

## **BRAINWARE UNIVERSITY**

## **Term End Examination 2021 - 22**

## Programme – Bachelor of Technology in Electronics & Communication Engineering

**Course Name – Chemistry** 

Course Code - BSC(ECE)202

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( Semester II )				
Гime allotted : 1 Hrs.25 Min.		Full Marks : 70		
[The figure in the r	nargin indicates full marks.]			
	Group-A			
(Multiple Choice Type Question)		1 x 70=70		
Choose the correct alternative from the following.	;			
(1) In gauche form of n- butane two methyl groups	are at angle			
a) 55°	b) 60°			
c) 45°	d) 75°			
(2) When the molecule is called optically active?				
a) If it has plane of symmetry	b) If it exhibits enantiomerism			
c) If it exhibits diasteroisomerism	d) If it has centre of symmetry			
(3) What is the axis of symmetry present in water in	molecule?			
a) C <sub>2</sub>	b) C <sub>3</sub>			
c) C <sub>4</sub>	d) C <sub>6</sub>			
(4) What is formed by reaction of ammonia with for	ormaldehyde?			
a) Hexamethylenediamine	b) Adipic acid			
c) Urotrophine	d) Aldol			
(5) SN1 reaction proceeds through the formation o	f			
a) Camban madicala	h) Carbonation			

a) Carbon radicals

b) Carbocation

c) Carbanion

d) Carbene

(6) The human body is an example of a

a) Open system

b) Closed system

c) Isolated system

d) Homogenous system

(7) In an isothermal expansion of an ideal gas which of the following is true?

a)  $\Delta S=0$ 

b)  $\Delta V=0$ 

c)  $\Delta q=0$ 

d)  $\Delta T=0$ 

(8) In an adiabatic process which of the following is true?

a)  $\Delta q=0$ 

b)  $\Delta T=0$ 

c)  $\Delta V=0$ 

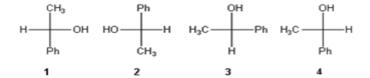
d)  $\Delta H=0$ 

(9) 100g of ice at 0 °C was melted to 100g of water at 0 °C. Given latent heat of fusion of ice at 0 °C is 80 Cal per g. The  $\Delta U$  of the process is

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a) 1000 Cal	b) 2000 Cal
c) 4000 Cal	d) 8000 Cal
(10) For the reaction $2SO_2(g) O_2(g)=2SO_3(g)$ , whic	h of the following is maintained?
a) ΔH>ΔU	b) ΔH=ΔU
c) ΔH<ΔU	d) $\Delta H=1/\Delta U$
(11) In a reversible cyclic process the entropy chang	ge is
a) Positive	b) Zero
c) Negative	d) Unpredictable
(12) In what process is the internal energy unchange	rd?
a) Reversible cyclic process	b) Irreversible process
c) Isothermal process	d) Both reversible and irreversible process.
(13) Both heat (q) and work (w) are not state function	ons. Which of the following is correct for (q+w)?
a) State function	b) Path function
c) Both path and state function	d) All of the above
(14) The relation between $\Delta G$ of the cell reaction an	d emf E of the cell is given by
a) ΔG=-nFE	b) ΔG=nFE
c) ΔG=FE/n	d) ΔG=n/FE
(15) Standard hydrogen electrode has been assigned	to a potential of
a) 1.5 Volt	b) 1.0 Volt
c) 0.5 Volt	d) 0 Volt
(16) Which one is true for a galvanic cell?	
a) The cell potential is always positive	b) The cell potential is always negative
c) $\Delta G$ for the cell reaction is positive	d) $\Delta G$ for the cell reaction is zero
(17) In normal hydrogen electrode the activity of H	ion is
a) 0.2	b) 2.0
c) 0.1	d) 1.0
(18) The unit of van der Waal's constant "a" is	
a) $a \text{tm } L^2 \text{mol}^{-1}$	b) $atm L^{-2}mol^{-2}$
c) $atm L^2mol^{-2}$	d) $mol^{-1}L^{-1}$
(19)	
The critical constant (V <sub>c</sub> ) of a van der Waal's	gas is given by
a) $V_C$ =3b	b) $V_C=2b$
c) $V_C = b/3$	d) $V_C=b/2$
(20) For an ideal gas undergoing isothermal reversib	ole expansion which of the following is true
a) ΔG=ΔA	b) $\Delta G=1/\Delta A$
c) $\Delta G=2\Delta A$	d) $\Delta G=2/\Delta A$
(21) According to the second law of thermodynamic change in a state function (q=heat change)?	cs which of the following quantities represent the
a) q <sub>rev</sub>	b) $q_{rev}/T$
c) Tq <sub>rev</sub>	d) T/q <sub>rev</sub>
(22) The stereoisomers which rotates the plain polar	ized light towards right is known as
a) R	b) D
c) S	d) d
(23) Compounds which have different arrangements ed to each other are said to have	of atoms in space while having same atoms bond

a) Position isomerism	b) Functional group isomerism	
c) Chain isomerism	d) Stereoisomerism	
(24) If a solution of a compound (30.0 g/100 mL of solution m tube, the specific rotation is:	on) has a measured rotation of +15° in a 2 d	
a) +50°	b) +25°	
c) +15°	d) +4.0°	
(25) Total number of conformations of ethane are		
a) 2	b) 1	
c) 3	d) 4	
(26) Let there be four groups OH, D, H, NH <sub>2</sub> attached to priority sequence	the chiral carbon, Which one will have least	
a) OH	b) D	
c) H	d) NH <sub>2</sub>	
(27) In case of Carbohydrate which chiral carbon is taken	to assign D,L nomenclature	
a) First	b) last	
c) Both first and last	d) Second	
(28) In flying wedge projection formulae, horizontal bond	<b>'</b>	
a) Above the plane of the paper	b) Below the plane of the paper	
c) On the plane of the paper	d) Both above and below the plane of the paper	
(29) The crystal field stabilization energy(CFSE) value for mum at 492 nm is	· · · · · · · · · · · · · · · · · · ·	
a) 20325 cm <sup>-1</sup>	b) 12195 cm <sup>-1</sup>	
c) 10162 cm <sup>-1</sup>	d) 8130cm <sup>-1</sup>	
(30) Saw horse projection formulae is		
a) 3D	b) 2D	
c) 1D	d) All of these	
(31) Non superimposable mirror images are known as		
a) Enantiomers	b) Diasteromers	
c) Optical isomers	d) Isomers	
(32) Cis 2-butene and trans 2-Butene are		
a) Configurational isomers	b) Diasteroisomers	
c) Both configuratational isomers and diasteroisome rs	d) Conformational isomers	
(33) In staggered conformations of n-butane, two methyl	groups are separated at an angle	
a) 30°	b) 60°	
c) 90°	d) 180°	
(34) Optical rotation depends on		
a) Nature of sample and solvent	b) Temperature of medium	
c) Wavelength of light used	d) All of these	
(35) At a constant temperature the optical angle of rotatio	n is proportional to the	
a) Concentration of the solution of optically active molecules	b) Length of the polarimeter tube	
c) Specific rotation	d) Both concentration of molecule and length of po arimeter tube	
(36) Which of the following Fischer projections is different	nt from the other three?	



a) 1

b) 2

c) 3

d) 4

(37) 1-butene on ozonolysis produces

a) Formaldehyde only

b) Propanal only

c) Both Formaldehyde and propanal

d) Acetone only

(38)

Which of the following terms best describes the following pair of molecules?



a) Isomers

b) Configurational isomers

c) Constitutional isomers

d) Geometrical isomers

(39) What is the major product of the reaction between CH<sub>3</sub>-CH<sub>2</sub>-CH(NMe<sub>3</sub>) -CH<sub>3</sub> with NaOH?

a) 1-butene

b) 2-butene

c) Ethylene

d) Propene

(40) In nitration the electrophile is

a) NO<sub>3</sub>-

b) HNO<sub>3</sub>

c)  $NO_2^+$ 

d)  $N_2O_6$ 

(41) Which one is more effective in nucleophilic addition reaction?

a) CH<sub>3</sub>CHO

b) CH<sub>3</sub>COCH<sub>3</sub>

c) PhCHO

d) HCHO

(42) Which of the following electronic configuration is likely to have highest electronegativity

a)  $ns^2np^3$ 

b)  $ns^2np^4$ 

c)  $ns^2np^5$ 

d)  $ns^2np^6$ 

(43) Which statement is true?

- a) The electronegativity of elements increases along the period
- / 113 11p

he period

- c) The chemical reactivity of elements increases alo ng the period
- d) The chemical reactivity of element decreases alon g the period

b) The electropositivity of elements increases along t

(44) The probability density is represented by

a) Square root of the wave function

b) Absolute value of the wave function

c) Inverse of the wave function

d) Absolute square of the wave function

(45) What is the CFSE of a free Co(II) ion on forming the tetrahedral chloro complex,  $[CoCl_4]^{2-}$  (in the unit of  $\Delta$ )?

a) 0.6

b) -1.2

c) 1.8

d) 2.4

(46)

According to Crystal Field Theory in the octahedral	complexes, the d orbital splits into
a) Higher energy t <sub>2g</sub> and lower energy e <sub>g</sub> level	b) Lower energy t <sub>2u</sub> and higher energy e <sub>u</sub> level
c) Lower energy $t_{2g}$ and higher energy $e_g$ level	d) Lower energy e <sub>u</sub> and higher energy t <sub>2u</sub> level
(47) In which of the following coordination entities the m will be maximum?	agnitude of $\Delta_0$ (CFSE in octahedral field)
a) $[Co(H_2O)_6]^{3+}$	b) $[Co(NH_3)_6]^{3+}$
c) [Co(CN) <sub>6</sub> ] <sup>3</sup> -	d) $[Co(C_2O_4)_3]^{3-}$
(48) For a particle inside a box, the potential is maximum	at $x =$
a) L	b) 2L
c) L/2	d) 3L
(49) Molecule for which the bonding pair of electrons is ea	,
a) Homoneuclear diatomic	b) bAtomic
c) Semi nuclear	d) Hetroneuclear diatomic
(50) Electrons should be filled in energy sub shells in order e of	
a) Aufbau	b) Pauling's
c) Pauli's exclusion	d) Hund's
(51) Which of the following notations is not used to distin	guish between pairs of enantiomers?
a) R and S	b) E and Z
c) +and -	d) D and L
(52) The efficeincy of a heat engine is maximum when the	e
a) Temperature difference of source and sink is maxi mum.	b) Temperature difference of source and sink is minimum.
c) Temperature of source is greater than that of sink.	d) Temperature of sink is greater than that of source.
(53) Which of the following compounds can exhibit geom	etrical isomerism?
a) 1-Hexene	b) 2-Methyl-2-Pentene
c) 3-methyl-1-pentene	d) 2-Hexene
(54) Conformations are different arrangements of atoms thation about	nat can be converted into one another by rot
a) Covalent bond	b) Double bond
c) Single bond	d) Triple bond
(55) What type of reaction takes place upon treatment of a	ketone with HCN to form a cyanohydrin?
a) Nucleophilic addition	b) Electrophilic substitution
c) Nucleophilic substitution	d) Electrophilic addition
(56) The shift of absorption maxima towards higher wavel	length is called
a) Blue shift	b) Red shift
c) Auxochrome	d) Chromophore
(57) The shift of absorption maxima towards lower wavele	ength is called
a) Auxochrome	b) Chromophore
c) Blue shift	d) Red shift
(58) Cis stilbene has lower wavelength than trans stilbene	due to
a) Presence of steric repulsion between two benzene rings in cis stilbene	b) Presence of steric repulsion between two H atoms in cis stilbene
c) Presence of steric repulsion between two benzene rings in trans stilbene	d) Presence of steric repulsion between two H atoms in trans stilbene
(59) Ozonolysis of Ethylene produces	of 6
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a) Formaldehyde	b) Acetaldehyde
c) Butanal	d) Acetone
60) In bromination of benzene the electrophi	le is
a) Cl	b) Br <sup>+</sup>
c) Br-	d) Br <sub>2</sub>
61) What is the effect of the optical angle of the concentration of the molecule is doubt	of rotation ( $\alpha$ ) if length of polarimeter tube is halved and bled
a) α remains same	b) α gets halved
c) α gets four times	d) α eight times
62) Which statement is not true for wave fun	ction, $\psi$ ?
a) Must be single-valued	b) Must be continuous
c) Must be infinite	d) Must be normalized
63) The decreasing order of atomic radii of I	i, B, C, F is
a) Li< B< C< F	b) Li> B< C< F
c) Li> B> C< F	d) Li> B> C> F
64) The entropy of mixing of two ideal gases	s at constant pressure and temperature
a) Decreases	b) Increases
c) Remain unchanged	d) Both a and b
65) One mole of an ideal gas expands from 5	S liter to 50 liter at 298 K. The value of $\Delta S/R$ is equal to
a) 0.693	b) 0.2303
c) 2.303	d) 6.93
66) Two moles of an ideal gas expand sponta	aneously into vacuum. The work done is
a) 2 J	b) 4 J
c) Zero	d) 6 J
67) A process which is carried out at a consta	ant pressure is known as
a) Isothermal process	b) Isobaric process
c) Isochoric process	d) Reversible process
68) Which one of the following is an intensiv	ve property?
a) Enthalpy	b) Entropy
c) Density	d) Internal energy
69) ΔE of a process is equal to	,
a) Heat change at constant pressure	b) Heat change at constant volume
c) Work done	d) Temperature change
70) The value of $\Delta H$ - $\Delta E$ for a reaction invo	lving gaseous substances is
a) ΔnRT	b) Δn/ RT
c) $\Delta nR/T$	d) RT/Δn