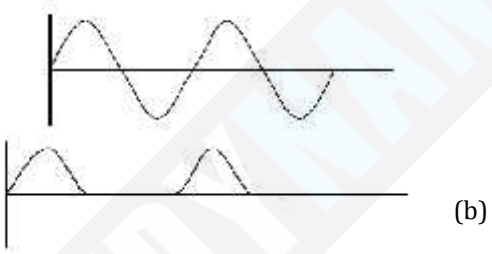
22. If in triode value amplification factor is 20 and plate resistance is 10 kΩ, then its mutual conductance is

(a) 2 milli mho (b) 20 milli mho

(c) (1/2) milli mho (d) 200-mho

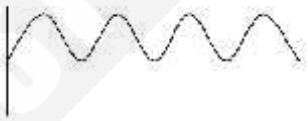
23. The output wave form of full wave rectifier is

(a)



(b)

(c)



(d)

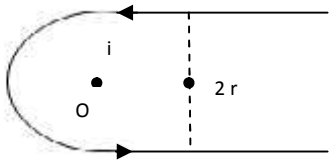
24. Calculate the energy released when three α-particles combined to form a ^{12}C nucleus, the mass defeat is

(Atomic mass of $_2He^4$ is 4.002603 u)

(a) 0.007809 u (b) 0.002603

(c) 4.002603 u (d) 0.5 u

25. In the figure shown, the magnetic field induction at the point O will be



(a) $\frac{\mu_0 I}{2\pi r}$ (b) $\left(\frac{\mu_0}{4\pi}\right)\left(\frac{I}{r}\right)(\pi+2)$

(c) $\left(\frac{\mu_0}{4\pi}\right)\left(\frac{I}{r}\right)(\pi+1)$ (d) $\frac{\mu_0 I}{2\pi r}(\pi-2)$

26. In photoelectric emission process from a metal of work function 1.8 eV, the kinetic energy of most energetic electrons is 0.5 eV. The corresponding stopping potential is

(a) 1.3 V (b) 0.5 V (c) 2.3 V (d) 1.8 V

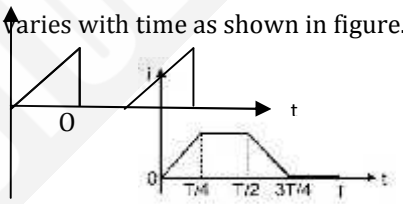
27. A current of 2 A flows a 2Ω resistor when connected across a battery. The same battery supplies a current of 0.5 A when connected across a 9Ω resistor. The internal resistance of the battery is

(a) 1/3 Ω (b) ¼ Ω

(c) 1 Ω (d) 0.5 Ω

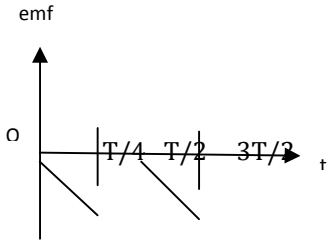
28. The current I in a coil varies with time as shown in figure. The variation of induced emf with time would be

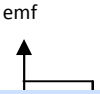
(a)



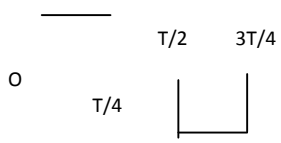
O T/4 T/2 3T/2

(b)

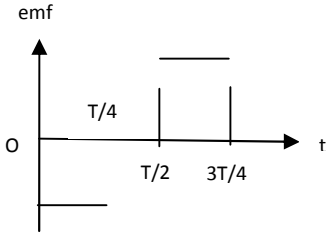




(c)



(d)



29. A transistor is operated in common emitter configuration at $V_c = 2$ V such that a change in the base current from 100 μA to 300 μA produces a change in the collector current from 10 mA. The current gain is

(a) 75 (b) 100 (c) 25 (d) 50

30. A uniform electric field and a uniform magnetic field are acting along the same direction in a certain region. If an electron is projected in the region such that its velocity is printed along the direction of fields, then the electron

(a) speed will decrease (b) speed will increase

(c) will turn towards left of direction of motion

(d) will turn towards right of direction a motion

31. Change q is uniformly spread on a thin ring of radius R. The ring rotates about its axis with a uniform frequency f Hz. The magnitude of magnetic induction at the centre of the ring is

(a) $\frac{\mu_0 q f}{2R}$ (b) $\frac{\mu_0 q}{2 f R}$

(c) $\frac{\mu_0 q}{2\pi f R}$ (d) $\frac{\mu_0 q f}{2\pi R}$

32. A galvanometer of resistance, G is shunted by a resistance S ohm. To keep the main current in the circuit unchanged, the resistance to be put in series with galvanometer is

(a) $\frac{S^2}{(S+G)}$ (b) $\frac{SG}{(S+G)}$

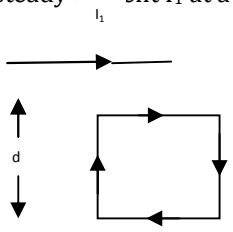
(c) $\frac{G^2}{(S+G)}$ (d) $\frac{G}{(S+G)}$

33. Three charges, each +q, are placed at the corners of an isosceles triangle ABC of sides BC and AC, 2a. D and E are the mid-points of BC and CA. The work done in taking a charge Q from D to E is

(a) $\frac{eqQ}{8\pi\varepsilon_0 a}$ (b) $\frac{qQ}{8\pi\varepsilon_0 a}$

(c) Zero (d) $\frac{3qQ}{8\pi\varepsilon_0 a}$

34. A square loop, carrying a steady current I, is placed in horizontal plane near a long straight conductor carrying a steady current I_1 at a distance d from the conductor as shown in figure. The loop will experience

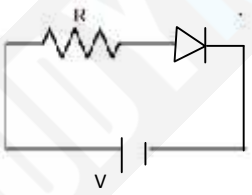


(a) A net repulsive force away from the conductor
(b) A net torque acting upward perpendicular to the horizontal plane
(c) A net torque acting downward normal to the horizontal plane
(d) A net attractive force towards the conductor

35. The threshold frequency for a photo-sensitive metal is 3.3×10^{14} Hz. If light of frequency 8.2×10^{14} Hz is incident on this metal, the cut off voltage for the photo-electric emission is nearly

(a) 2 V (b) 3 V (c) 5 V (d) 1 V

36. For the given circuit of p-n junction diode, which of the following statement is correct



(a) In forward biasing the voltage across R is V
(b) In forward biasing the voltage across R is 2 V
(c) In reverse biasing the voltage across R is V
(d) In reverse biasing the voltage across R is 2 V

37. If the binding energy per nuclear in Li^7 and He^4 nuclei are respectively 5.60 MeV and 7.06 MeV, then energy of reactor

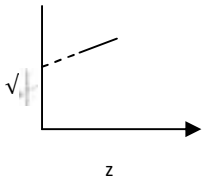
$Li^7 + P \rightarrow 2\ {}_2He^4$ is

(a) 19.6 MeV (b) 2.4 MeV

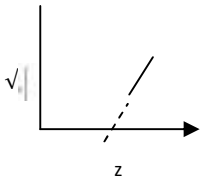
(c) 8.4 MeV (d) 17.3 MeV

38. The graph between the square root of the frequency of a specific line of characteristic spectrum of X-ray and the atomic number of the target will be

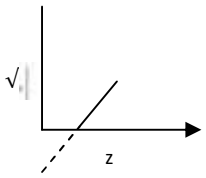
(a)



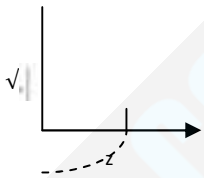
(b)



(c)



(d)



39. A resistor R, an inductor L and capacitor C are connected in series to an osciller of frequency n. If the resonant frequency is n_r, then the current lags behind voltage, when

(a) $n=0$ (b) $n<n_r$

(c) $n=n_r$ (d) $n>n_r$

40. A parallel plate capacitor ha scapacitance C. If it is equally filled with parallel layers of materials of dielectric constant K_1 and K_2 its capacity becomes C_1. The ratio of C_1 and C is

(a) K_1+K_2

(b) $\frac{K_1K_2}{K_1+K_2}$

(c) $\frac{K_1+K_2}{K_1K_2}$

(d) $\frac{2K_1K_2}{K_1+K_2}$

VITEEE Chemistry 2012

1. Among the elements Ca, Mg, P and Cl, the order of increasing atomic radii is

(a) Mg<Ca<Cl<P (b) Cl<P<Mg<Ca

(b) P<CL<Ca<Mg (d) Ca<Mg<P<Cl

2. The reaction,

$2A(g)+B(g) \rightleftharpoons 3C(g)+D(g)$ is begun with the concentrations of A and B both at an initial value of 1.00 M. When equilibrium is reached, the concentration of D is measured and found to be 0.25 M. The value for the equilibrium conatant for this reaction is given by the expression

(a) $[(0.75)^3 (0.25)] / [(1.00)^2 (0.75)]$
(b) $[(0.75)^3 (0.25)] / [(0.50)^2 (0.75)]$
(c) $[(0.75)^3 (0.25)] / [(0.50)^2 (0.25)]$
(d) $[(0.75)^3 (0.25)] / [(0.75)^2 (0.25)]$

3. Which of the following expressions correctly represent the equivalent conductance at infinite dilution of $Al_2(SO_4)_3$? Given that $i_{Al^{3+}}^0$ and $i_{SO_4^{2-}}^0$ are the equivalent conductances at infinite dilution of the respective ions?

(a) $2 i_{Al^{3+}}^0 + 3 i_{SO_4^{2-}}^0$

(b) $i_{Al^{3+}}^0 + i_{SO_4^{2-}}^0$

(c) $(\Lambda_{Al^{3+}}^0 + 3\Lambda_{SO_4^{2-}}^0) \times 6$

(d) $\frac{1}{3}\Lambda_{Al^{3+}}^0 + \frac{1}{2}\Lambda_{SO_4^{2-}}^0$

4. The pressure exerted by 6.0g of methane gas in a 0.03 m^3 vessel at 129^0C is (Atomic masses: C = 12.01, H = 1.01 and R = 8.314 JK^{-1} mol^{-1})

(a) 215216 Pa (b) 13409 Pa

(c) 41648 Pa (d) 31684 Pa

5. Match List I (Equations) with List II (Types of process) and select the correct option.

	List I (Equations)		List II (Types of process)
A.	$K_p > Q$	1.	Non-spontaneous
B.	$\Delta G^o < RT \ln Q$	2.	Equilibrium
C.	$K_p = Q$	3.	Spontaneous and
D.	$T > \frac{\Delta H}{\Delta S}$	4.	endothermic
			Spontaneous

A B C D

(a) 1 2 3 4
(b) 3 4 2 1

(c) 4 1 2 3
(d) 2 1 4 3

6. Among the following which one has the highest cation of anion size ratio?

(a) CsI (b) CsF

(c) LiF (d) NaF

7. Which of the following species is not electrophilic in nature?

(a) $\overset{\oplus}{Cl}$ (b) BH_3

(c) $\overset{\oplus}{H_3O}$ (d) $\overset{\oplus}{NO_2}$

8. Match List I (Substances) with List II (Processes employed in the manufacture of the substances) and select the correct option.

	List I (Substances)		List II (Processes)
A.	Sulphuric acid	1.	Haber's process
B.	Steel	2.	Bessemer's process
C.	Sodium hydroxide	3.	Leblanc process
D.	Ammonia	4.	Contact process

Codes

	A	B	C	D
(a)	1	4	2	3
(b)	1	2	3	4
(c)	4	3	2	1
(d)	4	2	3	1

9. When glycerol is treated with excess of HI, it produces

(a) 2-iodopropane (b) allyl iodide

(c) propene (d) glycerol triiodide

10. Some statements about heavy water are given below.

(i) Heavy water is used as moderator in nuclear reactors

(ii) Heavy water is more associated than ordinary water

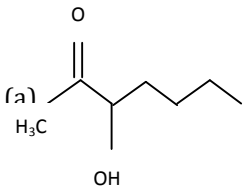
(iii) Heavy water is more effective solvent than ordinary water

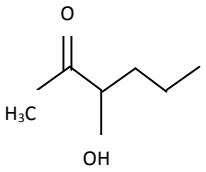
Which o-f the above statements are correct?

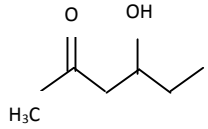
(a) (i) and (ii) (b) (i),(ii) and (iii)

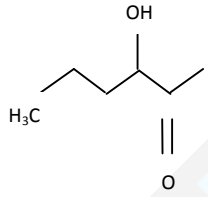
(c) (ii) and (iii) (d) (i) and (iii)

11. Which of the following compounds will be most readily dyhydrated?

(a) 

(b) 

(c) 

(d) 

12. Which one of the following complexes is not expected to exhibit isomerism?

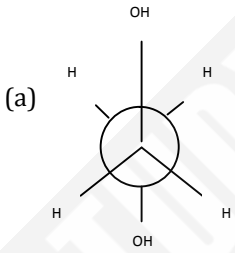
(a) $[(Ni(NH_3)_4(H_2O)_2]^{2+}$

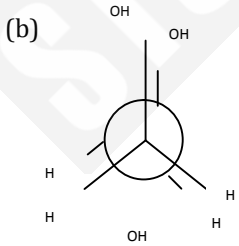
(b) $[Pt(NH_3)_2Cl_2]$

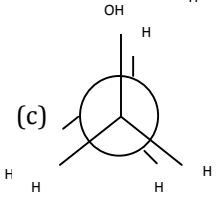
(c) $[Ni(NH_3)_2Cl_2]$

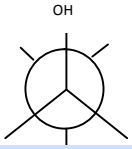
(d) $[Ni(en)_2]^{2+}$

13. Which of thke following conformers for ethylene glycol is most stable?

(a) 

(b) 

(c) 



(d)

14. The IUPAC name of the compound $CH_3CH = CHC \equiv CH$ is

(a) pent-4-yn-2-ene

(b) pent-3-en-1-yne

(c) pent-2-en-4-yne

(d) pent-1-yn-3-ene

15. Which of the following oxidation states is the most common among the lanthanoids?

(a) 4 (b) 2 (c) 5 (d) 3

16. Some of the properties of the two species, NO_3^- and H_3O^+ are described below. Which one of them is correct?

(a) Dissimilar in hybridsation for the central atom with different structures

(b) Isostructural with same hybridization for the central atom

(c) Isostructural with same hybridization for the central atom

(d) Similar in hybridization for the central atom with different structures

17. Following compound are given

(i) CH_3CH_2OH

(ii) CH_3COCH_3

(iii) CH_3 –CHOH
|
CH_3

(iv) CH_3OH

Which of the above compound (s) on being warmed with indine solution and NaOH, will give iodoform?

(a) (i), (III) and (iV) (b) Only (ii)

(c) (i), (ii) and (iii) (d) (i) and (ii)

18. Fructose reduces Tollen's reagent due to

(a) asymmetric carbons

(ii) primary alcoholic group

(iii) secondary alcoholic group

(iv) enolisation of fructose followed by conversion to aldehyde by base

19. In the following reaction,

$$C_6H_5C\text{[illegible]} \xrightarrow[(ii)\ H_3O^+]{(i)\ Mg,\ Ether} X,$$

The product 'X' is

(a) $C_6H_5CH_2OCH_2C_6H_5$
(b) $C_6H_5CH_2OH_2$
(c) $C_6H_5CH_3$
(d) $C_6H_5CH_2\ CH_3\ C_6H_5$

20. Which of the following is not a fat soluble vitamin?

(a) Vitamin – B complex

(b) Vitamin-D

(c) Vitamin – E

(d) Vitamin – A

21. Which of the statements about 'Denaturation' given below are correct?

(i) Denaturation of proteins cause loss of secondary and tertiary structures of the protein

(ii) Denaturation 'eads to the conversion of double stand of DNA into signal stand.

(iii) Denaturation affects primary structure which gets destroyed.

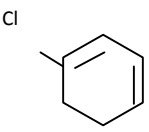
(a) (ii) and (iii)
(b) (i) and (iii)
(c) (i) and (ii)
(d) (i) ,(ii) and (iii)

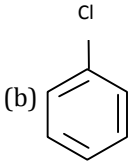
22. Which of the maximum number of molecules among the following?

(a) 44 g CO_2 (b) 48 g O_3

(c) 8 g H_2 (d) 64 g SO_2

23. Which of the following compounds undergoes nucleophilic substitution reaction most easily

(a) 

(b) 

(c) (d)

24. A 0.1bmolal aqueous solution of a week acid is 30% ionized. If K_f for water is 1.86^0 C/m, the freezing point of the solution will be

(a) -0.18^0C (b) -0.54^0C

(c) -0.36^0C (d) -0.24^0C

25. Which of the following carbonyls will have the strongest C – O bond?

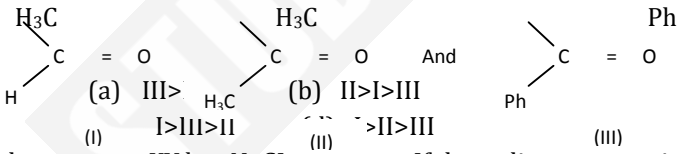
(a) $Mn(CO)^+_6$

(b) $Cr(CO)_6$

(c) $V(CO)^-_6$

(d) $Fe(CO)_5$

26. The order of reactivity of phenyl magnesium (PhMgBr) with the following Compounds



(a) III> I>III>II (b) II>I>III >II>III

27. A solid compound XY has NaCL structure. If the radius of the cation is 100 pm, the radius of the amion (Y^-) will be

(a) 275.1 pm (b) 322.5 pm

(c) 241.5 pm (d) 165.7 pm

28. Consider the following processes ΔH (Kj/mol)

$\frac{1}{2}A \rightarrow$ B+150

$3B \rightarrow$ 2C + D -125

$E+A \rightarrow$ 2D +350

B+D E + 2C, ΔH will be

(a) 525 KJ/mol (b) -175 KJ/mol

(c) -325 KJ/mol (d) 325 KJ/mol

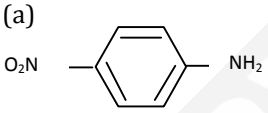
29. Match the compounds given in list I with List II and select the suitable option using the codes given below.

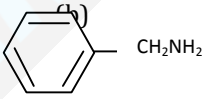
	List I		List II
A.	Benzaldehyde	1.	Phenolphthalein
B.	Phthalic anhydride	2.	Benzoin condensation
C.	Phenyl benzoate	3.	Oil of wintergreen
D.	Methyl; salicylate	4.	Fries rearrengement

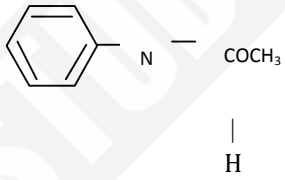
Codes

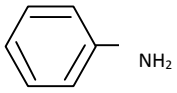
	A	B	C	D
(a)	4	1	3	2
(b)	4	2	3	1
(c)	2	3	4	1
(d)	2	1	4	3

30. Which of the following compounds is the most basic?

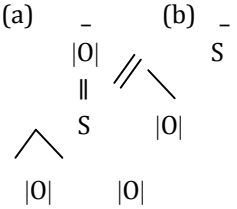
(a) 

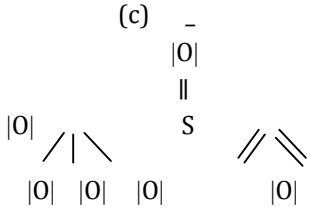
(b) 

(c) 

(d) 

31. Which of the following structures in the most preferred and hence of lower energy for SO_3 and hence of lowest energy for SO_3?

(a) 

(b) 

(c)

(d)

32. What is the value of electron gain enthalpy of Na^+ if IE_1 of Na = 5.1 eV?

(a) -5.1 eV (b) -10.2 eV

(c) +2.55 eV (d) +10.2 eV

33. The unit of rate constant for a zero order reaction is

(a) mol L^{-1} s^{-1} (b) L mol^{-1} s^{-1}

(c) L^2mol^{-2} s^{-1} (d) s^{-1}

34. A bubble of air is underwater at temperature 15^0C and the pressure 1.5 bar. If the mbubble rises to the surface where the temperature is 25^0C and the pressure is 1.0 bar, What will happen to the volume of the bubble?

(a) Volume will become greater by a factor of 1.6

(b) Volume will become greater by a factor of 1.1

(c) Volume will become smaller by a factor of 0.70

(d) Volume will become greater by a factor of 2.9

35. Match List I with List II for theh compositions of substances and select the correct answer using the codes given below the lists.

	List I (Substances)		List II (Composition)
A.	Plaster of Paris	1.	$CaSO_4 . \overline{2H_2}O$
B.	Epsomite	2.	$CaSO_4 . \frac{1}{2} H_2O$
C.	Kieserite	3.	$MgSO_4 . 7 H_2O$
D.	Gypsum	4.	H_2O
		5.	$CaSO_4$

Codes

	A	B	C	D
(a)	3	4	1	2
(b)	2	3	4	1
(c)	1	2	3	5
(d)	4	3	2	1

36. The pairs of species of oxygen and their magnetic behaviours are noted below. Which of the following present the correct description?

(a) O^-_2 , O^{2-}_2 – Both diamagnetic
(b) O^+ , O^{2-}_2 – Both paramagnetic
(c) O^+_2 , O_2 – Both paramagnetic
(d) O, O^{2-}_2 - Both paramagnetic

37. Consider the reactions

(i) $(CH_3)_2CH - CH_2Br \xrightarrow{C_2H_5OH} (CH_3)_2CH - CH_2OC_2H_5 + HBr$

(ii) $(CH_3)_2CH - CH_2Br \xrightarrow{C_2H_5O^-} (CH_3)_2CH - CH_2OC_2H_5 + Br^-$

The mechanisms of reactions (i) and (ii) are respectively

(a) S_N1 and S_N2
(b) S_N1 and S_N1
(c) S_N2 and S_N2
(d) S_N2 and S_N1

38. Which of the following complex compounds will exhibit highest paramagnetic behavior?

(At. No. Ti = 22, Cr = 24, Co = 27, Zn = 30)

(a) $[Ti(NH_3)_6]^{3+}$
(b) $[Cr(NH_3)_6]^{3+}$
(c) $[Co(NH_3)_6]^{3+}$
(d) $[Zn(NH_3)_6]^{3+}$

39. Which of the following oxide is amphoteric?

(a) SnO_2

(b) CaO

(c) SiO_2

(d) CO_2

40. The following reactions take place in the blast furanace in the preparation of impure iron. Identify the reaction pertaining to the formation of the slag.

(a) $Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(l)$

(b) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

(c) $CaO(s) + SiO_2(s) \rightarrow CaSiO_3(s)$

(d) $2C(s) + O_2(g) \rightarrow 2CO(g)$

VITEEE Mathematics 2012

1. The function f:R → R defined by f(x) = (x-1) (x-2) (x-3)is

   (a) one-one but not onto

   (b) onto but not one-one

   (c) both one-one and onto

   (d) neither one-one nor onto

2. If the complex numbers z_1,z_2 and z_3 are in AP, then they lie on a

   (a) a circle (b) a parabola

   (c) line (d) ellipse

3. Let a,b and c be in AP and | a | < 1, | b | < 1, | c | < 1. If $x=1+a+a^2+\ldots$ to ∞,

   $Y= 1+b+b^2+\ldots$ to ∞,

   $Z= 1+c+c^2+\ldots$ to ∞, then x,y and z are in

   (a) AP (b) GP

   (c) HP (d) None of these

4. The number of real solutions of the equation $\left(\frac{9}{10}\right) = -3+x-x^2$ is

   (a) 0 (b) 1

   (c) 2 (d) None of these

5. The lines 2x-3y-5 = 0 and 3x-4y = 7 are diameters of a circle of area 154 sq units, then the equation of the circle is

   (a) $x^2+y^2+2x-2y-62 = 0$

   (b) $x^2+y^2+2x-2y-47 = 0$

   (c) $x^2+y^2+2x+2y-47 = 0$

   (d) $x^2+y^2+2x+2y-62 = 0$

6. The angle of depressions of the top and the foot of a chimney as seen from the top of a second chimney, which is 150 m high and standing on the same level as the first are θ and ϕ respectively, then the distance between their tops when $\tan\theta = = \frac{4}{3}$ and $\tan\phi = \frac{5}{2}$ is

(a) $\frac{150}{\sqrt{3}}$ m (b) $100\sqrt{3}$ m

(c) 150 m (d) 100 m

7. If one root is square of the other root of the equation $x^2+px+q = 0$, then the relations between p and q is

(a) $p^3-(3p-1)q+q^2 = 0$

(b) $p^3-q(3p+1)+q^2=0$

(c) $p^3+q(3p-1)+q^2 = 0$

(d) $p^3+q(3p+1)+q^2 = 0$

8. The coefficient of x^{53} in the following expansions $\sum_{m=0}^{100} 100_{C_m} (x-3)^{100-m} . 2^m$ is

(a) $100_{C_{47}}$ (b) $100_{C_{53}}$

(c) $-100_{C_{53}}$ (d) $-100_{C_{100}}$

9. if (-3,2) lies on the circle $x^2+y^2+2gx+2fy+c = 0$, which is concentric with the circle $x^2+y^2+6x+8y-5 = 0$, then c is equal to

(a) 11 (b) -11 (c) 24 (d) 100

10. If a=i+j+k, b=i+3j+5k and c=7i+9j+11k, then the area of parallelogram having diagonals a+b and b+c is

(a) $4\sqrt{6}$ (b) $\frac{1}{2}\sqrt{21}$ sq units

(c) $\frac{\sqrt{6}}{2}$ (d) $\sqrt{6}$ sq units

11. If A = $\begin{bmatrix} 1 & -5 & 7 \\ 0 & 7 & 9 \\ 11 & 8 & 9 \end{bmatrix}$, then trace of matrix A is

(a) 17 (b) 25 (c) 3 (d) 12

12. The value of the determinant $\begin{vmatrix} \cos\alpha & -\sin\alpha & 1 \\ \sin\alpha & \cos\alpha & 1 \\ \cos(\alpha+\beta) & -\sin(\alpha+\beta) & 1 \end{vmatrix}$ is

(a) independent of α

(b) independent of β

(c) independent of α and β

(d) None of the above

13. The maximum value of $4\sin^2 x - 12 \sin x + 7$ is

(a) 25 (b) 4 (c) does not exist (d) None of these

14. A straight line through the point A(3,4) is bisected at A. Its equation is

(a) 3x-4y+7=0 (b) 4x+3y=24

(c) 3x+4y=25 (d) x+y=7

15. The tangent at (1,7) to the curve $x^2 = y-6$ touches the circle $x^2+y^2+16x+12y+c = 0$ at

(a) (6,7) (b) (-6,7)

(c) (6,-7) (d) (-6,-7)

16. The equation of straight line through the intersection of the lines x-2y =1 and x+3y=2 and parallel to 3x+4y=0 is

(a) 3x+4y+5=0

(b) 3x+4y-10=0

(c) 3x+4y-5=0

(d) 3x+4y+6=0

17. $\int \frac{dx}{\sin x - \cos x + \sqrt{2}}$ equals to

(a) $-\frac{1}{\sqrt{2}} \tan\left(\frac{x}{2} + \frac{\pi}{2}\right) + C$

(b) $\frac{1}{2} \tan\left(\frac{x}{2} + \frac{\pi}{2}\right) + C$

(c) $\frac{1}{\sqrt{2}} \cot\left(\frac{x}{2} + \frac{\pi}{2}\right) + C$

(d) $-\frac{1}{\sqrt{2}} \cot\left(\frac{x}{2} + \frac{\pi}{2}\right) + C$

18. The value of integral $\int_0^1 \sqrt{\frac{1-x}{1+x}}\, dx$ is

(a) $\frac{\pi}{2} + 1$ (b) $\frac{\pi}{2} - 1$

(c) -1 (d) 1

19. The value $I = \int_0^1 x \left|x - \frac{1}{2}\right| dx$ is

(a) $\frac{1}{3}$ (b) $\frac{1}{4}$

(c) $\frac{1}{8}$ (d) None of these

20. The eccentricity of the ellipse, which meets the straight line $\frac{x}{7}+\frac{y}{2}=1$ on the axis of y and whose axes lie along the axes of coordinates, is

(a) $\frac{3\sqrt{2}}{7}$ (b) $\frac{2\sqrt{6}}{7}$

(c) $\frac{\sqrt{3}}{7}$ (d) None of the above

21. If $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ (a>b) and $x^2-y^2 = c^2$ cut at right angles, then

(a) $a^2+b^2 = 2c^2$

(b) $b^2-a^2 = 2c^2$

(c) $a^2-b^2= 2c^2$

(d) $a^2b^2 =2c^2$

22. The equation of the conic with focus at (1,-1) directrix along x-y+1 = 0 and with eccentricity $\sqrt{2}$, is

(a) $x^2-y^2 = 1$ (b) $xy =1$

(c) $2xy-4x+4y+1 = 0$

(d) $2xy+4x-4y-1 =0$

23. There are 5 letters and 5 different envelopes. The number of ways in which all the letters can be put in wrong envelope, is

(a) 119 (b) 44 (b) 59 (d) 40

24. The sum of the series $1+\frac{1^2+2^2}{2!}+\frac{1^2+2^2+3^2}{3!}$

$+\frac{1^2+2^2+3^2+4^2}{4!}+\ldots$is

(a) 3e (b) $\frac{17}{6}$e

(c) $\frac{13}{6}$e (d) $\frac{19}{6}$e

25. The coefficient of x^n in the expansion of $\log_a(1+x)$ is

(a) $\frac{(-1)^{n-1}}{n}$ (b) $\frac{(-1)^{n-1}}{n}\log_a e$

(c) $\frac{(-1)^{n-1}}{n}\log_a a$ (d) $\frac{(-1)^{n}}{n}\log_a e$

26. If a plane meets the coordinate axes at A,B ankd C in such a way that the centroid of ΔABC is at the point (1,2,3), then equation of the plane is

(a) $\frac{x}{1}+\frac{y}{2}+\frac{z}{3}=1$ (b) $\frac{x}{3}+\frac{y}{6}+\frac{z}{9}=1$

(c) $\frac{x}{1}+\frac{y}{2}+\frac{z}{3}=\frac{1}{3}$ (d) None of these

27. Area lying in the first quadrant and bounded by the circle $x^2+y^2=4$, the line $x=\sqrt{3}y$ and x-axis is

(a) π sq units (b) $\frac{\pi}{2}$ sq units

(c) $\frac{\pi}{3}$ sq units (d) None of these

28. The value of $\lim_{x\to\infty}\left(\frac{\pi}{2}-tan^{-1}x\right)^{1/x}$ is

(a) 0 (b) 1 (c) -1 (d) e

29. If $f(x)=\begin{cases} mx+1, & x\le\frac{\pi}{2} \\ \sin x+n, & x\le\frac{\pi}{2}\end{cases}$ is continuous at $x=\frac{\pi}{2}$, then

(a) m=1,n=0 (b) $m=\frac{n\pi}{2}+1$

(c) $n=m\frac{\pi}{2}$ (d) $m=n=\frac{\pi}{2}$

30. The domain of the function $f(x)=\frac{\sqrt{4-x^2}}{sin^{-1}(2-x)}$ is

(a) [0,2] (b) [0,2]

(c) [1,2] (d) [1,2]

31. The general solution of the differential equation $(1+y^2)dx+(1+x^2)dy=0$ is

(a) x-y = C (1-xy) (b) x-y = C (1+xy)

(c) x+y = C (1-xy) (d) x+y = C (1+xy)

32. The order and degree of the differential equation $\rho=\frac{\left[1+\left(\frac{dy}{dx}\right)^2\right]^{3/2}}{\frac{d^2y}{dx^2}}$ are respectively

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

33. The relation R defined on the set of natural numbers as {(a,b) : a differes from b by 3} is given

(a) { (1,4), (2,5), (3,6), …}

(b) { (4,1), (5,2), (6,3), …}

(c) { (1,3), (2,6), (3,9), …}

(d) None of the above

34. The solution of the differential equation $\frac{dy}{dx}+\frac{2yx}{1+x^2}=\frac{1}{(1+x^2)^2}$ is

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

(b) $\frac{y}{1+x^2} = C+\tan^{-1} x$

(c) $y \log (1+x^2) = C+\tan^{-1} x$

(d) $y(1+x^2) = C+\sin^{-1} x$

35. If x,y and z are all distinct and $\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^2 \\ z & z^2 & 1+z^3 \end{vmatrix} =)$, then the value of xyz is

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

36. The probability that atleast one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then $P(\bar{A}) + P(\bar{B})$ is

(a) 0.4 (b) 0.8

(c) 1.2 (d) 1.4

37. If 3p and 4p are resultant of a force 5p, then angle between 3p and 5p is

(a) $\sin^{-1}\left(\frac{3}{5}\right)$ (b) $\sin^{-1}\left(\frac{4}{5}\right)$

(c) 90^0 (d) None of these

38. If $2\tan^{-1}(\cos x) = \tan^{-1}(2 \operatorname{cosec} x)$, then the value of x is

(a) $\frac{3\pi}{4}$ (b) $\frac{\pi}{4}$

(c) $\frac{\pi}{3}$ (d) None of these

39. Let a be any element in a Boolean algebra B. If a+x =1 and ax=0, then

(a) x=1 (b) x=0

(c) x=a (d) x=a’

40. Dual of (x+y).(x+) = x+x . y+y is

(a) (x.y) + (x.0) = x.(x+y).y

(b) (x+y) + (x.1) = x.(x+y).y

(c) (x.y) (x.0) = x.(x+y).y

(d) None of the above

VITEEE Answer Keys 2012

PHYSICS

1.(d) 2.(c) 3.(b) 4.(a) 5.(b) 6.(b) 7.(c) 8.(a) 9.(c) 10.(b) 11.(b) 12.(d) 13.(a) 14.(a) 15.(c) 16.(c) 17.(c) 18.9b) 19.(a) 20.(b) 21.(a) 22.(a) 23.(c) 24.(a) 25.(b) 26.(b) 27.(a) 28.(d) 29.(d) 30.(a) 31.(a) 32.(c) 33.(c) 34.(d) 35.(a) 36.(a) 37.(d) 38.(b) 39.(d) 40.(d)

CHEMISTRY

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

MATHMATICS

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