D Y Patil College of Engineering, Akurdi, Pune
Office of Dean Academics
AY: 2020-21, SEM - I
Subject Name: - Engineering Chemistry
MCQ bank
Unit 1 & 2

Q. No.	CO	PO	BT	Question	Correct Option	Mark
1	1	1	1	Biocarbonate alkalinity of water is determined by using indicator 1.Methyl orange 2. Phenolphthalein 3.Phenol red 4.Cresol red	1	1
2	1	1	1	Determination of Alkalinity is a titration known as ____ 1.Precipotation 2.Redox 3.Complexometric 4. Acid-Base	4	1
3	1	1	2	Hardness of water is its ____ 1.Soap releasing capacity 2.Soap foaming capacity 3.Soap consuming capacity 4.Soap dissolving capacity	2	1
4	1	1	1	Hydroxide alkalinity of water is determined by using indicator 1.Methyl orange 2. Phenolphthalein 3.Phenol red 4.Cresol red	2	1
5	1	1	2	If P=M, then alkalinity of water is due to ions____ 1.OH^- 2.HCO_3^- 3.CO_3^{-2} 4.OH^- and CO_3^{-2}	1	1
6	1	1	2	In EDTA titration, the addition of buffer solution maintains___ 1.Alkalinity 2.Acidity 3.pH 4.Neutrality	4	1
7	1	1	2	In the determination of hardness of water by EDTA method, buffer added is of pH ___- 1.9 2.8 3. 12 4. 10	4	1
8	1	1	2	In the determination of hardness of water, Na2EDTA is preferred instead of EDTA because _____ 1.EDTA is volatile 2. EDTA is very cheap 3.EDTA is colourless 4.EDTA is partially soluble in water	4	1
9	1	1	1	Metal – EBT complex is ___ 1.Blue colour 2.Wine red colour	2	1

				3.Pink colour 4.Colourless		
10	1	1	1	Permanent hardness is also known as ____ 1.carbonate hardness 2.Non-carbonate hardness 3.Total hardness 4.none of above	2	1
11	1	1	1	The colour of metal-EDTA complex is ___- 1.Blue 2.Wine red 3.Pink 4.Colourless	4	1
12	1	1	1	Hardness of water is accurately determined by titration against ____ 1.Std. $AgNO_3$ solution 2.Std. EDTA solution 3.Std. $KMnO_4$ solution 4. Std.H_2SO_4 solution	2	1
13	1	2	2	If water has 380ppm hardness then it has _____ 1.38 mg of Ca salts in 1 lit. 2. 380 mg of Ca salts in 1 lit 3. 380 mg of $CaCO_3$ equivalents in 1 lit. 4. 38 mg of $CaCO_3$ equivalents in 1 lit.	3	1
14	1	1	2	$Mg(HCO_3)_2$ on boiling forms ____ 1.$MgCO_3 + CO_2 + H_2O$ 2. $MgCO_3 + CO_2$ 3.$Mg(OH)_2 + 2CO_2$ 4. $Mg(OH)_2 + H_2CO_3$	3	1
15	1	1	1	Permanent hardness in water is caused by ____ 1. $MgCO_3$ 2. $CaCO_3$ 3. $CaSO_4$ 4. $Mg(HCO_3)_2$	3	1
16	1	1	2	Temporary hardness in water is removed by ____ 1.Sedimentation 2.Filtration 3. Addition of Na_2CO_3 4.Boiling	4	1
17	1	1	2	$MgCO_3$ is dissolve in water on boiling is converted to ppt. of _____ 1.MgO 2. $Mg(OH)_2$ 3. $Mg(HCO)_2$ 4.MgO.OH	2	1
18	1	1	2	On boiling hard water, temporary hardness is removed by forming precipitates of_____ 1. Calcium and Magnesium Chloride 2. Calcium and Magnesium Carbonate 3. Calcium carbonate and Magnesium hydroxide 4. Calcium hydroxide and Magnesium carbonate	3	1
19	1	1	2	$Ca(HCO_3)_2$ imparts _____ to water 1.Hardness 2.Alkalinity 3.Both 1 & 2 4. None of these	3	1
20	1	1	2	Hardness of water for industrial use of water, should be ___-	1	1

				1.Balow 10ppm $CaCO_3$ equivalent 2. 100-200 ppm $CaCO_3$ equivalent 3. 200-300 ppm $CaCO_3$ equivalent 4. None of these		
21	1	1	1	Permanent hardness in water is caused by ____ 1. $MgCO_3$ 2. $CaCO_3$ 3. $CaSO_4$ 4. $Mg(HCO)_2$	3	1
22	1	1	1	A soap is chemically ____ 1.Ester of fatty acid 2.Calcium salt of fatty acid 3.Sodium salt of fatty acid 4.Mixture of ester and salt of fatty acid	3	1
23	1	1	2	In the determination of hardness of water by EDTA method, the end point is ____ 1.Pink to colourless 2.Blue to win red 3.Yellow to orange 4.Wine red to blue	4	1
24	1	1	2	EDTA has ___ reactive site for coordination 1. Four2. Six 3. Three 4. Five	2	1
25	1	1	2	The role of adding buffer solution of pH 9 to 10 in the titration mixture during titration of hard water EDTA is ____ 1.To note the end point colour 2. To neutralize the acidic hard water sample 3.Helps the reaction during titration 4.to maintain the required pH which may change due to formation of acid during titration reaction.	4	1
26	1	1	1	Soft water + buffer (pH10) + indicator (EBT) developes ____colour 1.Orange 2.Colourless 3.Blue 4.Wine red	3	1
27	1	2	3	If P > ½ M, then alkalinity of water is due to ions ____ 1.OH^- 2. HCO_3^- 3.CO_3^{-2} and HCO_3^- 4. OH^- and CO_3^{-2}	4	1
28	1	2	3	If P < ½ M, then alkalinity of water is due to ions ____ 1. OH^- 2. HCO_3^- 3.CO_3^{-2} and HCO_3^- 4. OH^- and CO_3^{-2}	3	1
29	1	1	2	Which ions cannot remain together in an alkalinity water sample ____ 1. OH^- and CO_3^{-2} 2. OH^- and HCO_3^- 3. CO_3^{-2} and HCO_3^- 4. All of these	2	1
30	1	1	2	An alkaline water sample during titration against strong acid, gets completely neutralized when pH of titration mixture is _____	2	1

				1. 7.0 2. 8.3 3. 4.3 4. 6.5		
31	1	1	2	Alkalinity in water cannot be due to_____ 1. –OH, HCO_3^{-1} together 2. –OH,CO_3^{-2} together 3. CO_3^{-2},HCO_3^{-1} together 4. HCO_3^{-1} only	1	1
32	1	1	1	When water sample is titrated with standard acid using phenolphthalein indicator, the end point corresponds to _____. 1. complete neutralization of OH^- only 2. complete neutralization of CO^2_3 3. complete neutralization of OH- and half neutralization of CO_3^{-2} 4. complete neutralization of OH-,and HCO_3^{-1}	3	1
33	1	2	2	If for a water sample P=0, then the water sample contains alkalinity type is _____. 1. Only –OH 2. Only CO_3 3. –OH and CO_3^- 4. Only HC_3^-	4	1
34	1	1	2	Match the following : 1 P=0 P OH^- 2 P=M Q zeolite 3 NaCl R Alkalinity 4 NaOH S HCO^{-3} 1)1-S,2-R,3Q,4-P 2)1-R,2-Q,3-P,4-S 3)1-B,2-R,3-P,4-Q 4)1-S,2-P,3-Q,4-R	4	1
35	1	1	2	Match the following : 1 $CA(HCO_3)_2$ P OH^- 2 $CaCO_3$ Q Foaming 3 Oil droplets R Scale 4 Wet steam S Temporary hardness 1)1-S,2-R,3-Q,4-P 2)1-,2-Q,3-P,4-S 3)1-S,2-R,3-P,4-Q 4)1-S,2-P,3-Q,4-R	1	1
36	1	2	3	5.85g of NaCl has $CaCO_3$ equivalence as _____ 1) 5 x 10^1mg 2)5 x 10^2 mg 3)5 x 10^3 mg 4)5 x 10^4mg	3	2
37	1	2	3	A water sample has hardness of 280mg/l. After boiling the hardness of water is reduced by 40mg/l, then the permanent hardness of water is _____. 1.24 ppm 2. 320ppm 3. 240ppm 4. 32ppm	3	2
38	1	2	3	Amount of NaCl in 100 litres of 12% brine solution is _____mg of NaCl. 1. 12 x 10^5 2. 1.2 x 10^5 3. 120 x 10^5 4. 0.12 x 10^5	1	2
39	1	2	3	If the water sample contains $Mg(NO_3)_2$ = 75 ppm of $CaCO_3$ eq	c	2

				$CaSO_4$ = 60 ppm of $CaCO_3$ eq $CaCO_3$ = 35 ppm of $CaCO_3$ eq SiO_2 = 225 ppm NaCl = 500 ppm $AlCl_3$ = 2000 pm It's total hardness is __ a. 107 ppm b. 2275 ppm c. 170 ppm d. 2725 ppm		
40	1	2	2	If the water sample contains CaCO3 = 35 ppm of $CaCO_3$ eq Ca(HCO3)2 = 70 ppm of $CaCO_3$ eq KCl = 15 ppm It's permanent hardness is __ a. 105 ppm b. 70 ppm c. 50 ppm d. none of these	d	2
41	1	1	1	Which type of ligand is EDTA? a. tridentate ligand b. bidentate ligand c. hexadentate ligand d. monodentate ligand	c	1
42	1	1	1	Unit of hardness of water is __ a. ppm b. ppb c. mg/lit d. all of them	d	1
43	1	2	3	In determination of alkalinity using dual indicator method, if P = 0, HCO_3^- alkalinity is equal to __ a. 2P b. M c. M-2P d. 2P-M	b	1
44	1	2	3	In determination of alkalinity using dual indicator method, if P = M, OH^- alkalinity is equal to __ a. 2P - M b. M – 2P c. 0 d. non of these	b	1
45	1	1	2	A water sample contains 10 mg each of $Mg(NO_3)_2$, Fe_2O_3, $MgCl_2$ and $Mg(HCO_3)_2$. The following salt does not contribute to hardness __ a. $Mg(NO_3)_2$	b	1

				b. Fe_2O_3 c. $MgCl_2$ d. $Mg(HCO_3)_2$		
46	1	2	1	Which of the following is not a result of the excess of impurity in boiler-feed? a) Scale and sludge formation b) Decomposition c) Corrosion, priming and foaming d) Caustic embrittlement	b	1
47	1		1	If the precipitate formed is soft, loose and slimy, these are _____ and if the precipitate is hard and adhering on the inner wall, it is called _____ a) Sludges, scale b) Scale, sludges c) Sludges, rodent d) Scale, rodent	a	1
48	1	2	1	The scales decrease the efficiency of boiler and chances of explosions are also there. a) True b) False	a	1
49	1	2	1	The propulsion of water into steam drum by extremely rapid, almost explosive boiling of water at the heating surface is called _____ a) Foaming b) Priming c) Corrosion d) Caustic embrittlement	b	1
50	1	1	1	The phenomenon during which the boiler material becomes brittle due to accumulation of caustic substances is known as _____ a) Foaming b) Priming c) Corrosion d) Caustic embrittlement	d	1
51	1	1	1	Foaming is caused by the formation of _____ a) Acids b) Alcohols c) Oils and alkalis d) Ketones	c	1

52	1	1	1	Foaming can be prevented by a) Acids b) Alcohols c) Oils and alkalis d) Ketones	c	1
53	1	1	1	Carbon dioxide dissolved in water can be removed by adding calculated quantity of_____. a) Liquid ammonia b) Hydrazine c) Sodium sulphide d) Sodium carbonate	a	1
54	1	1	1	Caustic embrittlement can be avoided by adding to boiler feed water_____. a) Lignite b) Castor oil c) Sodium phosphate d) Lignin	b	1
55	1	1	1	Dissolved oxygen can be removed by adding calculated quantity of_____. a) Sodium carbonate b) Sodium bicarbonate c) Sodium sulphate d) Sodium sulphite	d	1
56	1	1	1	Dissolved sodium hydroxide in boiler water leads to _____. a) Priming and foaming b) Caustic embrittlement c) Corrosion d) Scale and sludge formation	b	1
57	1	1	1	Foaming is caused due to_____. a) Surface tension of water is lowered due to presence of clay. b) Presence of Oil or grease in make-up water. c) Violent agitation of boiler feed water. d) All of the above.	d	1
58	1	1	1	Ill effects of scale formation in boilers are_____. a) Wastage of fuel b) Overheating of boilers c) Lowering safety of boilers d) All of the above	d	1
59	1	1	1	Priming is caused due to_____. a) High steam velocities b) Level of water beyond the safe limits.	d	1

				c) Presence of suspended impurities in boiler water. d) All of the above		
60	1	1	1	Which of the following gases is basic _____. a) NH_3 b) SO_2 c) N_2 d) CO_2	a	1
61	1	1	1	Scales are formed in boilers due to _____. a) Decomposition of bicarbonates b) Decrease in solubility of calcium sulphate c) Hydrolysis of magnesium salts d) All of the above	d	1
62	1	1 2	1	The permitted hardness of water for high pressure boilers is a) 40-80 ppm b) 10-40 ppm c) 0-3 ppm d) None of the above	c	1
63	1	1 2	1	The permitted hardness of water for low pressure boilers is_____. a) 40-80 ppm b) 10-40 ppm c) 0-3 ppm d) None of the above	a	1
64	1	1	1	Coagulants help in setting of_____. a) Fine suspended impurities b) Colloidal impurities c) Hardness causing salts d) Both a and b	d	1
65	1	1	1	Scale formation in boilers can be prevented by----------_____ a) Acid- base titration b) Complexometric titration c) EDTA conditioning d) Potentiometric titration	c	1
66	1	1	1	Decomposition of bicarbonates is responsible for a) Sludge formation b) Boiler corrosion c) Priming and foaming d) Scale formation	d	1
67	1	1	1	Boiler corrosion does not occur due to__ a) Dissolved oxygen b) Dissolved CO2 c) Acid from dissolved salts	d	1

				d) hydrazine		
68	1	1	1	Hard adherent deposits are formed due to__ a) Presence of silica b) Presence of nitrogen c) Presence of oxygen d) Presence of carbon	a	1
69	1	1	1	Scales are removed by__ a) Using $NaHCO_3$ b) Using scrapers c) Using hard water d) Using $ZnSO_4$	b	1
70	1	1	1	Sludge formation can be prevented ___ a) By using hard water b) By using saline water c) By blow-down operation d) By using acidic water	c	1
71	1	1	1	Sludges are formed at a) Comparatively colder portion of the boiler b) Hottest portion of the boiler c) Outside the boiler d) In distilled water	a	1
72	1	1	1	Solubility of $CaSO_4$ a) Increases with temperature b) Decreases with temperature c) Remain same with temperature d) None of these	b	1
73	1	1	1	For treatment of water preferred zeolites are _____ a) Primary zeolites b) Synthetic zeolites c) Natural zeolites d) secondary zeolites	B	1
74	1	1	1	when zeolite is completely converted into calcium and magnesium zeolite is a) exhausted b) tired c) expired d) drained	A	1
75	C O1	P O 1	B 1	Structure of zeolite has framework of_____. (a) Tetrahedral SiO2 (b) Tetrahedral Na2O (c) Tetrahedral Al2O3	A	1

				d) Tetragonal SiO2		
76	CO1	PO1	B1	Anion exchange resin is denoted as_____. (a) R(OH)2 (b) RH2 (c) ROOH (d) RCOH	A	1
77	CO1	PO1	B1	Anion exchange resin has functional group_____. (a) -SO3H (b) -NMe3OH (c) -CH4 (d) -SO4	B	1
78	1	1	B1	Cation exchange resin has functional group_____. (a) -SO3H (b) -NMe3OH (c) -CH4 (d) -SO4	A	1
79	1	1	B1	In softening of water by zeolites which of the following statement is most appropriate___. (a) Hardness of water is removed (b) All cations& anions are removed from water (c) All anions are removed from water (d) Soft water is obtained and contains equivalent quantities of sodium salts	D	1
80	1	1	B1	Sodium zeolite is not capable of exchanging _____. (a) Al+3 ions (b) Na+ ions (c) Ca+2 ions (d) Mg+2 ions	B	1
81	1	1	B1	Sodium zeolite or permutit can be represented as_____. (a) Mg2O.Al2O3.xSiO2.yH2O (b) Na2O.Al2O3.xSiO2.yH2O (c) Ca2O.Si2O3.xNa2O.yH2O (d) Si2O.Al2O3.xK2O.yH2O	B	1
82	1	1	B1	The exhausted resins in the ion exchange process are regenerated by_____. (a) Cation exchanger by 10 % NaCl & anion exchanger by dil. NaOH (b) Cation exchanger by dil. HCl & anion exchanger by 10% NaCl (c) Cation exchanger by dil. NaOH & anion exchanger by dil. HCl (d) Cation exchanger by dil. HCl & anion exchanger by dil. NaOH	D	1

82	1	1	B 1	The exhausted zeolite bed is in the form of_____. (a) Na_2Ze (b) K_2Ze (c) CaZe (d) H_2Ze	C	1
83	1	1	B 1	Water percolated over zeolite bed should not contain any_____. (a) Hardness (b) Mineral acids (c) Ca ions (d) Mg ions	B	1
84	1	1	B 1	Zeolite process cannot be used for removal of _____. (a) Ca salts (b) Mg salts (c) Na salts (d) All of the above	C	1
85	1	1	B 1	Zeolite softener gives water with residual hardness_____. (a) Above 50 ppm (b) 0 ppm (c) About 0-5 ppm (d) None of the above	C	1
86	1	1	B 1	Conversion factor for converting mg of NaCl in terms of CaCO is_____. (a) 100/58.5 (b) 58.5/100 (c) 58.5/50 (d) 50/58.5	D	1
87	1	1	B 2	In the softening of water by sodium zeolite, which of the following is most appropriate ? (a) Water of zero hardness obtained (b) All the cations and anions are removed from water (c) Water of zero hardness obtained and all cations are also removed from water (d) Water of zero hardness obtained but treated water contains equivalent quantities of sodium salts.	D	1
88	1	PO 1	B 1	The water entering in anion exchanger resin from cation exchanger resin is_____. (a) Hard (b) Basic (c) Acidic	C	1

				(d) Neutral		
89	1	PO1	B1	The method of water treatment by which distilled water quality output water is obtained is_ (a) Zeolite method (b) Ion Exchange Method (c) Lime-soda method (d) Sodium phosphate method	B	1
90	1	PO2	B3	If 5% NaCl solution is used for regeneration of zeolite, calculate amount of CaCO3 equivalent hardness which can be removed by one liter of NaCl solution_____. (a) 42.735mg (b) 42735 mg (c) 4.2735 gm (d) 42735gm	B	2
91	1	PO2	B3	40 gm of NaCl can be expressed as _____ mg of CaCO3 equivalent (a) 3.41×10^5 (b) 3.41×10^4 (c) 3.41×10^3 (d) 3.41×10^2	B	2
92	1	PO2	B3	5.85 g of NaCl has CaCO3 equivalence as_____. (a) 5×10^1 mg (b) 5×10^2 mg (c) 5×10^3 mg (d) 5×10^4 mg	C	2
93	1	PO2	B3	Amount of NaCl in 100 litres of 12 % brine solution is _____ mg of NaCl. (a) 12×10^5 (b) 1.2×10^5 (c) 120×10^5 (d) 0.12×10^5	C	2
94	1	PO2	B3	If 8% NaCl solution is used for regeneration of zeolite, calculate amount of CaCO3 eq. hardness which can be removed by one litre of NaCl solution_____. (a) 68376.06mg (b) 68.376mg (c) 6.8376 gm (d) 683.76gm	A	2
95	1	PO2	B3	An exhausted zeolite was regenerated by 50 lit. of NaCl solution containing 5gm NaCl per lit. How many liters of hard water having hardness 250ppm CaCO3 equivalent can be softened ? (a) 8547lit	B	2

				(b) 854.7lit (c) 85.47 lit (d) 85470lit		
96	1	PO2	B3	A zeolite get exhausted on softening 2000 lit of hard water. An exhausted zeolite then regenerated by 15 lit of 6% NaCl solution. Calculate hardness of present in water_____. (a) 38.461mg/lit (b) 3846.1mg/lit (c) 3.846mg/lit (d) 384.61mg/lit	D	2
97	1	PO1	B1	The regeneration of zeolite bed involves the reaction_____. (a) CaZ + 2NaCl → Na2Z + CaCl2 (b) Na2Z + MgCl2 → CaZ + 2 NaCl (c) Na2Z + CaCl2 → CaZ + 2 NaCl (d) None of these	A	1
98	1	PO1	B1	For zeolite process which of the following statement is not true_____. 1. Equipment used is compact. 2. Process can be used for highly acidic and alkaline water sample. 3. No impurities are precipitated, so no sludge formation. 4. Process can be use for water containing iron and manganese salts. (a) 1 & 2 (b) 2 & 3 (c) 2 & 4 (d) 1 & 4	C	1
99	1	PO1	B1	During the deionisation process_____. (a) The raw water first should be passed through anion exchanger resin and then cation exchange resin (b) The raw water should be first passed through cation exchanger resin and then through anion exchanger resin. (c) The raw water may be passed through any one resin and then through the another. (d) All the above.	B	1
100	1	PO1	B2	Zeolite treatment involves the following chemical reaction _____ a) CaZ + 2NaCl → Na_2Z + $CaCl_2$ (b) Na_2Z + $MgCl_2$ → CaZ + 2 NaCl (c) Na_2Z + $CaCl_2$ → CaZ + 2 NaCl	C	1

				(d) None of these		
101	1	PO1	B1	In softening of water by sodium zeolite which of the following statement is most appropriate a) water of 0 ppm hardness obtained b) all cations & anions are removed from water c) water of 0-5 ppm hardness is obtained & all cations are also removed from water d) water of hardness 0 -5 ppm is obtained but treated water contains equivalent quantities of sodium salts are obtained	D	1
102	1	PO2	B1	The exhausted zeolites due to softening of hard water, is regenerated by a) NaOH solution b) 10 %NaCl solution c) Na_2CO_3 soln d) HCl soln	B	1
103	1	PO2	B1	Zeolites work on the principle of a) Cation exchange ia)Anion exchange iia)Silicate exchange d)Iron exchange	A	1
104	1	PO2	B1	The cation exchanger resin a) Captures all H+ ions b) Captures all cations c) Captures hard water salts d) Captures HCl	B	1
105	1	PO1	B1	The cation exchanger resins are sulphonated or carboxylated so as to a) Get them in a bead like form b) Have loosely held H+ ions on to them c) Have exchange cations on them d) Both ii & iii	D	1
106	1	PO1	B2	Regeneration of cation exchanger resin reaction is a) $H_2R + 2Na^+ \rightarrow Na_2R + 2H^+$ b) $RCl_2 + 2\ NaOH \rightarrow R(OH)_2 + 2\ NaCl$ c) $RCa + 2\ HCl \rightarrow R\ H_2 + CaCl_2$ d) $H_2R + 2Ca \rightarrow CaR + 2H+$	C	1
107	1	PO1	B1	Water is passed through a cation exchange resin first because a) It is easier to use b) It is cost effective	D	1

				c) It produces acidic water d) Water from here does not spoil anion exchange beads		
108	1	PO1	B1	A method of water softening that removes hardness ions and replaces them with sodium ions is a) Washing soda addition b) Calgon conditioning c) Zeolite method d) All of the above	C	1
109	1	PO1	B1	For the softening of hard water by zeolite a) quantity of hardness causing salts in water should be accurately known b) quantity of hardness causing salts in water need not be known c) total dissolved solids in water should be known d) hard water should be sterilized before treatment	a	1
110	1	PO2	B3	How many litres of NaCl will be required to regenerate a zeolite bed which has capacity of softening 2500L of water of 400 mg CaCO3 equivalent hardness per liter. Conc. of NaCl = 50000 ppm of CaCO3 equivalent_____. a)2 L b) 200 L c) 20 L d) 0.2 L	c	1
111	1	PO2	B3	A zeolite bed gets exhausted on softening 2000L of water sample and requires 10 L of 10 % NaCl for regeneration. Find the hardness of water sample. a) 473.25 ppm b) 472.35 ppm c) 427.35 ppm d) 450.23 ppm	C	2
112	1	PO2	B3	A zeolite bed gets exausted on softening 2500 L of waater sample whichj requires 10 L of 5 % Nacl for regeneration. F ind the hardness of water sample. a) 177 ppm b) 711 ppm c) 117 ppm	d	2

				d) 171 ppm		
113	1	PO2	B3	How many litres of NaCl will be required to regenerate a zeolite bed which has capacity of softening 1000L of water of 250 mg $CaCO_3$ equivalent of hardness per litre . Conc of NaCl = 25000 ppm $CaCO_3$ equivalent ____ a) 0.1 L b) 1 L c) 10 L d) 100 L	C	2
114	1	PO2	B3	Zeolite softener was completely exhausted and was regenerated by passing 60 L of NaCl solution containing 1170 mg/L NaCl. How many liters of sample water of hardness 200 ppm can be softened by this softener ? a) 60 L b) 66 L c) 300 L d) 660 L	C	2
115	1	PO1	B1	Natural zeolites are _____ a) porous, gel structure, less durable b) non porous, gel structure, more durable c) non porous, green sand, more durable d) porous, green sand, more durable	A	1
116	1	PO1	B1	synthetic zeolites are_____ a) non - porous, green sand b) non porous, gel structure c) porous, green sand, d) porous, gel structure	A	1
117	1	PO1	B1	Reverse osmosis carried out with semipermeable membrane having limited ions permeability gives a.drinking water b. water for industrial use c. . distilled quality water d. salty taste water	A	1
118	1	PO1	B1	Which of the following methods use ion-selective membranes, a. reverse osmosis b. electrodialysis c. ultrafiltration d. ion-exchange	B	1
119	1	PO1	B2	Reverse osmosis process involves a. solvent moves from solution of higher concentration to lower, through semi permeable membrane	A	1