

Subject Code **2034**

CHEMISTRY(Core-14)

Question Booklet No.

Signature of Invigilator	To be filled in by candidate by ball-point pen only	OMR Sl. No. _____
	Roll No. _____	_____
Time of Examination	Declaration : I have read and understood the instructions given below.	
Date of Examination	Full Signature of Candidate	Full Marks : 80/50 Time : 1 hour
	Name of Candidate	

Number of Questions in the Booklet } **50/40**



UU 6th Semester Examination, 2020

INSTRUCTIONS TO CANDIDATES

- Immediately after getting the booklet read instructions carefully mentioned on the front and back page of the Question Booklet. Do not open the seals unless asked by the Invigilator.
- Write your Roll No., OMR Response Sheet No., in the specified places given above and put your signature.
- Write the subject code of the booklet in your OMR Sheet.
- Make all entries in the OMR Response Sheet as per the given instructions; otherwise OMR Response Sheet will not be evaluated.
- After opening the seals, ensure that the Question Booklet contains total no. of pages as mentioned above and printing of all the **50 / 40** questions are proper. If any discrepancy is found, inform the invigilator within **15** minutes and get the correct Question Booklet.
- For each question in the Question Booklet choose the correct option from the given four alternatives and darken the same circle in the OMR Response Sheet with Black or Blue ball-point pen.
- Darken the circle of correct answer properly; otherwise answers will not be evaluated. The candidate will be fully responsible for it.
- If more than one option is darkened for a particular question, then it will be treated as wrong answer.
- After completion of the examination, only OMR Response Sheet is to be handed over to the invigilator.

THERE IS NO NEGATIVE MARKING FOR WRONG ANSWER

Rough Work

CHEMISTRY (CORE -14)

(Answer any 25 questions)

- 1 UV spectroscopy is also known as ___spectroscopy.
- (A) Electronic spectroscopy
(B) Vibrational spectroscopy
(C) Mass spectroscopy
(D) Rotational spectroscopy
- 2 The order of different electronic transitions in UV spectroscopy is
- (A) $\sigma \rightarrow \sigma^* > n \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$
(B) $\sigma \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \sigma^* > n \rightarrow \pi^*$
(C) $\sigma \rightarrow \sigma^* > n \rightarrow \sigma^* > n \rightarrow \pi^* > \pi \rightarrow \pi^*$
(D) $\sigma \rightarrow \sigma^* > n \rightarrow \pi^* > n \rightarrow \sigma^* > \pi \rightarrow \pi^*$
- 3 Shifting of absorption maxima towards longer wave length is called
- (A) Hypsochromic shift
(B) Bathochromic shift
(C) Hyperchromic shift
(D) Hypochromic shift
- 4 In calculating λ_{\max} for a diene or polyene the increment added for one exocyclic double bond is
- (A) 15 nm
(B) 10 nm
(C) 5 nm
(D) 8 nm
- 5 By increasing the polarity of the solvent the shift in $n \rightarrow \pi^*$ is towards ----- wavelength.
- (A) shorter wavelength
(B) longer wavelength
(C) remains unchanged
(D) none of these
- 6 Which molecule shows highest λ_{\max} for $n \rightarrow \sigma^*$ transition?
- (A) $\text{CH}_3\text{-F}$
(B) $\text{CH}_3\text{-Cl}$
(C) $\text{CH}_3\text{-Br}$
(D) $\text{CH}_3\text{-I}$
- 7 When an auxochrome joined to a chromophore it shows
- (A) blue shift
(B) red shift
(C) both (a) & (b)
(D) hypsochromic shift
- 8 For a non-linear molecule having 'n' number of atoms the total number of vibrational degrees of freedom is
- (A) $3n-5$
(B) $3n-6$
(C) $3n+5$
(D) none of these
- 9 The vibrational frequency (for stretching vibration) of a diatomic molecule can be obtained by which law.
- (A) Hooke's law
(B) Newton's law
(C) Dalton's law
(D) none of these

- 10 Calculate the wave number for the stretching vibration of C=C. ($K=10 \times 10^5$ dynes/cm)
- (A) 1670 cm^{-1}
 (B) 1680 cm^{-1}
 (C) 1580 cm^{-1}
 (D) 2000 cm^{-1}
- 11 The number of fundamental degrees of freedom in H_2O is
- (A) 3
 (B) 4
 (C) 2
 (D) 5
- 12 The transitions between $V_0 \rightarrow V_2$ and $V_0 \rightarrow V_3$ give rise to
- (A) overtones
 (B) fundamental vibrations
 (C) red shift
 (D) blue shift
- 13 Formaldehyde absorbs at 1750 cm^{-1} but acetaldehyde absorbs at 1745 cm^{-1} for C=O group in the IR region. This decrease in frequency is due to
- (A) molecular mass
 (B) +I effect of methyl group
 (C) change in hybridisation
 (D) resonance
- 14 Among the following molecules which one shows lowest C=O stretching frequency in I.R spectroscopy.
- (A) cyclohexanone
 (B) cyclopentanone
 (C) cyclobutanone
 (D) can't be determined
- 15 Which of the following molecules doesn't absorb in I.R. region?
- (A) HCl
 (B) CO_2
 (C) H_2O
 (D) CH_3CHO
- 16 How many H^1 NMR signals are obtained for cyclohexane at room temperature?
- (A) 1
 (B) 2
 (C) 3
 (D) 0
- 17 How many spin-spin coupling occurs for C_1 and C_3 protons in the compound $\text{CH}_3\text{-CCl}_2\text{-CH}_3$?
- (A) 0
 (B) 1
 (C) 2
 (D) 3
- 18 In NMR study which compound is used as the reference?
- (A) H_2O
 (B) $\text{Si}(\text{CH}_3)_4$
 (C) H_2
 (D) $\text{Si}(\text{CH}_4)_3$
- 19 A compound having molecular formula $\text{C}_2\text{H}_6\text{O}$ shows one H^1 NMR signal. The structure of the compound will be
- (A) $\text{CH}_3\text{-O-CH}_3$
 (B) $\text{CH}_3\text{-CH}_2\text{-OH}$
 (C) both (a) & (b)
 (D) none of these

- 20 The spacing of the adjacent lines in the multiplets of the spin-spin coupling of the proton is called
- spin-spin coupling constant
 - multiplets
 - gyromagnetic ratio
 - shielding
- 21 The most intense (100%) peak in the mass spectrum is called
- main peak
 - base peak
 - major peak
 - zero peak
- 22 The mass spectrum of a compound is obtained by plotting relative abundance of the ion verses
- Atomic number of carbon
 - Atomic mass of carbon
 - m/e ratio
 - m/p ratio
- 23 Butanaldehyde gives base peak by the loss of
- CHO group
 - CH₂=CH₂
 - CH₃-CH₂-CH₂⁺
 - CH₃-CH₂⁺
- 24 In the mass spectra of a compound the metastable ions recorded as a
- weak peak
 - strong peak
 - moderate peak
 - none of these
- 25 Starch is an example of
- Monosaccharide
 - Disaccharide
 - Polysaccharide
 - Glucose
- 26 D-glucose and D-mannose are
- isomers
 - epimers
 - anomers
 - tautomers
- 27 Specific rotation of Glucose at equilibrium mixture is equal to
- +19°
 - +113°
 - +53°
 - +35°
- 28 The reducing sugars can reduce
- Tollen's reagent
 - Fehling's solution
 - Both (a) and (b)
 - none
- 29 Saturated hydrocarbons show ____ transitions
- $\sigma \rightarrow \sigma^*$
 - $n \rightarrow \sigma^*$
 - $\pi \rightarrow \pi^*$
 - $n \rightarrow \pi^*$
- 30 Picric acid is an example of ____ dye.
- basic dye
 - acid dye
 - moderate dye
 - developed dye

- 31 Which of the following is a basic dye?
(A) naphthol yellow
(B) congo red
(C) malachite green
(D) orange-I
- 32 The coloured substance which is insoluble in water or other substance is called a
(A) dye
(B) pigment
(C) mordant
(D) tartrazine
- 33 Phenolphthalein is
(A) colourless dye
(B) coloured substance in alkali
(C) triphenyl methane dye
(D) both (a) and (b)
- 34 Methyl orange is a
(A) nitro dye
(B) azo dye
(C) nitroso dye
(D) phthalein dye
- 35 Phenol-formaldehyde resin is a _____ polymer.
(A) cross link polymer
(B) linear polymer
(C) branched chain polymer
(D) none of these
- 36 Cellulose is a
(A) natural polymer
(B) synthetic polymer
(C) semi-synthetic polymer
(D) non-biodegradable polymer
- 36 Cellulose is a
(A) natural polymer
(B) synthetic polymer
(C) semi-synthetic polymer
(D) non-biodegradable polymer
- 37 Which is an example of thermoplastic polymer?
(A) Buna-S
(B) PVC
(C) Neoprene
(D) Isoprene
- 38 The % of S in tyre rubber is
(A) 20-25%
(B) 5%
(C) 30%
(D) 10-15%
- 39 What is the composition of natural rubber?
(A) $(C_8H_5)_n$
(B) $(C_6H_6)_n$
(C) $(C_5H_8)_n$
(D) $(C_5H_5)_n$
- 40 Heating of natural rubber with sulphur or sulphur containing compounds at 150°C is known as
(A) vulcanisation
(B) polymerisation
(C) isomerisation
(D) condensation

Rough Work

