



Name: ..... Roll No.: .....

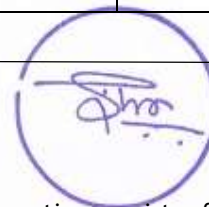
Branch: ..... Signature of Invigilator: .....

Semester: VIth Date: 26/04/2022 (MORNING)

Subject with Code: CH314 ORGANIC CHEMISTRY-V, SPECTROSCOPY

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE



1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. Candidates should write their roll no. in each page of the booklet.
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to submit the question paper cum answer sheets before leaving the examination hall.

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: IMSC  
BRANCH: Chemistry

SEMESTER : VI  
SESSION : SP/22

SUBJECT: CH314 ORGANIC CHEMISTRY V

TIME: 2 Hours

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 30 MCQ each of 1 mark and short answer type questions of 20 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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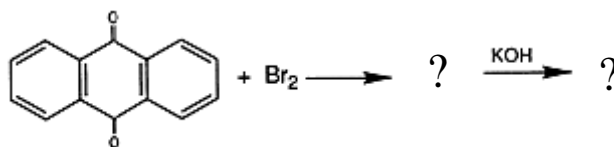
**PART A (30 Multiple Choice Type Questions each of 1 mark)**

- Q.1 An azo dye is fixed on fabrics by the process applicable in  
(a) Vat dyes; (b) Mordant dyes; (c) Developed dyes; (d) Substantive dyes
- Q.2 An azo dye is formed by interaction of an aromatic diazonium chloride with  
(a) A phenol; (b) An aliphatic primary amine; (c) Benzene; (d) Nitrous acid
- Q.3 Which of the following is an example of basic dye  
(a) Alizarin; (b) Indigo; (c) Malachite green; (d) None of the above
- Q.4 Malachite green is prepared by condensing  
(a) Benzaldehyde and dimethyl aniline; (b) Carbonyl chloride and dimethyl aniline;  
(c) Benzene diazonium chloride with dimethyl aniline; (d) None of the above
- Q.5 Which is the stable isomer of Indigo?  
(a) Cis; (b) Trans; (c) Either cis or trans; (d) Both Cis and Trans
- Q.6 Methyl orange is an indicator in acid-alkali titration. It gives  
(a) Yellow colour in alkaline medium; (b) Red colour in acid medium; (c) Yellow colour in acid medium;  
(d) Yellow colour in alkaline medium and red colour in acid medium
- Q.7 Cis-trans isomerisation is possible in  
(a) Polystyrene; (b) Polypropylene; (c) Polyisoprene; (d) Polymethyl acrylate
- Q.8 Amphiphilic polymers are macromolecules that contain  
(a) Both hydrophobic and hydrophilic components; (b) Either hydrophobic or hydrophilic components  
(c) Only hydrophobic component; (d) Only hydrophilic component
- Q.9 In case of synthesized polymer PDI is always  
(a) Greater than 0; (b) Greater than 1; (c) Equal to 1; (c) Less than 1
- Q.10 The reactive species obtain from thermal decomposition of 2,2'-Azobisisobutyronitrile  
(a) Isopropyl radical; (b) Propyl radical; (c) Isobutyl radical (d) Tertiary butyl radical
- Q.11 Spontaneous termination involves in cationic addition polymerization  
(a) Chain transfer to polymer; (b) beta-proton transfer; (c) beta-proton transfer to the counter ion;  
(d) Proton transfer to the solvent or external reagent
- Q.12 LLDPE is a type of  
(a) Co-polymer; (b) Homopolymer; (c) Cross-linked polymer; (d) Linear polymer

- Q.13 Nylon threads are made of  
(a) Polyester polymer; (b) Polyamide polymer; (c) Polyethylene polymer; (d) Polyvinyl polymer
- Q.14 Which of the following is not a natural polymer?  
(a) Rayon; (b) Starch; (c) Cellulose; (d) RNA
- Q.15 Which functional group is present in polyester?  
(a)  $-\text{COO}-$ ; (b)  $-\text{CH}_2-\text{CH}_2-$ ; (c)  $-\text{CONH}-$ ; (d)  $-\text{CH}_2-\text{CN}$
- Q.16 Which of the following substances is an elastomer?  
(a) Nylon 6; (b) Nylon 6,6; (c) Vulcanised rubber; (d) Melamine
- Q.17 The inter-particle forces between linear chains in Nylon-66 are  
(a) H-bonds; (b) Covalent bonds; (c) Ionic bonds; (d) Unpredictable
- Q.18 Which of the following types of polymers has the strongest inter particle forces?  
(a) Elastomers; (b) Thermoplastics; (c) Fibres; (d) Thermosetting polymers
- Q.19 Which of the following compound will show more bathochromic shift in UV-VIS spectra  
(a) Phenoxide; (b) Phenol; (c) Aniline; (d) Anilinium Ion
- Q.20 On increasing conjugation,  $\lambda_{\text{max}}$  of the alkene shows  
(a) Bathochromic shift; (b) Hyperchromic shift; (c) Both of the above; (d) None of the above
- Q.21 Identify the nuclei that is NMR inactive  
(a)  $^{16}\text{O}_8$ ; (b)  $^{14}\text{N}_7$ ; (c)  $^{13}\text{C}_6$ ; (d)  $^{11}\text{B}_5$
- Q.22 Which of the following statement is false?  
(a) Chemical shift of aromatic compounds is very low than alkenes; (b) TMS gives one NMR peak;  
(c)  $^1\text{H}$  NMR is more sensitive than  $^{13}\text{C}$  NMR; (d) Acids will have more chemical shift than alcohols
- Q.23 If more the shielding effect  
(a) No change in chemical shift; (b) Higher the chemical shift;  
(c) Lower the chemical shift; (d) High peak splitting
- Q.24 Which of the following is not used as NMR solvent?  
(a)  $\text{D}_2\text{O}$ ; (b)  $\text{CHCl}_3$ ; (c)  $\text{CCl}_4$ ; (d)  $\text{CDCl}_3$
- Q.25 Which of the following is the simplest form of carbohydrates?  
(a) Carbonyl and polyhydroxy groups; (b) Aldehyde and ketone groups;  
(c) Alcohol and carboxyl groups; (d) Hydroxyl groups and hydrogen groups
- Q.26 Two forms of D-glucofuranose, are called.  
(a) Enantiomers; (b) Anomers; (c) Epimers; (d) Diastereomers
- Q.27 The smallest carbohydrate is  
(a) Ribose; (b) Glucose; (c) Glyceraldehyde; (d) Dihydroxyacetone
- Q.28 Which of the following is an example of aldopentose?  
(a) Erythrose; (b) Ribose; (c) Fructose; (d) Dihydroxyacetone
- Q.29 The general formula of carbohydrates is  
(a)  $(\text{C}_4\text{H}_2\text{O})_n$ ; (b)  $(\text{C}_6\text{H}_2\text{O})_n$ ; (c)  $(\text{CH}_2\text{O})_n$ ; (d)  $(\text{C}_2\text{H}_2\text{O})_n\text{COOH}$
- Q.30 Which of the following monosaccharides is the majority found in the human body?  
(a) D-type; (b) L-type; (c) L/D-types; (d) none of the above

**PART B (Short answer type questions of 20 marks)**

Q.1(a) Identify the products of the following reactions [2]



Q.1(b) Malachite green is deeper than that of crystal violet - Discuss from their resonance structures. [2]

Q.2(a) Draw the mechanism of radical initiation of styrene by any redox reagents. [2]

Q.2(b) Write short note on spontaneous termination in ionic polymerization. [2]

Q.3(a) What happens when hexamethylenediamine mixed with adipic acid? What is the structural difference between Nomex and Kevlar? [2]

Q.3(b) What are liquid-crystal polymers? What types of structures of polymers exhibit liquid crystalline properties? [2]

Q.4(a) Give one example of determination of geometrical isomers using UV-VIS spectra. [2]

Q.4(b) In  $^1\text{H}$ NMR spectra the proton of ethylene appears at 4-6  $\delta$  but the proton of acetylene appears at 2-3  $\delta$ . Discuss [2]

Q.5 Draw and discuss the mutarotation with an example of D-Glucose. Explain the role of anomeric carbon in the process. [4]

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