### [2]

# UNIVERSITY Knowledge is Power

Q.1

#### Enrollment No.....

## Faculty of Engineering End Sem (Odd) Examination Dec-2017 EN2BS05 Chemistry-I

Programme: Diploma Branch/Specialisation: All

Duration: 3 Hrs. Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

-		ten in full inste		b, c or d.	C13 O1
i.	The total nu number n=3 i		al associated	with principal quantum	1
	(a) 4	(b) 9	(c) 16	(d) 25	
ii.	According to	n+l rule, ele	ctrons will f	irst fill in which of the	1
	following orb	oital.			
	(a) 4s	(b) 3d	(c) 3p	(d) 3s	
iii.	Corrosion in	iron is called			1
	(a) Rusting	(b) Tarnishin	g (c) Cupellin	ng (d) Poling	
iv.	Corrosion tak	tes place at			1
	(a) Anodic ar	rea	(b) Cathodi	c area	
	(c) Neutral ar	ea	(d) All the	above	
v.	On passing of	electricity, the	positively cl	nanged ion in a solution	1
	move toward	S			
	(a) Anode	(b) Cathode	(c) Both (a)	and(b) (d) None of these	
vi.	The following	g combination	form an acidi	c buffer	1
	(a) Acetic acid/sodium acetate				
	(b) Ammoniu	ım hydroxide/a	mmonium ch	loride	
	(c) Both (a) and (b)				
	(d) None of the	hese			
vii.	The minimum pressure required to liquefy the gas at the critical				
	temperature i				
	(a) Critical pr		• •	heric pressure	
	(c) Partial pro		(d) None of		1
viii.	"The equal volume of all gases under the same condition of				
		and pressure co	ontains equal	number of molecules" is	
	stated by				
				P.T	Г.О.

		(a) Charle's law	(b) Boyle's la	ıW	
		(c) Avagadro's law	(d) All of thes	e	
	ix.	Beer-Lamberts law states tha	t		1
		(a) $A=\varepsilon cl$ (b) $A=\varepsilon/cl$	(c) A=cl	(d) A=l	
	х.	Separation of constituents of	gases can be c	arried out using	1
		(a) IR spectroscopy	(b) UV spectr	roscopy	
		(c) GC	(d) None of the	nese	
Q.2	i.	State Pauli's exclusion princi	ple.		2
	ii.	Explain n+l rules with an exa	ımple.		3
	iii.	Discuss the study of period reference to: (a)Ionisation	•	lement giving special (b) Electron affinity	5
OR	iv.	Discuss Bohr model of atom and write any one reason for its failure.			
Q.3	i.	Give the effect of alloying of	any two eleme	ents in steel.	4
	ii.	Describe dry corrosion with 6	example.		6
OR	iii.	Discuss with neat diagram the equation involved in it.	he extraction of	of iron from ore. Write	6
Q.4	i.	Define pH value.			2
	ii.	What is buffer solution? Give	e two examples	S.	3
	iii.	State Faraday's laws of electronic	rolysis and give	e its significance.	5
OR	iv.	What is degree of ionisatio degree of ionisation.	n? What are	the factors influencing	5
Q.5	i.	Define critical temperature.			2
	ii.	Write any three postulates of	kinetic theory	of gases.	3
OR	iii.	Derive Van der Waal's gas ee	quation for rea	l gas.	5
	iv.	Explain liquefaction of galabelled diagram	ses by Linde	e's process with neat	5
Q.6	i.	Differentiate absorption and	emission spect	ra.	4
	ii.	Explain the instrumentation	n of UV spe	ectroscopy with block	6
		diagram.			
OR	iii.	Write any two applications of (a)IR (b)NMR (c) GC	f each of the fo	ollowing:	6

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## EN2BS05 Chemistry-I

### **Marking Scheme**

ii. (d) 3s iii. (a) rusting iv. (a) anodic area v. (b) cathode vi. (a) acetic acid/sodium acetate vii. (a) critical pressure viii. (c) Avagadro's law ix. (a) A=εcl x. (c) GC  Q.2 i. Statement ii. Rule - 2 marks Example − 1 mark iii. Explanation for Ionisation potential − 2.5 marks Example − 1 mark iii. Explanation for Electron affinity − 2.5 marks OR iv. Four Postulates − 4 marks Reason - 1 mark  Q.3 i. Effect of each element (2 marks * 2 = 4 marks) ii. Explanation - 4 marks Examples. − 2 marks OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition ii. Definition − 2 marks At least two examples − 1 mark iii. At least two Statements - 3 marks Significance. − 2 marks OR iv. Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition. ii At least three postulates 1 for each (1 mark * 3 = 3 marks)  3 a	Q.1	i.	(b) 9	1
iv. (a) anodic area  v. (b) cathode  vi. (a) acetic acid/sodium acetate  vii. (a) acetic acid/sodium acetate  viii. (a) critical pressure  viii. (c) Avagadro's law  ix. (a) A=\text{scl}  x. (c) GC  1  Q.2 i. Statement  ii. Rule - 2 marks  Example - 1 mark  iii. Explanation for Ionisation potential - 2.5 marks  Explanation for Electron affinity - 2.5 marks  COR iv. Four Postulates - 4 marks  Reason - 1 mark  ii. Explanation - 4 marks  Examples 2 marks  OR iii. Discussion - 3 marks  Diagram - 2 marks  Equation - 1 mark  Q.4 i. Definition  ii. Definition - 2 marks  At least two examples - 1 mark  iii. At least two Statements - 3 marks  Significance 2 marks  OR iv. Definition - 1 mark  Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.		ii.	(d) 3s	1
iv. (a) anodic area       1         v. (b) cathode       1         vi. (a) acetic acid/sodium acetate       1         vii. (a) critical pressure       1         viii. (c) Avagadro's law       1         ix. (a) A=cl       1         x. (c) GC       1         Q.2 i. Statement       2         ii. Rule - 2 marks       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         COR iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         ii. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples 2 marks       6         Diagram - 2 marks       6         Diagram - 2 marks       6         Equation - 1 mark       2         iii. Definition       2         iii. Definition - 2 marks       3         At least two examples - 1 mark       5         iii. At least two Statements - 3 marks       5         Significance 2 marks       5         OR iv Definition - 1 mark       5         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)          Q.5 i Definition.		iii.	(a) rusting	1
vi. (a) acetic acid/sodium acetate       1         vii. (a) critical pressure       1         viii. (c) Avagadro's law       1         ix. (a) A=Ecl       1         x. (c) GC       1         Q.2 i. Statement       2         ii. Rule - 2 marks       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         Explanation for Electron affinity - 2.5 marks       5         OR iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         Q.3 i. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples 2 marks       6         OR iii. Discussion - 3 marks       6         Diagram - 2 marks       6         Diagram - 2 marks       6         Equation - 1 mark       2         ii. Definition - 2 marks       3         At least two Statements - 3 marks       5         Significance 2 marks       5         OR iv Definition - 1 mark       5         Or Definition - 1 mark       5         Or Definition - 1 mark       5          Or Definition - 1 mark       5         Or Def		iv.	- · · ·	1
vii. (a) critical pressure       1         viii. (c) Avagadro's law       1         ix. (a) A=ccl       1         x. (c) GC       1         Q.2 i. Statement       2         ii. Rule - 2 marks       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         Explanation for Electron affinity - 2.5 marks       5         OR iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         Q.3 i. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples 2 marks       6         OR iii. Discussion - 3 marks       6         Diagram - 2 marks       6         Diagram - 2 marks       6         Equation - 1 mark       2         iii. At least two Statements - 3 marks       5         Significance 2 marks       5         OR iv Definition - 1 mark       5         OR iv Definition - 1 mark       5         OB Definition - 1 mark       5         OB Definition - 1 mark       5          OB Definition - 2 marks       1         OB Definition - 3 marks       3         OB Definit		v.	(b) cathode	1
vii.       (a) critical pressure       1         viii.       (c) Avagadro's law       1         ix.       (a) A=εcl       1         x.       (c) GC       1         Q.2       i. Statement       2         ii. Rule - 2 marks       3       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         Explanation for Electron affinity - 2.5 marks       5         OR       iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         Q.3       i. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples - 2 marks       6         Discussion - 3 marks       6         Discussion - 3 marks       6         Diagram - 2 marks       6         Equation - 1 mark       2         ii. Definition - 2 marks       3         At least two Statements - 3 marks       5         Significance - 2 marks       5         OR       iv Definition - 1 mark       5         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)       5		vi.	(a) acetic acid/sodium acetate	1
viii. (c) Avagadro's law       1         ix. (a) A=εcl       1         x. (c) GC       1         Q.2 i. Statement       2         ii. Rule - 2 marks       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         Explanation for Electron affinity - 2.5 marks       5         OR iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         Q.3 i. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples 2 marks       6         OR iii. Discussion - 3 marks       6         Diagram - 2 marks       6         Equation - 1 mark       3         At least two examples - 1 mark       3         iii. Definition - 2 marks       5         Significance 2 marks       5         OR iv Definition - 1 mark       5         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)         Q.5 i Definition.       2		vii.	(a) critical pressure	1
ix. (a) A=εcl       1         x. (c) GC       1         Q.2 i. Statement       2         ii. Rule - 2 marks       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         Explanation for Electron affinity - 2.5 marks       5         OR iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         Q.3 i. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples 2 marks       6         OR iii. Discussion - 3 marks       6         Diagram - 2 marks       6         Equation - 1 mark       3         At least two examples - 1 mark       3         iii. Definition - 2 marks       5         Significance 2 marks       5         OR iv Definition - 1 mark       5         OR iv Definition - 1 mark       5         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)		viii.	•	1
x.       (c) GC       1         Q.2       i. Statement       2         ii. Rule - 2 marks       3         Example - 1 mark       3         iii. Explanation for Ionisation potential - 2.5 marks       5         CR       iv. Four Postulates - 4 marks       5         Reason - 1 mark       5         Q.3       i. Effect of each element (2 marks * 2 = 4 marks)       4         ii. Explanation - 4 marks       6         Examples 2 marks       6         Diagram - 2 marks       6         Diagram - 2 marks       6         Equation - 1 mark       3         Q.4       i. Definition       2         ii. Definition - 2 marks       3         At least two examples - 1 mark       5         iii. At least two Statements - 3 marks       5         Significance 2 marks       5         OR       iv Definition - 1 mark       5         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)       2		ix.	. , , , ,	1
ii. Rule - 2 marks Example - 1 mark iii. Explanation for Ionisation potential - 2.5 marks Explanation for Electron affinity - 2.5 marks OR iv. Four Postulates - 4 marks Reason - 1 mark  Q.3 i. Effect of each element (2 marks * 2 = 4 marks) Explanation - 4 marks Examples 2 marks OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition ii. Definition - 2 marks At least two examples - 1 mark iii. At least two Statements - 3 marks Significance 2 marks OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.		х.	` '	1
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Example – 1 mark  iii. Explanation for Ionisation potential – 2.5 marks  Explanation for Electron affinity – 2.5 marks  OR iv. Four Postulates – 4 marks  Reason – 1 mark   Q.3 i. Effect of each element (2 marks * 2 = 4 marks)  Explanation – 4 marks  Examples. – 2 marks  OR iii. Discussion – 3 marks  Diagram – 2 marks  Equation – 1 mark   Q.4 i. Definition  ii. Definition – 2 marks  At least two examples – 1 mark  iii. At least two Statements – 3 marks  Significance. – 2 marks  OR iv Definition – 1 mark  Factors involved (four) – 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	Q.2			
iii. Explanation for Ionisation potential – 2.5 marks Explanation for Electron affinity – 2.5 marks  OR iv. Four Postulates – 4 marks Reason - 1 mark  Q.3 i. Effect of each element (2 marks * 2 = 4 marks) Explanation - 4 marks Examples. – 2 marks  OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 ii. Definition iii. Definition 2 iii. Definition – 2 marks At least two examples – 1 mark iii. At least two Statements - 3 marks Significance. – 2 marks OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.		ii.		3
Explanation for Electron affinity – 2.5 marks  OR  iv. Four Postulates – 4 marks Reason - 1 mark  Q.3  i. Effect of each element (2 marks * 2 = 4 marks) Explanation - 4 marks Examples. – 2 marks OR  iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4  i. Definition ii. Definition – 2 marks At least two examples – 1 mark iii. At least two Statements - 3 marks Significance. – 2 marks OR  iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5  i Definition.			<u>.</u>	_
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Reason - 1 mark  Q.3 i. Effect of each element (2 marks * 2 = 4 marks)  ii. Explanation - 4 marks Examples 2 marks OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition ii. Definition - 2 marks At least two examples - 1 mark iii. At least two Statements - 3 marks Significance 2 marks OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	OR	iv		5
ii. Explanation - 4 marks Examples 2 marks OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition ii. Definition - 2 marks At least two examples - 1 mark iii. At least two Statements - 3 marks Significance 2 marks OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	OIC	14.		
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Examples. – 2 marks  OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition ii. Definition – 2 marks At least two examples – 1 mark iii. At least two Statements - 3 marks Significance. – 2 marks OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	Q.3	1.		
OR iii. Discussion - 3 marks Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition ii. Definition - 2 marks At least two examples - 1 mark iii. At least two Statements - 3 marks Significance 2 marks OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.		ii.	1	6
Diagram - 2 marks Equation - 1 mark  Q.4 i. Definition  ii. Definition - 2 marks At least two examples - 1 mark  iii. At least two Statements - 3 marks Significance 2 marks  OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	ΩP	;;;	<u>.</u>	6
Equation - 1 mark  Q.4 i. Definition  ii. Definition - 2 marks  At least two examples - 1 mark  iii. At least two Statements - 3 marks  Significance 2 marks  OR iv Definition - 1 mark  Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	OK	1111.		U
<ul> <li>ii. Definition - 2 marks         At least two examples - 1 mark         iii. At least two Statements - 3 marks             Significance 2 marks         OR         iv Definition - 1 mark         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)</li> <li>5</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>9</li> <li>1</li> <li>1</li> <li>2</li> <li>2</li> </ul>				
<ul> <li>ii. Definition - 2 marks         At least two examples - 1 mark         iii. At least two Statements - 3 marks             Significance 2 marks         OR         iv Definition - 1 mark         Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)</li> <li>5</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>9</li> <li>1</li> <li>1</li> <li>2</li> <li>2</li> </ul>	0.4	:	To C 111	2
At least two examples – 1 mark  iii. At least two Statements – 3 marks  Significance. – 2 marks  OR  iv Definition - 1 mark  Factors involved (four) – 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.	Q.4			
iii. At least two Statements - 3 marks Significance 2 marks  OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  5 Q.5 i Definition.		11.		3
OR iv Significance. – 2 marks Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.		iii	<u> •</u>	5
OR iv Definition - 1 mark Factors involved (four) - 4 marks (1 mark * 4 = 4 marks)  Q.5 i Definition.		111.		
Q.5 i Definition. 2	ΩD	iv	E	5
	UK		Factors involved (four) - 4 marks (1 mark * $4 = 4$ marks)	
	0.5	i	Definition	2

OR	iii	Derivation	5
	iv	Explanation - 3 marks	5
		Diagram – 2 marks	
Q.6	i.	At least two difference (2 marks * 2 = 4 marks)	4
	ii.	Block diagram – 3 marks	6
		Explanation – 3 marks	
OR	iii.	Two application 3 marks for each (3 marks $*2 = 6$ marks)	6

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