RESOURCES FOR

"HSC-I CHEMISTRY"

ZUEB EXAMINATIONS 2021

PREFACE:

The ZUEB examination board acknowledges the serious problems encountered by the schools and colleges in smooth execution of the teaching and learning processes due to sudden and prolonged school closures during the covid-19 spread. The board also recognizes the health, psychological and financial issues encountered by students due to the spread of covid-19.

Considering all these problems and issues the ZUEB Board has developed these resources based on the condensed syllabus 2021 to facilitate students in learning the content through quality resource materials.

The schools and students could download these materials from www.zueb.pk to prepare their students for the high quality and standardized ZUEB examinations 2021.

The materials consist of examination syllabus with specific students learning outcomes per topic, Multiple Choice Questions (MCQs) to assess different thinking levels, Constructed Response Questions (CRQs) with possible answers, Extended Response Questions (ERQs) with possible answers and learning materials.

ACADEMIC UNIT ZUEB:

TABLE OF CONTENTS:

1: Multiple Choice Questions:

The Multiple-Choice Questions with a stem, correct answer and 3 distractors or plausible wrong answers format is designed to assess the content and thinking of students from; R (Remembering); U(Understanding) and A (Applying, Analyzing, Evaluating, Creating). The questions are also classified into three difficulty levels accordingly; D(DIFFICULT), M (MODERATE), E (EASY)

HOW TO ATTEMPT AN MCQ:

MCQ:

- **EACH MCQ HAS FOUR OPTIONS, A, B, C AND D. SELECT ONE OPTION AS THE BEST ANSWER AND FILL IN THE CIRCLE OF THAT OPTION, FOLLOWING THE INSTRUCTIONS GIVEN BY THE INVIGILATOR.**
- **USE BLACK PEN/PENCIL TO FILL IN THE CIRCLE.**

S#	MCQ'S MATERIAL	KEY	CL	DL
	CHAPTER # 1 INTRODUCTION TO FUNDAMENTAL CONCEPT IN CHEMISTRY			
1	Which number has five significant Figures: A. 402.10 B. 4000 C. 80000 D. 40300	**A. 402.10**	**R**	**E**
2	This one of the following pairs has the same no. of molecules: A. 10g H_2 and 10g CH_4 B. 10g H_2 and 50g CH_4 C. 10g H_2 and 80g CH_4 D. 10g H_2 and 16g CH_4	**C. 10g H_2 and 80g CH_4**	**A**	**D**
3	This number has five significant figures A. 391.10 B. 300002 C. 30000 D. 10300	**A. 391.10**	**R**	**E**
4	The volume of 3.01×10^{23} molecules of N_2 gas at S.T.P will be: A. 3 dm^3	**B. 11.2 dm^3**	**U**	**M**

	B. 11.2 dm^3 C. 22.4 dm^3 D. 28 dm^3			

5	The octet rule is not valid for:
	    A. N$_2$
	    B. CO$_2$
	    C. O$_2$
	    D. H$_2$
		D. H$_2$	**R**	**E**

6	The empirical formula of a compound is CH$_2$O and molecular mass is 60. Its molecular formula is:
	    A. CH$_2$O
	    B. C$_2$H$_4$O$_2$
	    C. C$_3$H$_6$O$_3$
	    D. C$_4$H$_8$O$_4$
		B. C$_2$H$_4$O$_2$	**A**	**M**

7	Which of the following Do NOT have the same number of molecules at S.T.P?
	    A. 1dm^3 of N$_2$ and O$_2$
	    B. 500cm^3 of Cl$_2$ and O$_2$
	    C. 100 cm^3 of CO$_2$ and O$_2$
	    D. 0.2cm^3 of Cl$_2$ and 0.3cm^{3}SO$_2$
		D. 0.2cm^3 Cl$_2$ and 0.3cm^3 SO$_2$	**A**	**D**

8	At S.T.P, 0.1 mole of a gas occupies the volume:
	    A. 22.4dm^3
	    B. 2.24 dm^3
	    C. 2.4ft^3
	    D. 100cm^3
		B. 2.24 dm^3	**U**	**M**

9	The number of moles in 58.5 g ofNaCl is
	    A. 58.5 moles
	    B. 35.5moles
	    C. 23 moles
	    D. 1 mole
		D. 1 mole	**R**	**E**

10	A beaker containing 180 gm of water contains:
	    A. 6.02 x 10^{23} molecules
	    B. 6.02 x 10^{24} molecules
	    C. 10.02 x 10^{25} molecules
	    D. 12.01 x 10^{23} molecules
		B. 6.02 x 10^{24} molecules	**A**	**M**

11	The relative atomic mass of Chlorine (Cl) is 35.5 amu, the mass in gram of 0.5 mole of chlorine gas is
	    A. 17.75 gm
	    B. 35.5gm
	    C. 71g
	    D. 142gm
		B. 35.5gm	**R**	**E**

12	44 gm of CO$_2$ contains ___ moles of CO$_2$
	    A. One
	    B. Three
	    C. Two
	    D. Eight
		A. One	**R**	**E**

13	For the equation CaCO$_3$ →CO$_2$ + CaO when 0.72 moles of Calcium carbonate burn it forms _____moles of CO$_2$
	    A. 0.36
	    B. 1.44
	    C. 0.72
	    D. 1
		C. 0.72	**U**	**M**

14	Find the volume of HCl when 500dm^3 of chlorine gas react			

	with Hydrogen			
	$H_2 + Cl_2 \rightarrow 2HCl$ A. $500dm^3$ B. $1000dm^3$ C. $250dm^3$ D. $1000dm^3$	**D. $1000dm^3$**	U	D
15	What is 24 moles of $CaCO_3$ in grams? A. 100 B. 480 C. 240 D. 2400	**D. 2400**	R	E
16	What is the molecular formula for a compound with the empirical formula: K_2SO_4 and a molecular mass of 696g? A. K_2SO_4 B. K_8SO_{16} C. $K_8S_4O_8$ D. $K_8S_4O_{16}$	**C. $K_8S_4O_8$**	U	D
17	What is the empirical formula of a molecule containing 18.7% of Lithium, 16.3% of Carbon and 65.0% of oxygen? A. CO_2Li_3 B. Li_2CO_3 C. Li_3CO_2 D. $LiCO_5$	**B. Li_2CO_3**	U	D
18	What is the molecular formula if the empirical formula is CH_2O and the molecular molar mass is 180.18? A. CH_2O B. $C_2H_4O_2$ C. $C_4H_8O_4$ D. $C_6H_{12}O_6$	**D. $C_6H_{12}O_6$**	U	M
19	What is the empirical formula for the following molecular formula: C_5H_{12} A. C_5H_{12} B. CH_3 C. CH_2 D. $C_{2.5}H_6$	**C. CH_2**	R	E
20	Mole ratios are obtained from the A. balanced chemical equation B. Periodic table C. molar mass D. formula mass	**A. balanced chemical equation**	A	M

S#	MCQ'S MATERIAL	KEY	CL	DL
	CHAPTER # 2 THREE STATES OF MATTER			

1	An ideal gas obeys gas laws at A. High temperature B. High Pressure C. All temperature and Pressure D. Low temperature	**C. All temperature and Pressure**	**R**	**E**
2	The process of direct conversion of solid into vapours is A. Condensation B. Sublimation C. Evaporation D. Neutralization	**B. Sublimation**	**R**	**E**
3	Capillary action of liquid is due to A. Viscosity B. Surface tension C. Fluidity D. Density	**B. Surface tension**	**U**	**M**
4	The SI unit of viscosity is: A. Poise B. Milli poise C. Centipoise D. $N.s.m^{-2}$	**D. $N.s.m^{-2}$**	**R**	**M**
5	If a=b≠c and $\alpha = \beta = \Upsilon = 90^0$ the crystal structure is A. Cubic B. Tetragonal C. Orthorhombic D. Triclinic	**B. Tetragonal**	**A**	**M**
6	The rate of diffusion of CO_2 is equal to that of: A. CH_4 B. CO C. C_3H_8 D. SO_6	**B. C_3H_8**	**R**	**D**
7	The melting points of those substances which expand on melting increase when the pressure is A. Decreased B. Increased C. Kept unchanged D. Atmospheric	**B. Increased**	**A**	**M**
8	The atmospheric pressure recorded in different places at the same time are given below: | Nathiagali	Hunza	Muree	Gilgit
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700 torr	650 torr	710 torr	600 torr | Water will boil first	**D. Gilgit**	**A**	**E**

	A. Nathiagali B. Hunza C. Muree D. Gilgit			
9	Gases behave ideally in these conditions: A. High pressure and high temperature B. High pressure and low temperature C. low pressure and high temperature D. low pressure and low temperature	C. low pressure and high temperature	U	M
10	Glass is a/an: A. Crystalline solid B. Amorphous solid C. Covalent solid D. Ionic solid	B. Amorphous solid	R	E
11	If a=b=c and $\alpha =\beta = \Upsilon = 90^0$ then the shape of the crystal is A. Cubic B. Tetragonal C. Hexagonal D. Orthorhombic	A. Cubic	A	D
12	The basis of motor oil grading is: A. Viscosity B. Surface tension C. Vapour pressure D. Boiling point	A. Viscosity	U	M
13	Diamond is very hard because of: A. sp^2- Hybridization B. Vander Waals forces C. Close packing of carbon atoms and large number of covalent bonds D. Large amount of energy is required to break the bond	C. Close packing of carbon atoms and large number of covalent bonds	U	M
14	The presence of Hydrogen bonding in a liquid: A. increase the vapour pressure B. Decrease the Boiling Point C. Decreases the viscosity D. Causes no effect on Physical properties of the liquid	C. Decreases the viscosity	R	M
15	If a≠b≠c and $\alpha = \Upsilon = 90^0$ and $\beta \neq 90^0$ the shape of the crystal is A. Tetragonal B. Monoclinic C. Hexagonal D. Triclinic	B. Monoclinic	A	D

16	The vapour pressure of water at 100^0C A. 760 torr B. 76 torr C. 14.2psi D. none of these	**A. 760 torr**	**U**	**M**
17	Two solids, having the same crystalline structure are called: A. Isomorphous B. Polymorphous C. Isotopes D. Allotropes	**A. Isomorphous**	**R**	**E**
18	On Kelvin scale absolute zero is equal to A. 273.16^0 C B. 0^0C C. 20K D. -273.16^0C	**A. -273.16^0C**	**R**	**E**
19	the number of crystal system on basis of unit cell is A. 5 B. 6 C. 7 D. 8	**C. 7**	**U**	**M**
20	The value of R (Gas constant) when pressure is expressed in N/m^2 is A. *0.0821 dm^3 atmosphere K^{-1} mol^{-1} B. 8.3143 J K^{-1} mol^{-1} C. 8.213 dm^3 atmosphere K^{-1} mol^{-1} D. 9.8 J K^{-1} mol^{-1}	**B. 8.3143 J K^{-1} mol^{-1}**	**R**	**E**
21	Real gases are nearer to ideality at A. High temperature and low pressure B. High temperature and high pressure C. Low temperature and Low pressure D. Low temperature and High pressure	**A. High temperature and low pressure**	**U**	**D**
22	The volume of a gas could theoretically be zero at A. 0^0C B. 0K C. 273K D. -273^0C	**C. -273^0C**	**R**	**E**
23	The total pressure of a mixture of gases is the sum of partial pressure of each gas present in the mixture This is stated by A. Daltons B. Graham C. Charles	**A. Daltons**	**A**	**E**

		KEY	CL	DL
	D. Boyles			
24	The unit of viscosity is A. milli poise B. Milligram C. Joule D. Ampere	**A. milli poise**	**R**	**E**
25	Real gases deviate from ideality a A. High T & low P B. Low T & High P C. High T & High P D. Low T & Low P	**B. Low T & High P**	**A**	**M**
26	The boiling point of a liquid _____ with increase in pressure A. Decrease B. Increase C. Remain constant D. Not effected	**B. Increase**	**A**	**D**
27	The melting point of those substance which expand on melting increase when the pressure is A. Decrease B. Increase C. Kept unchanged D. Atmospheric	**B. Increase**	**U**	**M**
28	In comparison of rate diffusion, Helium diffuses _____times as of SO_2 A. Half time B. two C. four D. Eight	**C. four**	**R**	**E**
29	This instrument is used to measure atmospheric pressure A. Barometer B. Colorimeter C. Spectrometer D. Voltmeter	**A. Barometer**	**R**	**E**
30	Graphite can conduct electricity A. from any direction B. Parallel to plane C. Perpendicular to plane D. diagonal to plane	**B. Parallel to plane**	**U**	**M**

S#	MCQ'S MATERIAL	KEY	CL	DL
	CHAPTER # 3 ATOMIC STRUCTURE			

1	The maximum number of electrons accommodated in f-orbital is A. 7 B. 10 C. 14 D. 15	C. 14	U	E
2	$(n + l)$ value for 5d orbital is A. 4 B. 5 C. 6 D. 7	D. 7	R	M
3	This color has the shortest wavelength in the visible spectrum is A. red B. Violet C. Green D. Yellow	B. Violet	U	M
4	This series of lines is produced when the electron jumps from 4th to 2nd orbit A. Lyman B. Balmer C. Brackette D. Paschen	B. Balmer	A	M
5	The maximum number of electrons in a particular energy level is : A. $2n^2$ B. n^2 C. $2(2n+1)$ D. $2(2l + 1)$	A. $2n^2$	A	M
6	The energy of each quantum of radiation is directly proportional to its: A. wavelength B. Frequency C. Wave number D. Source of energy	B. Frequency	R	D
7	These radioactive rays are non-material in nature A. α rays B. β rays C. ϒ rays D. canal rays	C. ϒ rays	A	M
8	The potential energy of an electron can be denoted by : A. Ze^2/r^2 B. Ze/r C. Ze^2/r D. $-Ze^2/r$	D. $-Ze^2/r$	A	E
9	Most of the radiations coming from pitchblende were : A. Protons B. Electrons C. Positrons D. Neutrons	B. Electrons	U	M
10	The number of orbitals in each energy level is given by formula : A. $2n^2$ B. $(2l+1)$ C. $2(2l+1)$ D. n^2	D. n^2	R	E
11	The uncertainty principle is applied to : A. Aeroplane	C. Electron	A	D

	B. Cricket ball C. Electron D. Earth			
12	Quantum number values of 3d orbital are A. n=3, l=2 B. n=3,l=3 C. n=2,l=2 D. n=3,l=0	**A. n=3, l=2**	**U**	**M**
13	The value of Planck's constant h is A. 4.803×10^{-10} e.s.u B. 9.1×10^{-31} kg C. 6.625×10^{-34} J.S D. 1.602×10^{-34} Kg	**C. 6.625×10^{-34} J.S**	**U**	**M**
14	The n + l value of 4p orbital is A. 2 B. 5 C. 7 D. 4	**B. 5**	**R**	**M**
15	The particles having the mass 1836 times that of electron is: A. Neutron B. Proton C. Meson D. Hyperon	**B. Proton**	**A**	**D**
16	On emission of α- particles, $_{92}U^{238}$ changes into : A. $_{90}Th^{234}$ B. $_{88}Ra^{226}$ C. $_{84}Po^{210}$ D. $_{91}Pa^{231}$	**A. $_{90}Th^{234}$**	**U**	**M**
17	No two electrons can have all the four quantum numbers identical. Is the statement of? A. Pauli's exclusion principle B. Hund's rule C. Aufbau rule D. (n+l) rule	**A. Pauli's exclusion principle**	**R**	**E**
18	The maximum number of unpaired electrons in 3d energy level is A. 5 B. 6 C. 7 D. 8	**A. 5**	**R**	**E**
19	An electron is said to be excited when it A. Loses energy B. Jumps to lower orbit C. Jumps to higher orbit D. enters the atom	**C. Jumps to higher orbit**	**U**	**M**
20	An orbital can have a maximum number of A. 2 electrons B. 6 electrons C. 8 electrons D. 32 electrons	**C. 8 electrons**	**R**	**E**
21	The colour of light depends upon its A. Wavelength B. Velocity C. Source D. None	**A. Wavelength**	**U**	**D**
22	If the ionic radii of K^+ and F^- are about 1.34^0A , the expected value of atomic radii of K and F is respectively	**B. 2.31^0A & 0.64^0A**	**R**	**E**

	A. 1.34^0A & 1.34^0A B. 2.31^0A & 0.64^0A C. 0.64^0A & 2.31^0A D. 2.31^0A & 1.34^0A			

23	Quantum number values for 2p orbitals are
	    A. n=1, l=0
	    B. n=2 , l=0
	    C. n=2 , l=2
	    D. n=2 , l=1
		D. n=2 , l=1	**A**	**E**

24	The e/m value for positive rays is maximum for
	    A. Hydrogen
	    B. Helium
	    C. Oxygen
	    D. Nitrogen
		A. Hydrogen	**R**	**E**

25	Quantum number values for 2p orbitals are
	    A. n=1 , l=0
	    B. n=2 , l=0
	    C. n=2 , l=2
	    D. n=2 , l=1
		D. n=2 , l=1	**A**	**M**

26	This is not isoelectronic with Na^{+1}
	    A. Ne
	    B. F^{-1}
	    C. Mg^{+2}
	    D. K^{+1}
		D. K^{+1}	**A**	**D**

27	In the following configuration, rules violated are : $1S^2$, $2S^2$, $2Px^2,2Py^1, 2Pz^0,3S^2,3P^6$
	    A. Aufbau and (n +l) rule
	    B. (n+l) and Hund's rule
	    C. Aufbau and Hund's rule
	    D. Aufbau, (n+l) and Hund's rule
		C. Aufbau and Hund's rule	**U**	**M**

28	This spectrum behaves as Fingerprint for the identification of any element::
	    A. Continuous
	    B. line
	    C. Emission
	    D. none of them
		D. none of them	**R**	**E**

29	Select the isoelectronic with Mg^{+2}
	    A. K^+
	    B. Na^+
	    C. Ne
	    D. Cl^-
		B. Na^+	**R**	**E**

30	The charge of an electron is _____Coulomb.
	    A. -2.46×10^4
	    B. -1.6×10^{-19}
	    C. 1.6×10^{-19}
	    D. $109678cm^-$
		B. 1.6×10^{-19}	**U**	**M**

31	The value of Rydberg constant is
	    A. $109678cm^-$
	    B. $109678m^-$
	    C. $901768cm^-$
	    D. $901867cm^-$
		A. $109678 cm^-$	**A**	**M**

32	The following pair of ions is isoelectronic :
	    A. Na^{+1} & Mg^{+2}
	    B. F^- & O^-
	    C. Li^+ & Na^+
	    D. S^{-2} & O^{-2}
		A. Na^{+1} & Mg^{+2}	**A**	**D**

33	An orbital can have a maximum of ____ electron A. 2	**A. 2**	**U**	**M**

	B. 6 C. 10 D. 32			

34	If the difference of electronegativity value for two bonding atoms is less than 1.7 the bond will be
	    A. Totally polar
	    B. Non- polar
	    C. ionic
	    D. Covalent
		D. Covalent	**R**	**E**

35	The large values of Electron affinity shows that the elements are
	    A. Strong Reducing agent
	    B. Strong Oxidizing agent
	    C. Electropositive
	    D. Neutral
		B. Strong Oxidizing agent	**R**	**E**

36	For M shell the number of orbitals are
	    A. 1
	    B. 4
	    C. 9
	    D. 16
		C. 9	**U**	**M**

37	Lyman series is related to _____ region
	    A. visible
	    B. ultraviolet
	    C. Infrared
	    D. Infra-red
		B. ultraviolet	**R**	**E**

38	Visible region belongs to _____ series
	    A. Lyman
	    B. Balmer
	    C. Brackette
	    D. Paschen
		B. Balmer	**U**	**M**

39	This source does not give a continuous spectrum .
	    A. Air
	    B. Sunlight
	    C. Bulb
	    D. inert gas lamp
		D. inert gas lamp	**U**	**M**

40	Charge was discovered by
	    A. Moseley
	    B. Rutherford
	    C. Faradays
	    D. JJThomson
		C. Faradays	**U**	**M**

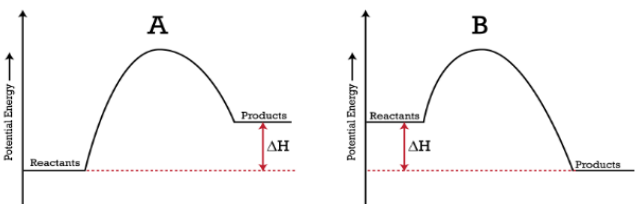| S#	MCQ'S MATERIAL	KEY	CL	DL
	CHAPTER # 4 CHEMICAL BONDING			

1	This is not a primary bond:
	    A. Ionic bond
	    B. Covalent bond
	    C. Dative bond
	    D. Hydrogen bond
		D. Hydrogen bond	A	E

2	This one of the following compound has zero dipole moment:
	    A. NH_3
	    B. CCl_4
	    C. HF
	    D. H_2O
		B. CCl_4	R	M

3	The Hydrogen halide has the highest percentage	A. HF	U	M

	of ionic character:
	  A. HF
	  B. HCl
	  C. HBr
	  D. HI			

4	1 Debye is equals to
	  A. 2.25×10^{-33}
	  B. 3.4×10^{-40}
	  C. 3.335×10^{-23}
	  D. 3.335×10^{-30}
		C. 3.335×10^{-30}	**R**	**M**

5	The molecule has the maximum bond angle
	  A. CS_2
	  B. NH_3
	  C. SO_2
	  D. H_2O
		A. CS_2	**A**	**E**

6	The energy of this bond is greatest
	  A. CH_4
	  B. O_2
	  C. N_2
	  D. Cl_2
		C. N_2	**R**	**D**

7	The dipole moment of this molecule is zero
	  A. NH_3
	  B. CO_2
	  C. H_2O
	  D. HCl
		B. CO_2	**A**	**M**

8	The number of bond in C_2H_2 molecule is :
	  A. One σ and two π bonds
	  B. three σ and one π bonds
	
	  C. Three σ and two π bonds
	  D. Two σ and two π bonds
		C. Three σ and two π bonds	**A**	**E**

9	The molecule has the maximum Bond angle
	  A. NH_3
	  B. CO_2
	  C. H_2O
	  D. HCl
		B. CO_2	**U**	**M**

10	The energy of this bond is greatest
	  A. CH_4
	  B. O_2
	  C. N_2
	  D. Cl_2
		C. N_2	**R**	**E**

11	The S.I unit of Dipole moment is
	  A. Dyne/cm
	  B. Poise
	  C. Debye
	  D. Coulomb – metre
		D. Coulomb – mètre	**A**	**D**

12	Dipole moment of CS_2 is zero , Hence the bond angle is :
	  A. 90°
	  B. 109.5°
	  C. 120°
	  D. 180°
		D. 180°	**U**	**M**

13	The presence of Hydrogen bonding in a liquid : A. increase the vapour pressure B. Decrease the Boiling Point C. Decreases the viscosity D. Causes no effect on Physical properties of the liquid	C. Decreases the viscosity	U	M
14	Bond energy of Hydrogen bond is in between : A. 10 -20 KJ/mol B. 20 – 40 KJ/mol C. 40 -50 KJ/mol D. 50 -60 KJ/mol	B. 20 – 40 KJ/mol	R	M
15	The bond formed in fluorine molecule is due to the overlap of orbitals A. s-s B. s-p C. p-p D. none of these	C. p-p	A	D
16	Bond energy of $C\equiv C$ as compared to $C=C$ is : A. greater B. Lesser C. same D. none of these	A. greater	U	M
17	The angle between sp^3 orbitals is: A. 127° B. 109.5° C. 180° D. 90°	B. 109.5°	R	E
18	The strength of sigma bond is higher for A. s-s overlap B. s-p overlap C. p-p overlap D. $sp^3 – s$ overlap	C. p-p overlap	R	E
19	the dipole moment of Cl_2 molecule is A. 0.00 B. 1.03 D C. 1.85 D D. 1.67D	A. 0.00	U	M
20	The single bond which is covalent in nature is A. Pi- bond B. Sigma bond C. Coordinate covalent bond D. None of these	B. Sigma bond	R	E
21	The sp^2 hybrid orbitals are A. Non planar B. Coplanar C. Linear D. None of these	B. Coplanar	U	D
22	Which bond is nonpolar	A. Cl –Cl	R	E

	A. Cl –Cl B. N- Cl C. C- Cl D. H – Cl			

23	Which atomic orbital is always involved in sigma bonding
	  A. s- orbital
	  B. p- orbital
	  C. d- orbital
	  D. None of these
		A. s- orbital	**A**	**E**

24	In ethene (C_2H_4) molecule there are
	  A. Five sigma bonds and one pi bond
	  B. six sigma bonds
	  C. Four sigma bonds and two pi bonds
	  D. None of these
		A. Five sigma bonds and one pi bond	**R**	**E**

25	When gaseous anion and cations are brought closer , the energy involved is
	  A. Electron affinity
	  B. Lattice energy
	  C. Electronegativity
	  D. Ionisation potential
		B. Lattice energy	**A**	**M**

26	A molecule of AB_2 type undergoes sp^3 hybridization with two non – bonding electron pairs ,its geometry should be
	  A. Linear
	  B. Bent
	  C. Pyramidal
	  D. Regular Tetrahedron
		B. Bent	**A**	**D**

27			U	M
28			R	E
29			R	E
30			U	M

S#	MCQ'S MATERIAL	KEY	CL	DL
CHAPTER # 5 CHEMICAL ENERGETICS				

1	One Joule is equals to
	  A. 0.239 Cal
	  B. 0.391 Cal
	  C. 0.398 Cal
	  D. 4.184 Cal
		A. 0.239 Cal	**R**	**E**

2	This is not an extensive property
	  A. Internal energy
	  B. Enthalpy
	  C. Density
	  D. Entropy
		C. Density	**R**	**E**

3	This is an intensive property:
	  A. Internal energy
	  B. Enthalpy
	  C. Volume
	  D. Refractive index
		D. Refractive index	**U**	**B**

4	The bulk properties of a system that can be measured	C.	**R**	**M**

	easily are
	   A. Microscopic
	   B. Chemical
	   C. Macroscopic
	   D. Physical
		Macroscopic		

5	This is not Extensive property:
	   A. Entropy
	   B. Viscosity
	   C. Enthalpy
	   D. Internal Energy
		B. Viscosity	A	M

6	Any real or imaginary line or wall which separates a system from its surrounding, is called the
	   A. System
	   B. Boundary
	   C. State
	   D. Surrounding
		B. Boundary	R	D

7	1 Cal. Is equal to:
	   A. 0.239 J
	   B. 1.98 J
	   C. 4.184J
	   D. 8.314J
		C. 4.184J	A	M

8	The heat content of a system is called:
	   A. Internal energy
	   B. Enthalpy
	   C. Entropy
	   D. Potential energy
		B. Enthalpy	A	E

9	This is an intensive property
	   A. Density
	   B. Mass
	   C. Mole
	   D. Volume
		C. Mole	U	M

10	Hess's Law , may be used to calculate
	   A. ΔH
	   B. ΔS
	   C. ΔE
	   D. K
		A. ΔH	R	E

11	Energy of Disorder of a system to make a chemical reaction possible
	   A. Internal energy
	   B. Enthalpy
	   C. Entropy
	   D. Potential energy
		B. Enthalpy	A	D

12	The energy profile diagram for an exothermic reaction is shown below in which reactant is 15 J and energy at Point B is 40 J .The energy of activation of this reaction is A. 15 J	B. 25J	U	M

	B. 25J			
	C. 40 J			
	D. 55			

13	If the work is related with expansion, it is
	    A. Not done
	    B. Excess done
	    C. positive
	    D. Negative
		C. positive	**U**	**M**

14	If the Process is done at constant volume heat will be equals to
	    A. ΔH
	    B. ΔV
	    C. ΔS
	    D. ΔE
		D. ΔE	**R**	**M**

15	If the Process is done at constant Pressure heat will be equals to
	    A. ΔH
	    B. ΔV
	    C. ΔS
	    D. ΔE
		A. ΔH	**A**	**D**

16	When 500 joule of work is done by a system by absorbing 200 joule of heat what will be its ΔE
	    A. 300
	    B. 700
	    C. -700
	    D. -300
		D. -300	**U**	**M**

17	Thermal decomposition is
	    A. Exothermic reaction
	    B. Endothermic reaction
	    C. Reversible reaction
	    D. Irreversible reaction
		B. Endothermic reaction	**R**	**E**

18	Combustion is
	    A. Exothermic reaction
	    B. Endothermic reaction
	    C. Reversible reaction
	    D. Irreversible reaction
		A. Exothermic reaction	**R**	**E**

19	400 J work is done on a system by evolution of 50 J of heat ΔE will be
	    A. 350 J
	    B. -350 J
	    C. 450 J
	    D. -450 J
		A. 350 J	**U**	**M**

20	when the volume is constant the system is called as
	    A. Isobaric
	    B. Adiabatic
	    C. Isolated
	    D. Isochoric
		D. Isochoric	**R**	**E**

S#	MCQ'S MATERIAL	KEY	CL	DL
	CHAPTER # 6 CHEMICAL EQUILIBRIUM			

1	In the following reaction,$Kp > Kc$
	    A. $2NO_2 \Longleftrightarrow N_2O_4$
	    B. $H_2 + I_2 \Longleftrightarrow 2HI$
		C. $PCl_5 \Longleftrightarrow PCl_3 + Cl_2$	**R**	**E**

	C. PCl5 <==========> PCl3 + Cl2 D. 2SO2 + O2 <==========> 2SO3			
2	The equation of Ksp of CaF2 is A. Ksp = [Ca+2][F2] B. Ksp = [Ca+2][F-]2 C. Ksp = [Ca+ -][F-] D. Ksp = [Ca][F]	B. Ksp = [Ca+2][F-]2	**R**	**E**
3	For a reversible reaction, If the concentrations of reactants are doubled, then the equilibrium constant will: A. also be doubled B. Be halved C. Remain the same D. Become one-fourth	C. Remain the same	**U**	**M**
4	The yield of ammonia in Haber's process is favored by A. High pressure and high temperature B. High pressure and low temperature C. low pressure and high temperature D. low pressure and low temperature	B. High pressure and low temperature	**R**	**M**
5	The extent of reaction will be maximum for this Kc value: A. 10^{-3} B. 0.1 C. 10 D. 10^{3}	D. 10^{3}	**A**	**M**
6	With an increase in temperature of a system involving exothermic reaction will: A. move in the forward direction B. move in the reverse direction C. remain equilibrium D. none of these	B. move in the reverse direction	**R**	**D**
7	For the reaction 2NH3 ↔ N2 + 3H2 the relationship between Kc and Kp is : A. Kp = Kc B. Kp> Kc C. Kp< Kc D. Kp ≤ Kc	B. Kp> Kc	**A**	**M**
8	The most favourable conditions of temperature and pressure for oxidation of SO2 into SO3 is: A. low temperature and High pressure B. Low temperature and low pressure C. High temperature and High Pressure D. High temperature and low pressure	A. low temperature and High pressure	**A**	**E**
9	Addition of KCl to AgCl solution causes: A. increase in the ionization of AgCl B. Decrease in the ionization of AgCl C. No effect on the ionization of AgCl D. Increase in the concentration of Ag+ ion	B. Decrease in the ionization of AgCl	**U**	**M**
10	Precipitation occurs if the ionic concentration is: A. Less than Ksp B. More than Ksp C. equal to Ksp D. none of these	B. More than Ksp	**R**	**E**

11	If Kc is very small A. Reverse reaction will occur B. Forward reaction will take place C. More products will be formed D. None of these	A. Reverse reaction will occur	**A**	**D**
12	which of these reactions have same value of Kc and Kp A. $N_2 + 3H_2 \Longleftrightarrow 2NH_3$ B. $H_2 + I_2 \Longleftrightarrow 2HI$ C. $PCl_5 \Longleftrightarrow PCl_3 + Cl_2$ D. $2SO_2 + O_2 \Longleftrightarrow 2SO_3$	B. $H_2 + I_2 \Longleftrightarrow 2HI$	**U**	**M**
13	The solubility product (Ksp) of AgCl is 1×10^{-10} $mole^2\, dm^{-6}$. its precipitation occurs if the product of ionic concentration is A. less than Ksp B. greater than Ksp C. Equal to Ksp D. Twice to Ksp	B. greater than Ksp	**U**	**M**
14	The active masses of reacting substances means A. mole/dm3 B. gm/dm3 C. mol/cm3 D. gm/cm3	A. mole/dm3	**R**	**M**
15	The change of concentration of reacting substance in a unit time is A. Rate of reaction B. Rate constant C. Rate law D. Velocity constant	A. Rate of reaction	**A**	**D**
16	The degree of ionization of an electrolyte is suppressed by the addition of another electrolyte containing a common ion … this phenomenon is called as A. Solubility Product B. Common ion effect C. Le-Chatelier's principle	B. Common ion effect	**U**	**M**
17	When the product of ionic concentrations of sparingly soluble salt is greater to its solubility product the solution is said to be a A. Precipitated solution B. Saturated solution C. Supersaturated solution D. V.Dilute solution	A. Precipitated solution	**R**	**E**
18	When the product of ionic concentrations of sparingly soluble salt is equals to its solubility product the solution is said to be a A. Precipitated solution B. Saturated solution C. Supersaturated solution D. V.Dilute solution	B. Saturated solution	**R**	**E**
19	Addition of catalyst to a reversible reaction will _____ the rate of reaction A. Increases B. Decreases	C. does not Affect	**U**	**M**

	C. does not Affect D. Effect			

20	Solubility product is related to
	  A. soluble salts
	  B. Insoluble salts
	  C. Sparingly soluble salts
	  D. Coloured salts
		C. Sparingly soluble salts	**R**	**E**

S#	MCQ'S MATERIAL	KEY	CL	DL
CHAPTER # 7SOLUTION AND ELECTROLYTES			

1	Universal indicator in acid gives
	  A. Green colour
	  B. Pink color
	  C. Yellow color
	  D. Red color
		D. Red color	**R**	**E**

2	The oxidation number of Mn in K_2MnO_4 is
	  A. +2
	  B. +4
	  C. +6
	  D. +7
		C. +6	**R**	**E**

3	This ion has the greatest degree of Hydration:
	  A. Na^+
	  B. Mg^{+2}
	  C. Al^{+3}
	  D. K^+
		C. Al^{+3}	**U**	**M**

4	The molarity of a solution containing 53g Na_2CO_3 dissolved in $1dm^3$ solution will be:
	  A. 0.1
	  B. 0.01
	  C. 0.02
	  D. 0.5
		D. 0.5	**R**	**M**

5	the molarity of a solution containing 4 g NaOH dissolved in 10 ml solution is:
	  A. 0.4M
	  B. 0.1M
	  C. 10M
	  D. 1.0M
		C. 10M	**A**	**M**

6	The molarity of a solution containing 20g NaOH dissolved in $1dm^3$ solution will be:
	  A. 0.1
	  B. 0.5
	  C. 1
	  D. 2
		B. 0.5	**R**	**D**

7	When 2 moles of solute are present in $2dm^3$ of solution then the concentration of solution is:
	  A. 0.5M
	  B. 1 M
	  C. 2M
	  D. 3M
		B. 1M	**A**	**M**

8	The oxidation number of Sulphur in $NaHSO_4$ is:
	  A. -2
	  B. 0
	  C. +4
		D. +6	**A**	**E**

	D. +6			

9	Conduction in metal is due to the movement of
	   A. Ions
	   B. Electrons
	   C. Protons
	   D. Atoms
		B. Electrons	**U**	**M**

10	The volume of 0.2 M H_2SO_4 required for the neutralization of $10cm^3$ od 0.1 M NaOHis:
	   A. $2.5cm^3$
	   B. $5cm^3$
	   C. $10cm^3$
	   D. $15 cm^3$
		B. $5cm^3$	**R**	**E**

11	The pH of milk of Magnesia is:
	   A. 10.5
	   B. 10.0
	   C. 10.8
	   D. 11.0
		A. 10.5	**A**	**D**

12	The percentage dissociation of NH_4OH is:
	   A. 1.2%
	   B. 1.4%
	   C. 1.9%
	   D. 2.1%
		B. 1.4%	**U**	**M**

13	Metals placed above Hydrogen in the electrochemical series:
	   A. Are reducing agent
	   B. Are oxidizing agent
	   C. serve as cathode in comparison cell
	   D. have positive electrode potential
		A. Are reducing agent	**U**	**M**

14	The colour of the universal indicator in basic solution is
	   A. Yellow
	   B. Green
	   C. Orange
	   D. Deep blue
		D. Deep blue	**R**	**M**

15	The oxidation number of Mn in $KMnO_4$is:
	   A. +3
	   B. +5
	   C. +7
	   D. +4
		C. +7	**A**	**D**

16	A heterogeneous system consistof:
	   A. Only one phase
	   B. Three phases
	   C. More than one phase
	   D. Two phases
		C. More than one phase	**U**	**M**

17	In this, electric current produced by an oxidation – reduction reaction
	   A. Standard cell
	   B. voltaic cell
	   C. Reversible cell
	   D. Electrolytic cell
		D. Electrolytic cell	**R**	**E**

18	Among these solutions, this one has the highest pH value: A. 0.01M NaOH	A. 0.01M NaOH	**R**	**E**

	B. 0.02 M HCl C. 0.01M NaHCO$_3$ D. 0.10 M H$_2$SO$_4$			
19	This salt will Hydrolyse in water: A. NaCl B. NH$_4$Cl C. KCl D. Na$_2$SO$_4$	B. NH$_4$Cl	**U**	**M**
20	In electrolytic cell, the anode is the electrode where A. Oxidation occurs B. Reduction occurs C. Both oxidation and reduction occurs D. Neutralization occurs	A. Oxidation occurs	**R**	**E**
21	The number of gram moles of solute in 1 dm^3 of solution is A. Normality B. Molarity C. Mole fraction D. Molality	B. Molarity		
22	The colour of universal indicator in neutral solution is A. Red B. Green C. Blue D. Pink	B. Green		
23	The oxidation number of Oxygen in hydrogen peroxide is A. +2 B. -2 C. +1 D. -1	D. -1		
24	The range of pH is A. 1- 10 B. 0 – 20 C. 1 – 100 D. 0- 14	D. 0- 14		
25	In electrolytic cell cathode is A. Negative B. Positive C. Neutral D. None of these	A. Negative		
26	An electrochemical cell is based upon A. Acid-Base reaction B. Redox reaction C. Oxidation reaction D. Reduction reaction	B. Redox reaction		
27	If 200cm^3 of 1M solution is diluted upto 200cm^3, its molarity will be A. 10M B. 0.2M C. 0.1M D. 1M	C. 0.1M		
28	The oxidation number of S in H$_2$SO$_4$ is A. +6	A. +6		

	B. 10 C. +4 D. Zero			

29	What is POH of a solution whose PH is 8
	  A. 6
	  B. 10
	  C. 4
	  D. 2
		A. 6		

30	The oxidation number of I in KIO_3 is
	  A. -1
	  B. +1
	  C. +3
	  D. +5
		D. +5		

S#	MCQ'S MATERIAL	KEY	CL	DL
	CHAPTER # 8 CHEMICAL KINETICS			

1	A powdered solid is more reactive than its chunks due to its
	  A. Higher temperature
	  B. Greater volume
	  C. Greater surface area
	  D. Low temperature
		C. Greater surface area	**R**	**E**

2	The reaction $2NO_2$ -----□ $2NO + O_2$ is of :
	  A. Zero order
	  B. first order
	  C. second order
	  D. Third order
		C. second order	**R**	**E**

3	For a reversible reaction, If the concentrations of reactants are doubled, then the equilibrium constant will :
	  A. also be doubled
	  B. Be halved
	  C. Remain the same
	  D. Become one-fourth
		C. Remain the same	**U**	**M**

4	They have low values of activation energy
	  A. Slow reactions
	  B. Fast reactions
	  C. Moderate reactions
	  D. Ionic reactions
		B. Fast reactions	**R**	**M**

5	Rate= $K[NH_3]^2$. Keeping all the conditions same, if concentration of NH_3 is increased by four times, then the initial rate of reaction X will be:
	  A. 2X
	  B. 4X
	  C. 8X
	  D. 16X
		D. 16X	**A**	**M**

6	Photochemical reactions, which proceed only under the influence of light, are of the order:
	  A. Zero
	  B. First
	  C. Second
	  D. Third
		A. Zero	**R**	**D**

7	This chemical method is used to determining the rate of	D. Hydrolysis	**A**	**M**

	reaction:
	  A. Physical method
	  B. Colorimetric method
	  C. Polari metric method
	  D. Hydrolysis			

8	Reactions with high activation energy
	  A. Are slow
	  B. Are fast
	  C. Are moderate
	  D. Do not occur
		A. Are slow	**A**	**E**

9	The change of concentration of reacting substance in a unit time is
	  A. Rate of reaction
	  B. Rate constant
	  C. Rate law
	  D. Velocity constant
		A. Rate of reaction	**U**	**M**

10	The addition of a catalyst in a reaction changes
	  A. Internal energy
	  B. Activation energy
	  C. Threshold energy
	  D. Gibbs free energy
		B. Activation energy	**R**	**E**

11	The active masses of reacting substances means
	  A. $mole/dm^3$
	  B. gm/dm^3
	  C. mol/cm^3
	  D. gm/cm^3
		A. $mole/dm^3$	**A**	**D**

12	The energy profile diagram for an exothermic reaction is shown below in which reactant is 15 J and energy at Point B is 40 J .The energy of activation of this reaction is
	  A. 15 J
	  B. 25J
	  C. 40 J
	  D. 55 J
	
		B. 25J	**U**	**M**

13	These have low values of activation energy
	  A. Slow reactions
	  B. Moderate reactions
	  C. Ionic reactions
	  D. Fast reactions
		D. Fast reactions	**U**	**M**

14	which of the following is best to explain the action of catalyst in speeding up a chemical reaction?
	  A. It increases equilibrium constant of a reaction
	
	  B. It increases kinetic energy of reacting molecules
	  C. it prevents reverse reaction
	  D. It decreases activation energy
		D. It decreases activation energy	**R**	**M**

15	Which of the following are best to explain the rapid increase in the rate of a chemical reaction as the temperature rises
	  A. The collision frequency of molecule increases
	  B. The collision became more violent
	  C. Higher proportion of molecules has the necessary minimum energy to react
		C. Higher proportion of molecules has the necessary minimum energy to react	**A**	**D**

	D. Bond breaking becomes easy			
16	The energy of activation for the reaction $2H_2O_2$ -------- $\square$ $2H_2O$ + O_2 in absence of catalyst is 75 KJ/mol the most likely value for the energy of activation in presence of catalyst is: A. 53 KJ/mol B. 75 KJ/mol C. 98 KJ/mol	A. 53 KJ/mol	**U**	**M**
17	The acid catalysed reaction of an organic compound propanone (CH_3COCH_3) with iodine may be represented by the equation CH_3COCH_3 + I_2 -------$\square$ CH_2ICOCH_3 +H^+ + I^- Other conditions remaining same, what will be the effect of initial rate if the concentration of propanone , iodine and acid all are doubled A. 2x B. 4x C. 6x D. 8x	B. 4x	**R**	**E**
18	The decomposition of Dinitrogen pentoxide in a suitable solvent may be represented by the equation $2N_2O_5$ --------$\square$ $4NO_2$ + O_2 The measurement of which are of the following physical quantities could not be used to determine the rate of this reaction: A. Volume of oxygen evolved B. Pressure of oxygen evolved C. Electrical conductivity of solution D. Mass of reacting mixture	C. Electrical conductivity of solution	**R**	**E**
19	Which of the following statements for the reaction between H_2 and Cl_2 in presence of sunlight is correct? A. Rate = K [H_2] [Cl_2] B. The light lowers the energy of activation C. Rate is independent of of concentration of Hydrogen and Chlorine	C. Rate is independent of of concentration of Hydrogen and Chlorine	**U**	**M**
20	Rate constant of a reaction depends upon: A. Temperature B. Initial concentration of reactants C. Time of reaction D. Extent of reaction	A. Temperature	**R**	**E**

1. **Constructed Response Questions (CRQs)**

HOW TO ATTEMPT CRQs:

- Write the answer to each Constructed Response Question/ERQs in the space given below it.
- Use black pen/pencil to write the responses. Do not use glue or pin on the paper.