B.Tech (1st Sem) Mid-Term Examination; Subject: Chemistry; Code:CYC01

Full Marks: 25; Time: 50 minutes (10-10.50 AM); Date: 17.02.2022

Enable Immersive Reader

Points: 25/25

1

Name of the Student
*

Prince Maurya

2

Roll number (Please write complete roll no. e.g. 21A80001)
*

21D80005

3

Section (A/B/C/D/E)
*

D

4

Among the following ions which one has the highest paramagnetism?
(1/1 Point)

- [Zn(H2O)6]+2
- [Cu(H2O)6]+2
- [Fe(H2O)6]+2 ✓
- [Cr(H2O)6]+3

5

The number of unpaired electrons in [Ni(CO)4] is
(1/1 Point)

- 0 ✓
- 2
- 3
- 1

6

The CFSE value for a high spin octahedral complex having d^5 configuration is
(1/1 Point)

- 0 ✓
- 2 Dq
- 1.2 Dq
- -0.6 Dq

7

In [NiF6]^-4, [FeF6]^-3, [TiF6]^-2 and CrF2
(1/1 Point)

- all show Jahn-Teller distortion
- [NiF6]^-4 and [TiF6]^-2 show Jahn-Teller distortion
- only CrF2 shows Jahn-Teller distortion ✓
- none of the above

8

The lowest energy d-d transitions in Cr+3 complexes varies in the order
(1/1 Point)

- [CrCl6]^-3 < [Cr(H2O)6]^+3 < [Cr(en)3]^+3<[Cr(CN)6]^-3
- [CrCl6]^-3 < [Cr(en)3]^+3 < [Cr(H2O)6]^+3 < [Cr(CN)6]^-3
- [Cr(CN)6]^-3 < [CrCl6]^-3 < [Cr(H2O)6]^+3< [Cr(en)3]^+3 ✓
- [Cr(H2O)6]^+3 < [CrCl6]^-3< [Cr(en)3]^+3 < [Cr(CN)6]^-3

9

The existence of two different coloured complexes of [Co(NH3)4Cl2] is due to
(1/1 Point)

- optical isomerism
- linkage isomerism
- geometrical isomerism ✓
- coordination isomerism

10

CrO3 is bright orange in colour due to
(1/1 Point)

- d-d transition
- Charge transfer transition ✓
- both transitions
- none of the above

11

d orbital splitting in tetrahedral ligand field is
(1/1 Point)

- same as octahedral ligand field
- same as square planar ligand field
- opposite of octahedral ligand field ✓
- opposite of square planar ligand field

12

Number of vibrational degrees of freedom for benzene will be
(1/1 Point)

- 12
- 13
- 30 ✓
- 31

13

For which molecule ν(OH) will not decrease on dilution?
(1/1 Point)

- Acetic acid
- p- hydroxy benzoic acid
- m-nitro phenol
- o- hydroxy benzaldehyde ✓

14

Change in ε towards higher value is known as
(1/1 Point)

- Hypsochromic shift
- Hyperchromic shift ✓
- Hypochromic shift
- Bathochromic shift

15

Which statement is true for Robinson's annulation reaction?
(1/1 Point)

- Addition of a hard nucleophile to α,β-unsaturated carbonyl compound in one of the step
- Addition of a soft nucleophile to α,β-unsaturated carbonyl compound in one of the ste ✓
- Addition of hard nucleophile to carbonyl carbon in Michael addition reaction
- Addition of a soft nucleophile to carbonyl carbon in Michael addition reaction

16

The driving force for Wittig reaction is
(1/1 Point)

- bond energy of C=C bond
- betaine formation
- nucleophilicity of ylide
- Phosphorus oxygen bond formation ✓

17

Hydroboration-oxidation reactions is
(1/1 Point)

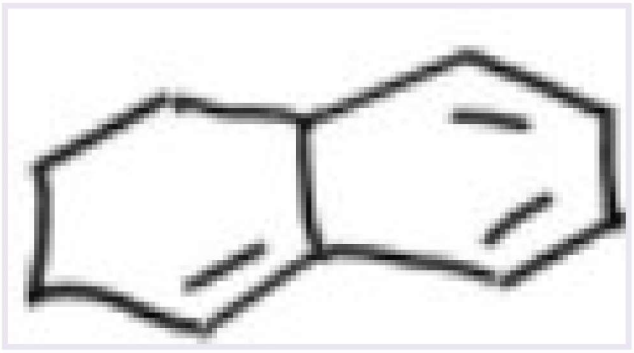
- Stereoselective but nor regioselective
- Regioselective but not stereoselective
- Regioselective as well as stereoselective ✓
- stepwise addition of hydrogen and boron atom to carbon-carbon double bond

18

Which of the following statement is correct?
(1/1 Point)

- (●) Grignard reagent is more reactive than Gilman reagent ✓
- ( ) Grignard reagent is more specific than Gilman reagent
- ( ) Grignard reagent and Gilman reagent have equal reactivity
- ( ) Grignard reagent and Gilman reagent have equal specificity

19



The **λ**(max) for the following molecule should be

(1/1 Point)

- (●) 308 nm ✓
- ( ) 298 nm
- ( ) 269 nm
- ( ) 259 nm

20

The temperature of a system decreases in an
(1/1 Point)

- (●) Adiabatic expansion ✓
- ( ) isothermal expansion
- ( ) isothermal compression
- ( ) adiabatic compression

21

An ideal gas thermodynamical engine operates between 227 °C and 127 °C. It absorbs 6x10^4 J energy. The amount of heat converted into work is
(1/1 Point)

- ( ) 4.8x10^4 J
- ( ) 3.5x10^4 J
- ( ) 1.6x10^4 J
- (●) 1.2x10^4 J ✓

22

The heat supplied to a system containing an ideal gas in isothermal condition is used to
(1/1 Point)

- ( ) Increase temperature
- ( ) increase internal energy
- ( ) increase and doing external work
- (●) do external work ✓

23

Thermodynamics is not concerned about_____.
(1/1 Point)

- energy changes involved in a chemical reaction.
- the extent to which a chemical reaction proceeds.
- the rate at which a reaction proceeds. ✓
- the feasibility of a chemical reaction.

24

Which thermodynamic function accounts automatically for enthalpy and entropy both?
(1/1 Point)

- Helmoltz free energy
- Work function
- internal energy
- Gibb's free energy ✓

25

When water freezes in a glass beaker, choose the correct statement amongst the following for the change of entropy
(1/1 Point)

- ΔS (system) decreases but ΔS (surroundings) remains the same
- ΔS (system) increases but ΔS (surroundings) decreases.
- ΔS (system) decreases but ΔS (surroundings) increases. ✓
- ΔS (system) decreases and ΔS (surroundings) also decreases.

26

Joule-Thomson expansion is an example of
(1/1 Point)

- Isothermal process
- isochoric process
- iso-enthalpic process ✓
- iso-entropic process

27

In which of the following process, a maximum increase in entropy is observed?
(1/1 Point)

- Dissolution of NaCl in Water
- Sublimation of Naphthalene ✓
- Condensation of Water
- Melting of Ice

28

Which of the following is not correct?
(1/1 Point)

- ΔG is positive for a spontaneous reaction ✓
- ΔG is zero for a reversible reaction
- ΔG is negative for a spontaneous reaction
- ΔG is positive for a non-spontaneous reaction

Go back to thank you page

out your password.