Program: FE (All branches)

Curriculum Scheme: Revised 2019

Examination: First Year Semester I

Course Code: FEC203 **Course Name: Engineering Chemistry**
Time: 1 hour **Max. Marks: 50**

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Which of the following ion get released from the cation exchange column?
Option A:	**H^+**
Option B:	Na^+
Option C:	K^+
Option D:	Ca^{+2}
Q2.	The process of removal of hardness of water, irrespective of whether it is temporary or permanent is termed as _____
Option A:	Cleansing action of water
Option B:	Hardness of water
Option C:	**Softening of water**
Option D:	Purity of water
Q3.	Potable water treatment does not involve _____
Option A:	Disinfection
Option B:	**Demineralization**
Option C:	Coagulation
Option D:	Sedimentation
Q4.	What is total hardness of sample of water which has the following impurities in mg/l – $Ca(HCO3)_2$ = 162, $CaCl_2$ = 22.2, $MgCl_2$ =95, KCl = 20
Option A:	**220ppm**
Option B:	222ppm
Option C:	212ppm
Option D:	221ppm
Q5.	Calculate the COD of an effluent sample if 25 c.c. of the effluent sample required 8.3c.c. of 0.001M K_2Cr_2O7 for oxidation.
Option A:	**2.656ppm**
Option B:	2.565ppm
Option C:	2.665ppm
Option D:	2.556ppm
Q6.	Reverse osmosis is flow of_____
Option A:	**Solvent from high to low concentration**

<table>
<tr><td>Option B:</td><td>Solvent from low to high concentration</td></tr>
<tr><td>Option C:</td><td>Solute from high to low concentration</td></tr>
<tr><td>Option D:</td><td>Solute from low to high concentration</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Q7.</td><td>Multiplication factor of HCO_3^-</td></tr>
<tr><td>Option A:</td><td>100/61</td></tr>
<tr><td>Option B:</td><td>100/61*2</td></tr>
<tr><td>Option C:</td><td>100/62</td></tr>
<tr><td>Option D:</td><td>100/62*2</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Q8.</td><td>Calculate the number average molecular weight of the polymer

<table><tr><td>Number of polymers, N1</td><td>Molecular weight of each polymer, M1</td></tr><tr><td>1</td><td>100</td></tr><tr><td>2</td><td>200</td></tr><tr><td>3</td><td>400</td></tr><tr><td>2</td><td>500</td></tr><tr><td>1</td><td>600</td></tr></table></td></tr>
<tr><td>Option A:</td><td>366.67</td></tr>
<tr><td>Option B:</td><td>36.67</td></tr>
<tr><td>Option C:</td><td>3.667</td></tr>
<tr><td>Option D:</td><td>0.3666</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Q9.</td><td>The temperature at which the polymer experiences the transition from rubbery to rigid state is known as _____</td></tr>
<tr><td>Option A:</td><td>Glass transition temperature</td></tr>
<tr><td>Option B:</td><td>Melting temperature</td></tr>
<tr><td>Option C:</td><td>Boiling temperature</td></tr>
<tr><td>Option D:</td><td>Freezing temperature</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Q10.</td><td>The neighboring polymeric chains in thermosets are held together _____</td></tr>
<tr><td>Option A:</td><td>Vander Waal’s force</td></tr>
<tr><td>Option B:</td><td>Hydrogen bond</td></tr>
<tr><td>Option C:</td><td>Covalent bond</td></tr>
<tr><td>Option D:</td><td>Electrovalent bond</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Q11.</td><td>Which ingredient is used as a function of plastic to reduce the flexibility?</td></tr>
<tr><td>Option A:</td><td>Extenders</td></tr>
<tr><td>Option B:</td><td>Resins</td></tr>
<tr><td>Option C:</td><td>Plasticizer</td></tr>
<tr><td>Option D:</td><td>Lubricant</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Q12.</td><td>_____is used as a cloud and pour point depressant additives in lubricants.</td></tr>
<tr><td>Option A:</td><td>PMMA</td></tr>
<tr><td>Option B:</td><td>Kevlar</td></tr>
</table>

Option C:	PF
Option D:	UF
Q13.	Reactant for Kevlar synthesis_____
Option A:	**Dichloroterepthalate & 1, 4-diaminobenzene**
Option B:	Trichloroterepthalate & 1, 2-diaminobenzene
Option C:	Dichloroterepthalate & aniline
Option D:	Dichloro acid & 1, 4-diaminobenzene
Q14.	Calculate the number of phases at the sublimation curve.
Option A:	2
Option B:	3
Option C:	**4**
Option D:	0
Q15.	Calculate the degree of freedom for the following reaction. $CH4 \longrightarrow CO2\ (gas) + 2H20$
Option A:	**2**
Option B:	3
Option C:	4
Option D:	6
Q16.	Calculate the degree of freedom for decomposition of potassium permanganate.
Option A:	3
Option B:	**2**
Option C:	1
Option D:	0
Q17.	From the following options, choose the heteronuclear diatomic molecules which are paramagnetic in nature?
Option A:	HF and NO
Option B:	HF and O_2
Option C:	NO and O_2
Option D:	**Only NO**
Q18.	Bond order of NO^+ molecule is _____
Option A:	2
Option B:	**3**
Option C:	2.5
Option D:	4
Q19.	Which of the following molecules have bond order equal to 1?
Option A:	NO, HF, HCl, Li_2, CO
Option B:	**H_2, Li_2, B_2, HF, HCl**
Option C:	Li_2, B_2, CO, NO,He_2^+
Option D:	B_2, CO, He_2^+, NO, HF

Q20.	In Cyclopentadiene _____∏ electrons which is not a Huckel number hence its _____ while Cyclopentadienyl anion _____∏ electrons which is not a Huckel number hence its _____
Option A:	**4, anti-aromatic ,6, aromatic**
Option B:	4, aromatic ,6, anti-aromatic
Option C:	6, anti-aromatic ,4, aromatic
Option D:	6, aromatic ,4, anti-aromatic
Q21.	What is Bond angle, Bond length C-C, Bond length C=C and Bond length C-H of molecular orbital structure of benzene
Option A:	**120°, 1.39A°, 1.34A°, 1.09A°**
Option B:	100°, 2.39A°, 1.34A°, 1.09A°
Option C:	120°, 1.39A°, 0.34A°, 1.09A°
Option D:	120°, 1.39A°, 1.34A°, 1.22A°
Q22.	In structure of pyrrole five parallel _____ containing _____ to form a delocalized ∏ MO.
Option A:	**P orbitals , six electrons**
Option B:	P orbitals , four electrons
Option C:	P orbitals , five electrons
Option D:	s orbitals , six electrons
Q23.	Which one of the following molecules would be most polar?
Option A:	**HF**
Option B:	HCl
Option C:	HBr
Option D:	HI
Q24.	The boiling point of CH_4 is much lower than that of HF. This is because:
Option A:	**of hydrogen bonding in HF**
Option B:	of ion-dipole interactions in CH_4
Option C:	CH_4 is polar
Option D:	of dipole-dipole interactions in CH_4
Q25.	At room temperature, F_2 and Cl_2 are gases, Br_2 is a liquid, and I_2 is a solid. This is because:
Option A:	**dispersion interactions increase with molecular size.**
Option B:	dipole-induced dipole interactions increase with molecular size.
Option C:	dipole-dipole interactions increase with molecular size.
Option D:	polarity increases with molecular size.