

University of Mumbai
Examination 2020

Program: FE (REV. -2016) (Choice Based)Engineering

Curriculum Scheme: Rev2016

Examination: First Year Semester I

Course Code: FEC104 and Course Name: EC-I/AC-I

Time: 1 hour

Max. Marks: 50

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

Q1.	Molecules are held together in a crystal by
Option A:	hydrogen bond
Option B:	electrostatic attraction
Option C:	Van der Waal's attraction
Option D:	dipole-dipole attraction
Q2.	The breaking of a covalent bond in such a way that each atom separates with one electron of the shared pair is called
Option A:	Homolytic fission
Option B:	Heterolytic fission
Option C:	Monolytic fission
Option D:	Morpholytic fission
Q3.	Carbonium ions are the intermediates in which the positive charge is carried by the carbon atom with _____ electrons in the valence shell.
Option A:	3
Option B:	5
Option C:	4
Option D:	6
Q4.	Which of the following is an incorrect statement?
Option A:	First step in photochemistry is excited state (photoexcitation)
Option B:	Photochemical reactions are caused by absorption of ultraviolet only
Option C:	When a molecule or atom in the ground state (S ₀) absorbs light, one electron is excited to a higher orbital level
Option D:	It is possible for the excited state S ₁ to undergo spin inversion
Q5.	The molar extinction coefficient of B (MW = 180) is $4 \times 10^3 \text{ L mol}^{-1} \text{ cm}^{-1}$. One-liter solution of C which contains 0.1358 g pharmaceutical preparation of B, shows an absorbance of 0.411 in a 1 cm quartz cell. What is the percentage (w/w) of B in the pharmaceutical preparation?
Option A:	10.20
Option B:	13.60
Option C:	20.40
Option D:	29.12
Q6.	A 0.1 M solution of compound A shows 50% transmittance when a cell of 1 cm width is used at $\lambda_1 \text{ nm}$. Another 0.1 M solution of compound B gives the optical density value of 0.1761 using 1cm cell at $\lambda_1 \text{ nm}$. What will be the transmittance of a solution that is simultaneously 0.1 M in A and 0.1 M in B

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	using the same cell and at the same wave length? [$\log 1.301$; $\log 1.4771$; $\log 50 = 1.699$].
Option A:	33.3%
Option B:	50%
Option C:	66.7%
Option D:	70%
Q7.	Which of the following is the incorrect statement about Zeise's salt?
Option A:	Zeise's salt is diamagnetic
Option B:	Oxidation state of Pt in Zeis's salt is +2
Option C:	All the Pt-Cl bond length in Zeise's salt are equal
Option D:	C-C bond length of ethylene moiety in Zeise's salt longer than that of free ethylene molecule
Q8.	Which of the following statements regarding nucleophilicity is wrong?
Option A:	Ethoxide ion is more nucleophilic than t-butoxide in spite of its lower basicity.
Option B:	Ethoxide ion is more nucleophilic than t-butoxide due to the lower steric hindrance.
Option C:	Chloride ion is more nucleophilic than iodide ion because of its higher basicity.
Option D:	Bromide ion is more nucleophilic than fluoride in spite of its lower basicity.
Q9.	What is oxidation number of Fe in Rubredoxin, Fe-S protein ?
Option A:	+2
Option B:	+3
Option C:	+6
Option D:	+2 & +3
Q10.	When 0.1 mol $\text{CoCl}_3(\text{NH}_3)_5$ is combined with excess AgNO_3 , then 0.2 mol AgCl is obtained. The conductivity of the solution suits the
Option A:	1:3 electrolyte
Option B:	1:1 electrolyte
Option C:	3:1 electrolyte
Option D:	1:2 electrolyte
Q11.	Some salts containing two different metallic elements give test for only one of them in solution, such salts are
Option A:	double salts
Option B:	normal salts
Option C:	complex salts
Option D:	None of these
Q12.	In allene (C_3H_4), the type(s) of hybridisation of the carbon atoms is
Option A:	sp and sp^3
Option B:	sp and sp^2
Option C:	Only sp^2
Option D:	sp^2 and sp^3

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Q13.	MX ₆ is a molecule with octahedral geometry. How many X – M – X bonds are at 180°?
Option A:	four
Option B:	two
Option C:	three
Option D:	six
Q14.	Which regions of the light radiations of the visible ultraviolet lying between – wavelength are chiefly concerned in bringing about photochemical reactions?
Option A:	1000 Å and 2000 Å
Option B:	1500 Å and 1000 Å
Option C:	8000 Å and 2000 Å
Option D:	19000 Å and 12,000 Å
Q15.	Which of the following will result in deviation from Beer's law? (A) Change in a refractive index of medium (B) Dissociation of analyte on dilution (C) Polychromatic light (D) Path length of cuvette
Option A:	A, B and C
Option B:	B, C and D
Option C:	A, C and D
Option D:	A, B and D
Q16.	A substance absorbs 2.0×10^{16} quanta or radiations per second and 0.002 mole of it reacts in 1200 seconds. What is the quantum yield or the reaction ($N = 6.02 \times 10^{23}$)?
Option A:	50
Option B:	40
Option C:	80
Option D:	100
Q17.	Calculate the degrees of unsaturation for a molecule with the molecular formula C ₉ H ₁₀ FNO ₃
Option A:	0
Option B:	3
Option C:	4
Option D:	5
Q18.	Which of the following reagents must be used with HBr to convert 1-hexene to 1-bromohexane?
Option A:	HSO ₃
Option B:	NaBH ₄
Option C:	ROOR
Option D:	Pd/C
Q19.	Valence Bond Theory was developed in the year?
Option A:	1916

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Option B:	1927
Option C:	1930
Option D:	1932
Q20.	The shape of carbocation is
Option A:	Pyramidal
Option B:	Bent
Option C:	Linear
Option D:	Trigonal planar
Q21.	The hybridization of carbanion is
Option A:	Sp
Option B:	Sp ²
Option C:	Sp ³
Option D:	Sp ³ d
Q22.	The formal charge at the carbanion is
Option A:	+1
Option B:	-1
Option C:	0
Option D:	+2
Q23.	The reaction rate constant may be defined as the rate of the reaction when the concentration of each reactants is
Option A:	Zero
Option B:	Unity
Option C:	Doubled the initial concentration
Option D:	Infinite
Q24.	Which of the following is the necessary condition for desulphonation?
Option A:	Remove volatile hydrocarbon by steam distillation
Option B:	Low concentration of water
Option C:	High concentration of sulphonating agent
Option D:	A large excess of fuming sulphuric acid
Q25.	The compound that can be most readily sulphonated is _____
Option A:	Benzene
Option B:	Nitrobenzene
Option C:	Toluene
Option D:	Chlorobenzene