

**Marathwada Institute of Technology, Aurangabad**

Department of Basic Sciences and Humanities

QUESTION BANK

Title of the Subject: BTBS 202 - Engineering Chemistry	
Title of the Unit: Water Treatment	Unit No:- I

Multiple Choice Questions		
Question No.	Question Description	Expected Marks
1	Hardness of water is due to mainly ____ & ____ salts. a) Carbonate & Non carbonate b) Zinc & Iron c) Nitrates & Sulphates d) Calcium & Magnesium	1
2	Salt causing _____ hardness are treated by Soda. a) Non carbonate b) Temporary c) Permanent d) All of the above	1
3	Cation Exchange Resins are regenerated by _____. a) Hot Solution b) Cold Solution c) Buffer Solution d) Acidic Solution	1
4	EDTA method used to determine hardness of water is a _____. a) Redox Titration b) Precipitation Titration c) Complexometric Titration d) Acid – Base Titration.	1
5	Temporary hardness can be removed by _____. a) Boiling b) Filtration c) Sedimentation d) Addition of Na ₂ CO ₃ .	1
6	Zeolite Exchanger has ability to replace Calcium ions by _____. a) Magnesium ions b) Hydroxyl ions c) Hydrogen ions d) Sodium ions	1
7	In the determination of hardness of water by EDTA method, M-EDTA Complex formed is stable at pH _____. a) 4 b) 7 c) 10 d) 13	1

8	Cation Exchange Resin has functional group _____. a) $-\text{SO}_3\text{H}$ b) $-\text{CH}_3$ c) $-\text{SO}_4$ d) $-\text{Nme}_3\text{OH}$	1
9	If total hardness of water is 280 ppm and noncarbonate hardness is 180 ppm then Permanent hardness is of – a) 460 ppm b) 100 ppm c) 180 ppm d) 280 ppm	1
10	M-EBT Complex is _____. a) Blue coloured b) Wine red coloured c) pink coloured d) Colourless	1

Short Answer Question

Question No.	Question Description	Expected Marks
1	Define hardness of water.	2
2	Name the salts responsible for hardness of water.	2
3	Differentiate between permanent hard water and temporary hard water.	2
4	How hard water is not useful in industries?	2
5	What happens when temporary hard water is boiled? Explain with reactions	2
6	Explain the Principle of EDTA method.	2
7	Why buffer solution is used during estimation of hardness of water by EDTA method?	2
8	Draw the structure of M-EDTA Complex.	2
9	How zeolites are regenerated? Explain with reaction.	2
10	What are advantages of Lime Soda Process of softening?	2

Long Answer Question

Question No.	Question Description	Expected Marks
1	Explain Zeolite process of softening of water with well labeled diagram.	6
2	Explain ion exchange process of softening of water	6
3	How hardness of water is removed by Lime Soda Process of softening?	6

4	Explain determination of hardness of water by EDTA method.	6
5	Explain the determination of Dissolved Oxygen by Iodometric method.	6
6	What are the types of water? Explain the method to remove the temporary hardness.	6



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QUESTION BANK

Title of the Subject: BTBS 202 - Engineering Chemistry	
Title of the Unit: Phase Rule	Unit No:- II

Multiple Choice Questions		
Question No.	Question Description	Expected Marks
1	Which of the following term is used to express the Gibb's phase rule equation? a. Degrees of Freedom b. Component c. Phase d. All of the above.	1
2	Reduced phase rule equation is applied to a. Water system b. Sulphur system c. Ag-Pb system d. none of the above .	1
3	The phase diagram of Sulphur has _____triple points. a. Two b. Three c. One d. Four	1
4	The correct phase rule equation for Ag- Pb system is _____ a. $F = C - P + 2$ b. $F = C - P + 1$ c. $F = 3 - P$ d. None of the above	1

5	Solution of a substance in a solvent consists of _____ no. of phases. a. One b. Two c. Three d. Four	1
6	In phase diagram of Single Component system along the curve, ____ phases exists in equilibrium. a. All b. None c. Two d. All the above	1
7	In phase diagram of Two Component system, the system is nonvariant at _____ point. a. Triple b. Eutectic c. Boiling d. Melting	1
8	Mixture of gases has _____ Degrees of Freedom.	1
9	Two solids constitute _____. a. Same phase. B. Different Phase c. single phase d. None of the above	1
10	What is the critical temperature of water system? a. 374°C b. 210°C c. 204°C d. 200°C	1

Short Answer Question

Question No.	Question Description	Expected Marks
1	Write the Phase Rule Equation and explain the term Phase.	2
2	Explain the term Component and Degree of Freedom in phase rule with an example	4
3	Explain the Reduced Phase Rule Equation.	4

Long Answer Question

Question No.	Question Description	Expected Marks
1	Draw the phase diagram for Water System and explain area, curves, lines and triple points of phase diagram.	6
2	Explain single component Sulphur System with phase diagram.	6
3	Explain Two-Component Silver-Lead System with phase diagram.	6



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QUESTION BANK

Title of the Subject: BTBS 202 - Engineering Chemistry	
Title of the Unit: Metallurgy	Unit No:- III

Multiple Choice Questions		
Question No.	Question Description	Expected Marks
1	Bauxite is an ore of _____. a. Iron b. Copper c. Zinc d. Aluminium	1
2	Chemical formula for Galena is _____. a. ZnS b. AgS c. FeS d. PbS	1
3	Chemical formula for Pitch Blend is _____. a. KCl. MgCl ₂ .6H ₂ O b. U ₃ O ₈ c. Al ₂ O ₃ d. MnO ₂	1
4	Coal is used as _____ in metallurgy. a. Catalyst b. Accelerator c. Reducing agent d. Oxidizing agent	1
5	Which of the following is a method of refining of metal? a. Crushing and Grinding b. Gravity separation c. Calcination d. Electrolytic refining.	1
6	In concentration of ore, the common froth forming agent used is – a. NaCN b. K ₂ CO ₃ c. Al ₂ O ₃ d. K ₂ Cr ₂ O ₇	1

7	Calcination and Roasting is done in _____ during concentration of ore. a. Reverberatory Furnace b. Blast Furnace c. Muffle Furnace d. All of the above.	1
8	Roasting is preferred method for concentration of _____ ores. a. Sulphide b. Oxide c. Sulphate d. Halide	1
9	The substance used to remove gangue from ore is – a. Slag b. Composite c. Flux d. Matrix	1
10	_____ is used as water repellent in froth floatation method of concentration of ore. a. Pine Oil b. Ethyl Alcohol c. Ethyl Xanthate d. Wax.	1

Short Answer Question

Question No.	Question Description	Expected Marks
1	What is Refining? Why it is necessary?	2
2	What is the principle of electrolytic refining of metal?	2
3	Explain the Gravity Separation Method for physical Concentration of ore.	2
4	Define Roasting and Calcination process of concentration of ores.	2
5	Explain the electrolytic refining of metal with suitable example	4
6	Explain occurrence and types of Ores.	4
7	Discuss smelting process involved in Metallurgy.	4

Long Answer Question

Question No.	Question Description	Expected Marks
1	What is concentration of ore ? Explain the Gravity separation method for physical concentration of ore.	6
2	What is smelting? Explain the process of isolation of metals by Pyrolysis.	6
3	Explain the Froth floatation and Magnetic separation method of ore dressing.	6

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QUESTION BANK

Title of the Subject: BTBS 202 - Engineering Chemistry	
Title of the Unit: Fuels and Lubricants	Unit No:- IV

Multiple Choice Questions		
Question No.	Question Description	Expected Marks
1	Heat capacity of a combustible fuel is measured by its _____ value. a. Specific heat b. Calorific c. Combustibility d. None of the above	1
2	A good fuel has ____ calorific value and _____ ignition point. a. High, High b. High, Low c. Moderate , High d. High, moderate.	1
3	The relation between GCV and NCV values of the same fuel shows _____ a. $NCV < GCV$ b. $NCV > GCV$ c. Sometimes GCV is higher d. Sometimes NCV is higher.	1
4	Before refining of petroleum, Sulphur is removed from crude oil by treating it with _____ a. Copper oxide b. Calcium oxide c. Aluminium oxide d. Chromium	1
5	A coal with fibrous structure is _____. a. Lignite b. Anthracite c. Bituminous d. Peat.	1
6	Lubricant reduces _____ when applied to machine parts. a. Wear & tear b. Friction c. Maintenance cost d. All of above	1
7	The property of any liquid to resist its own flow is known as – a. Resistivity b. Viscosity c. flow d. All of above.	1
8	When Graphite is dispersed in oil , it is known as –	1

	a. Grease b. Blended oil c. Oil-dag d. Compounded oil	
9	Cloud point indicates _____temperature up to which lubricant is in oil form. a. Highest b. Exact c. Average d. Lowest	1
10	Oil mixed with additives is called as _____. a. Mixture b. Oil -dag c. Aqua- dag d. Blended oil	1
11	If the viscosity of oil falls rapidly as temp. is raised , it has a) Low VI b) High VI	

Short Answer Question

Question No.	Question Description	Expected Marks
1	List different types of the coal.	2
2	What is calorific value? Mention its unit.	2
3	Define Lubricants and Lubrication.	2
4	Define the term Oildag and Aquadag.	2
5	Define viscosity and viscosity index.	2
6	Define the terms : Surface tension, Flash point, Fire point, Acidity , Saponification	Each for 1 mark
7	What are the types of the fuels? Explain with example.	4
8	Explain characteristics of Good Fuel.	4
9	Distinguish between solid and gaseous fuels.	4
10	Why analysis of coal is necessary.	4

Long Answer Question

Question No.	Question Description	Expected Marks
1	Explain the Proximate analysis of coal with its importance.	6
2	Explain the Ultimate analysis of coal with its importance.	6
3	Explain the process of Refining of Petroleum.	6

4	Explain briefly the classification of Lubricants.	6
5	What is viscosity? How viscosity get affected by Temperature?	6



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QUESTION BANK

Title of the Subject: BTBS 202 - Engineering Chemistry	
Title of the Unit: Electrochemistry	Unit No:- V

Multiple Choice Questions		
Question No.	Question Description	Expected Marks
1	A cell constant is the ratio of a) specific conductance to observed conductance b) observed conductance to specific conductance. c) specific conductance to molar conductance. d) None of these.	1
2	The specific conductance of the 0.1 N KCl solution is $0.0034 \text{ mhos cm}^{-1}$ and observed conductance is 0.005 mhos measured by a particular conductivity cell. The cell const of the cell will be ka) 0.86 cm^{-1} b) 0.68 cm^{-1} c) 8.6 cm^{-1} d) 6.8 cm^{-1}	1
3	On dilution the specific conductance of an electrolyte - a) Increases b) Decreases	1
4	Equivalent conductivity is---- a. $1000 \times k/N$ b. $1000 * N/k$ c. $k * N/1000$ d. None of above	1

5	<p>Electrolyte can conduct electricity, because:</p> <p>a) Their molecules contain unpaired electrons, which are mobile</p> <p>b) Their molecules contain loosely held electrons, which become free under the influence of voltage.</p> <p>c) The molecules break up into ions, when a voltage is applied.</p> <p>d) The molecules are broken up into ions, when the electrolyte is fused or dissolved in the solvent.</p>	1
6	<p>Conductivity of solution is directly proportional to</p> <p>a) Dilution b) Number of ions c) Current density d) Volume of the solution.</p>	1
7	<p>1. The reciprocal of specific resistivity is called as</p> <p>a) specific conductivity</p> <p>b) Molar conductivity</p> <p>c) equivalent conductivity</p> <p>d) None</p>	1
8	<p>Which one of the following is an electrolyte?</p> <p>a) C₆H₆ b) CHCl₃ c) C₆H₅Cl d) NaCN</p>	1
9	<p>Glass electrode is used as an indicator electrode in ----</p> <p>a. Potentiometry b. conductrometry c. pHmetry Colorimetry</p>	1
10	<p>In glass electrode, at glass membrane sensitive to hydrogen ions is made from---</p> <p>a. Soft glass b. Tough glass c. Borosilicate glass d. Silicate glass.</p>	1
Short Answer Question		

Question No.	Question Description	Expected Marks
1	Define the terms Specific Resistance , Specific Conductance, Equivalent conductance and Molar conductance with its unit.	Each for 2 marks
2	Define cell constant. Mention its unit.	2
3	How to measure the conductance of an electrolyte by Wheatstone bridge.	4
4	State Debye-Huckel theory of strong electrolyte.	2
5	State the principle of Conductometric titrations	2
6	Explain the conductometric titration of Strong Acid Vs Strong Base with an example.	4
7	Explain Ostwald's theory of Acid – Base Indicator.	4
8	Explain the Quinoid theory of Acid –Base Indicator.	4

Long Answer Question		
Question No.	Question Description	Expected Marks
1	State Ohm's law. Define the terms Specific Resistance , Specific Conductance, Equivalent conductance and Molar conductance with its unit.	6
2	Explain the Debye-Huckle Theory of Strong Electrolyte.	6
3	Write a note on conductometric titrations .	6
4	Explain the construction and working of glass electrode with its advantages.	6