



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : Third Semester – 2020

Paper: Chemistry-III (Organic Chemistry)

Course Code: CHEM-201/CHM-21304Part – I (Compulsory) Time: 15Min. Marks: 10

Roll No. in Fig.

Roll No. in Words.

Attempt this Paper on this Question Sheet only.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Signature of Supdt.:

Q.1. Encircle the right answer cutting and overwriting is not allowed. (10x1=10)

1. Which of the following group is not electron withdrawing by resonance.

- a. CONHCH_3 b. $-\text{CHO}$ c. $-\text{COOH}$ d. $-\text{OCH}_3$

2. The Ter-butyl Alcohols on treatment with H_2SO_4 gives a product.

- a. Ketone b. Alkene c. Alkane d. Aldehyde

3. Grignard reagent reacts readily with ethylene oxide to give:

- a. Ketone b. Alcohol c. Acid d. Aldehyde

4. Which of the following alkyl halide undergo $\text{S}_\text{N}1$ reaction via the formation of carbocation.

- a. 2-chloro-2-methyl propane b. 2-chlorobutane
c. 1-chloro-3,3-dimethyl pentane d. 2-chloro-2-methyl propane

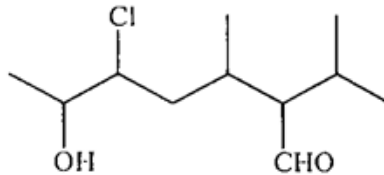
5. According to Huckel rule, a cyclic polyene system would be aromatic if it possess:

- a. $2n+4\pi e^-$ b. $2n+2\pi e^-$ c. $4n+2\pi e^-$ d. $4n\pi e^-$

6. Appropriate hybridization schemes for the C atoms in molecular $\text{CH}_3\text{CO}_2\text{H}$ are:

- a. sp^2 and sp^2 b. sp^2 and sp^3 c. sp^3 and sp^2 d. sp^3 and sp^3

7. How many stereo centers are present in a compound shown below?



- (a) 2 (b) 3 (c) 4 (d) 5

8. Addition of HBr to 1-butene in the presence of peroxide gives.

- a. 1,2-dibromobutane b. 1-bromobutane c. 2-bromobutane d. 2,2-dibromobutane

9. Oxidation of n-propyl alcohol with Jones reagent would give.

- a. Propanoic acid b. Propanal c. Propanol d. Propane

10. Which is IUPAC name of the given compound $\text{CH}_3\text{-CH}_2\text{-CH=CH-CHO}$.

- a. Crotonaldehyde b. Pent-2-enal c. Penten-1-al d. Pent-2-ene-1-al



ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Give short answers of the following:

- (a) Explain why ethanol (78°C) has a higher boiling than that of dimethyl ether (-25°C). (2)
- (b) How would you differentiate terms resonance, conjugation and aromaticity. (6)
- (c) What is difference between atomic orbital and molecular orbital. (2)
- (d) Why nitroacetic acid is more acidic than 2-hydroxyacetic acid. (2)
- (e) Why dipole moment of CO₂ is zero while that of cis-dichloroethene is $\mu = 1D$. (2)
- (f) Why cyclopentadienyl cation is antiaromatic and cyclopentadienyl anion is aromatic. (2)
- (g) How will you prepare n-butane by Corey-House reaction. (2)
- (h) Why nitro group is deactivating and meta directing. (2)

Q3.(a) How would you distinguish between Primary, Secondary and tertiary alcohols by chemical tests and also write chemical equations. (6)

(b) Design suitable syntheses of the following compounds starting from benzene. Show all the steps in each case. (10)

- (i) 2-chlorobenzoic acid (ii) 1-methyl-3-nitrobenzene (iv) Benzophenone
- (iii) 4-bromo-3-nitrobenzoic acid (v) 2-bromo-1-methyl-4-nitrobenzene

(c) Explain mechanism and stereochemistry of S_N1 reaction and also discuss effect of leaving group, nature of nucleophile, substrate and solvent on rate of S_N1 reaction. (8)

(d) Draw the structural formula of the following compounds. (6)

- (i) Isobutylene (ii) 3-ethyl-4-isopropyl-1-heptene (iii) 2,6-dimethylcyclohexanone
- (vi) 3-oxopentanal (v) 6-methyl-5-hepten-2-ol (vi) *p*-toluenesulfonic acid