Unit Test 5

• Haloalkanes and Haloarenes • Alcohols, Phenols and Ethers • Aldehydes, Ketones and Carboxylic Acids • Organic Compounds Containing Nitrogen • Biomolecules • Polymers • Chemistry in Everyday Life

Unit test is complementary part of the learning process. It gives you a total insight whether the learning outcomes have been achieved or not. After doing daywise preparation, attempt these questions in exam like environment. This will assist you in finding particular area of weakness to work upon. An OMR sheet is given at the end to fill the correct answers.

All the Best!

Max. Marks : 180 **Time : 45 min.**

1. Preparation of alkyl halides in laboratory is least preferred by
(a) halide exchange
(b) treatment of alcohols
(c) addition of hydrogen halides to alkanes
(d) direct halogenation of alkanes

2. The main product of the given reaction would be

$$\text{2-butene + chloroform} \xrightarrow[\text{Hydrolysis}]{\text{NaOH}}$$

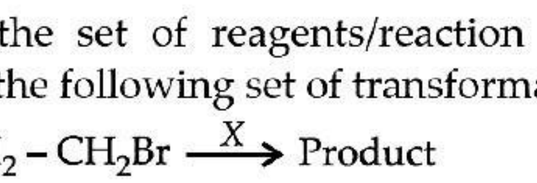
(a) butanoic acid
(b) 2-methylbutanoic acid
(c) 1,1,1-trichloro-2-methylbutane
(d) 1,4-butanediol

3. Identify the set of reagents/reaction conditions *X* and *Y* in the following set of transformations.

$$CH_3-CH_2-CH_2Br \xrightarrow{X} \text{Product} \xrightarrow{Y} CH_3-\underset{\underset{Br}{|}}{CH}-CH_3$$

(a) *X* = dilute aqueous NaOH, 20°C,
Y = HBr/acetic acid, 20°C
(b) *X* = concentrated alcoholic NaOH, 80°C,
Y = HBr/acetic acid, 20°C
(c) *X* = dilute aqueous NaOH, 20°C,
Y = $Br_2/CHCl_3$, 0°C
(d) *X* = concentrated alcoholic NaOH, 80°C,
Y = $Br_2/CHCl_3$, 0°C

4. Predict the correct stereoisomeric product for the following reaction.



(a) *d*-form (b) *l*-form
(c) racemic mixture (d) *meso* form

5. *o*-Chlorotoluene can undergo
(i) electrophilic aromatic substitution
(ii) nucleophilic aromatic substitution
(iii) nucleophilic aliphatic substitution
(iv) free radical substitution
(a) only (i) (b) (i) and (iv)
(c) (i), (ii) and (iv) (d) all the four.

6. Some statements are given below about ethers :
1. Oxygen atom is sp^3-hybridised
2. They are liquids at room temperature
3. They are miscible with water
4. They are very active.

Among the above, correct statement(s) is/are
(a) only 1 (b) only 3 and 4
(c) only 1 and 2 (d) 1, 2 and 3

7. Which of the following statements is false?
(a) Artificial silk is derived from cellulose.
(b) Nylon-66 is an example of elastomer.
(c) The repeat unit in natural rubber is isoprene.
(d) Both starch and cellulose are polymers of glucose.

8. The metals present in insulin, haemoglobin and vitamin B_{12} are respectively
(a) Zn, Hg, Cr (b) Co, Fe, Zn
(c) Mg, Fe, Co (d) Zn, Fe, Co

9. Synthesis of each molecule of glucose in photosynthesis involves
(a) 6 molecules of ATP
(b) 18 molecules of ATP
(c) 10 molecules of ATP
(d) 8 molecules of ATP

10. When calcium acetate and calcium formate together are subjected to dry distillation, the product is
(a) acetaldehyde (b) acetone
(c) formaldehyde (d) none of these.

11. Relative acidity of the following is in the order
(a) $RCOOH > H_2CO_3 > C_6H_5OH > H_2O > ROH$
(b) $RCOOH > ROH > H_2CO_3 > C_6H_5OH > H_2O$
(c) $ROH > RCOOH > H_2CO_3 > C_6H_5OH > H_2O$
(d) $RCOOH > C_6H_5OH > ROH > H_2CO_3 > H_2O$

12. Compound $P(C_5H_{10}O)$ forms phenyl hydrazone and gives a negative Tollen's and iodoform test Compound *P* on reduction gives *n*-pentane. The compound *P* will be

(a) $H-\overset{\overset{O}{\|}}{C}-CH_2-CH_2-CH_2-CH_3$

(b) $H_3C-\overset{\overset{O}{\|}}{C}-CH_2-CH_2-CH_3$

(c) $H_3C-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$

(d) None of the above.

13. Which of the following compounds can be classified as aryl halides?

(a) p-$ClC_6H_4CH_2CH(CH_3)_2$

(b) p-$CH_3CHCl(C_6H_4)CH_2CH_3$

(c) o-$BrH_2C(C_6H_4)CH(CH_3)CH_2CH_3$

(d) $C_6H_5CH_2Cl$

14. In the following reaction,

$C_6H_5CH_2Br \xrightarrow[(ii)\ H_3O^+]{(i)\ Mg,\ ether} X$. The product '$X$' is

(a) $C_6H_5CH_2OCH_2C_6H_5$

(b) $C_6H_5CH_2OH$

(c) $C_6H_5CH_3$

(d) $C_6H_5CH_2CH_2C_6H_5$

15. The conversion of ethanol to propane nitrile (CH_3CH_2CN) is best carried out by

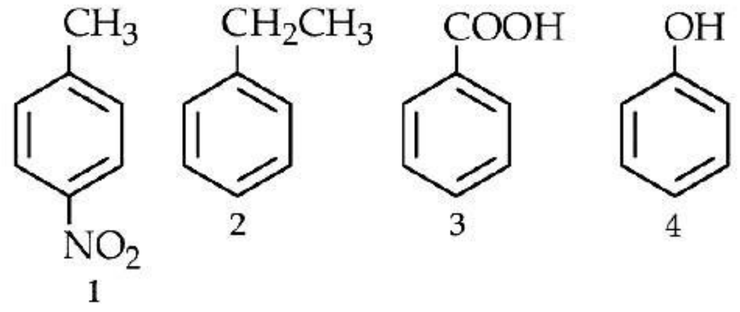
(a) $CH_3CH_2CH_2OH + KCN \xrightarrow{\Delta}$

(b) $CH_3CH_2OH + HCN \xrightarrow{\Delta}$

(c) $CH_3CH_2OH \xrightarrow[Pyr.]{TsCl} CH_3CH_2OTs \xrightarrow{KCN}$

(d) $CH_3CH_2OH + CH_3CN \xrightarrow{\Delta}$

16. Which will undergo Friedel-Crafts alkylation reaction?



(a) 1, 2 and 4 (b) 1 and 3

(c) 2 and 4 (d) 1 and 2

17. Which of the following is an example of S_N2 reaction?

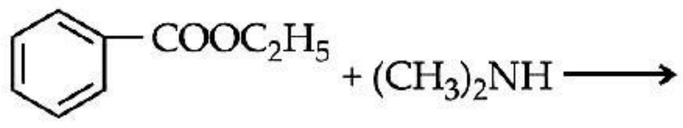
(a) $CH_3Br + OH^- \longrightarrow CH_3OH + Br^-$

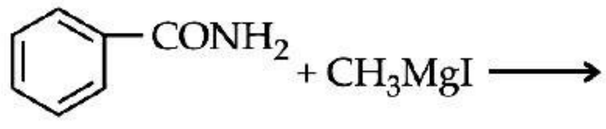
(b) $CH_3-\underset{\underset{Br}{|}}{CH}-CH_3 + OH^- \longrightarrow CH_3-\underset{\underset{OH}{|}}{CH}-CH_3 + Br^-$

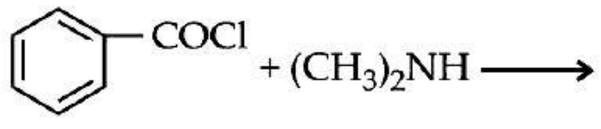
(c) $CH_3CH_2OH \xrightarrow{-H_2O} CH_2=CH_2$

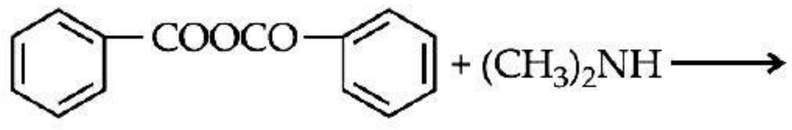
(d) $(CH_3)_3C-Br + OH^- \longrightarrow (CH_3)_3C-OH + Br^-$

18. Which of the following reactions will not give *N*, *N*-dimethylbenzamide?

(a)  $+ (CH_3)_2NH \longrightarrow$

(b)  $+ CH_3MgI \longrightarrow$

(c)  $+ (CH_3)_2NH \longrightarrow$

(d)  $+ (CH_3)_2NH \longrightarrow$

19. Find the incorrect statement.

(a) In an aqueous solution, only a very little fraction of glucose exists as open chain aldose.

(b) Galactose is the epimer of glucose.

(c) Sucrose is a leavorotatory sugar.

(d) Fructose gives positive Fehling's test.

20. A β-pleated sheet

(a) has $\diagdown C=O$ and N—H bonds in different planes.

(b) $-R$ groups are oriented above the plane of the sheet only.

(c) can have antiparallel as well as parallel arrangement.

(d) shows hydrogen bonding between N—H and $\diagdown C=O$ groups of alternate amino acid residues.

21. A compound A has a molecular formula C_7H_7NO. On treatment with Br_2 and KOH, A gives an amine B which gives carbylamine test. B upon diazotisation and coupling with phenol gives an azo dye. A can be

(a) $C_6H_5CONHCOCH_3$

(b) $C_6H_5CONH_2$

(c) $C_6H_5NO_2$

(d) o-, m- or p-$C_6H_4(NH_2)CHO$.

22. What form of glutamic acid would you expect to predominate in a strongly base solution?

(a) $H_3\overset{+}{N}-\underset{\underset{CH_2CH_2COOH}{|}}{CH}-COOH$

(b) $H_2N-\underset{\underset{CH_2CH_2COO^-}{|}}{CH}-COO^-$

(c) $H_3\overset{+}{N}-\underset{\underset{CH_2CH_2COOH}{|}}{CH}-COO^-$

(d) All of these are stable.

23. An organic compound (A) on reduction gives a compound (B) which on reaction with $CHCl_3$ and NaOH form (C). The compound (C) on catalytic reduction gives N-methylaniline. The compound A is

(a)

(b)

(c)

(d)

24. Given are cyclohexanol (I), acetic acid (II), 2,4,6-trinitrophenol (III) and phenol (IV). In these, the order of decreasing acidic character will be

(a) III > II > IV > I

(b) II > III > I > IV

(c) II > III > IV > I

(d) III > IV > II > I

25. Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains
(a) mixture of *o*- and *m*-bromotoluenes
(b) mixture of *o*- and *p*-bromotoluenes
(c) mixture of *o*- and *p*-dibromobenzenes
(d) mixture of *o*- and *p*-bromoanilines.

26. In the reaction, $A \xrightarrow{KCN} B \xrightarrow{[H]} C_2H_5NH_2$
(a) *A* is CH_3I
(b) *B* is CH_3NC
(c) *A* is C_2H_5I
(d) *B* is C_2H_5NC

27. Phenol can be prepared by the reaction between
(a) aniline and HNO_3 at 373 K
(b) C_6H_5MgBr and CO_2 followed by hydrolysis
(c) C_6H_5Cl and NaOH at 373 K
(d) $C_6H_5SO_3Na$ and NaOH at 573-623 K followed by acidification

28. If one strand of DNA has the sequence ATGCTTGA, the sequence in the complimentary strand would be
(a) TACGAACT
(b) TCCGAACT
(c) TACGTACT
(d) TACGTAGT

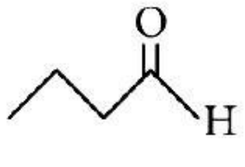
29. Which of the following is not a test for proteins?
(a) Biuret test
(b) Millons test
(c) Lipoprotein test
(d) Sakaguchi test

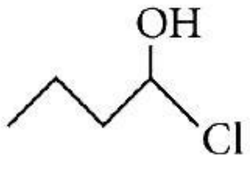
30. Phenol is
(a) a base weaker than NH_3
(b) an acid stronger than carbonic acid
(c) an acid weaker than carbonic acid
(d) neutral.

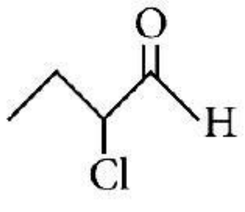
31. An ether is more volatile than an alcohol having the same molecular formula. This is due to
(a) Dipolar character of ethers
(b) Alcohols having resonance structure
(c) Intermolecular hydrogen bonding in ethers
(d) Intermolecular hydrogen bonding is alcohols.

32. Butanoic acid is treated with PCl_5. The organic product obtained from this reaction is made to react with H_2 gas in the presence of palladium supported on solid $BaSO_4$ and mixed with a small amount of sulphur. The end product of this reaction is

(a) 

(b) 

(c) 

(d) 

33. Which of the following will not give iodoform test ?
(a) $C_6H_5COCH_3$
(b) CH_3COCH_3
(c) CH_3CH_2OH
(d) $CH_3-\overset{\overset{O}{\|}}{C}-Cl$

34. Eye lenses are manufactured by using
(a) teflon (b) acrilan
(c) lucite (d) dextron

35. The detergent used in hair conditioner is
(a) $CH_3(CH_2)_{15}\overset{+}{N}(CH_3)_3Cl^-$
(b) $CH_3(CH_2)_{15}NH_2$
(c) $CH_3(CH_2)_{15}NHCH_3$
(d) $CH_3(CH_2)_{15}N(CH_3)_2$

36. Nylon-6, 6 is a strong crystalline fibre due to the presence of
(a) Covalent bonds
(b) Hydrogen bonds
(c) Ionic bonds
(d) van der Waals attractive forces

37. Which of the following contains vitamin D?
(a) Calciferol (b) Keratin
(c) Tocopherol (d) None

38. Synthetic human hair wigs are made from a copolymer of vinyl chloride and acrylonitrile and is called
(a) PVC (b) polyacrylonitrile
(c) cellulose (d) dynel

39. Glycogen is a branched polymer of
(a) α-glucose (b) β-glucose
(c) α-fructose (d) none of these.

40. Which of the following statements about the disaccharide sucrose is incorrect?
(a) It contains glucose in the furanose form and fructose in the pyranose.
(b) It forms an octaacetate.
(c) It is a non-reducing sugar.
(d) On acid hydrolysis it gives invert sugar.

41. For the given reaction,
$CH_3CHO + HCN \longrightarrow \xrightarrow{H_3O^+}$
The product is a
(a) mixture of 1 : 1 enantiomers of acid
(b) mixture of 1 : 1 diastereomers of acid
(c) mixture of 1 : 2 enantiomers of acid
(d) mixture of 1 : 1 enantiomers of aldehyde

42. Which of the suggested tests can be used to differentiate the given compounds?
(a) 1° and 2° amine (carbylamine test)
(b) CH_3CHO and CH_3CH_2CHO (Tollen's test)
(c) CH_3OH and CH_3CH_2OH (Lucas test)
(d) CH_3COCH_3 and $CH_3CH_2COCH_3$ (Brady's reagent)

43. Identity (X) in the sequence.

$$C_3H_8O \xrightarrow[H_2SO_4]{K_2Cr_2O_7} C_3H_6O \xrightarrow[\text{Warm}]{I_2 + NaOH} CHI_3$$
(X)

(a) $CH_3 - CH_2 - CH_2OH$

(b) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

(c) $CH_3 - O - CH_2 - CH_3$

(d) $CH_3 - CH_2 - CHO$

44. Among the following elastomers are

(1) natural rubber (2) bakelite

(3) Buna-*S* (4) dacron

(a) 2 and 4 (b) 3 and 2

(c) 1 and 4 (d) 1 and3

45. Among the following, the strongest acid is

(a) CH_3COOH

(b) CH_2ClCH_2COOH

(c) $CH_2ClCOOH$

(d) CH_3CH_2COOH

UNIT TEST 5 OMR SHEET

Time : 45 min

INSTRUCTIONS

- Use HB pencil only and darken each circle completely.
- If you wish to change your answer, erase the already darkened circle completely and then darken the appropriate circle.
- Mark only one choice for each question as indicated.

Correct marking ● ⓑ ⓒ ⓓ

Wrong marking ⊗ ✓ ◑ ⊙

1. ⓐ ⓑ ⓒ ⓓ	10. ⓐ ⓑ ⓒ ⓓ	19. ⓐ ⓑ ⓒ ⓓ	28. ⓐ ⓑ ⓒ ⓓ	37. ⓐ ⓑ ⓒ ⓓ
2. ⓐ ⓑ ⓒ ⓓ	11. ⓐ ⓑ ⓒ ⓓ	20. ⓐ ⓑ ⓒ ⓓ	29. ⓐ ⓑ ⓒ ⓓ	38. ⓐ ⓑ ⓒ ⓓ
3. ⓐ ⓑ ⓒ ⓓ	12. ⓐ ⓑ ⓒ ⓓ	21. ⓐ ⓑ ⓒ ⓓ	30. ⓐ ⓑ ⓒ ⓓ	39. ⓐ ⓑ ⓒ ⓓ
4. ⓐ ⓑ ⓒ ⓓ	13. ⓐ ⓑ ⓒ ⓓ	22. ⓐ ⓑ ⓒ ⓓ	31. ⓐ ⓑ ⓒ ⓓ	40. ⓐ ⓑ ⓒ ⓓ
5. ⓐ ⓑ ⓒ ⓓ	14. ⓐ ⓑ ⓒ ⓓ	23. ⓐ ⓑ ⓒ ⓓ	32. ⓐ ⓑ ⓒ ⓓ	41. ⓐ ⓑ ⓒ ⓓ
6. ⓐ ⓑ ⓒ ⓓ	15. ⓐ ⓑ ⓒ ⓓ	24. ⓐ ⓑ ⓒ ⓓ	33. ⓐ ⓑ ⓒ ⓓ	42. ⓐ ⓑ ⓒ ⓓ
7. ⓐ ⓑ ⓒ ⓓ	16. ⓐ ⓑ ⓒ ⓓ	25. ⓐ ⓑ ⓒ ⓓ	34. ⓐ ⓑ ⓒ ⓓ	43. ⓐ ⓑ ⓒ ⓓ
8. ⓐ ⓑ ⓒ ⓓ	17. ⓐ ⓑ ⓒ ⓓ	26. ⓐ ⓑ ⓒ ⓓ	35. ⓐ ⓑ ⓒ ⓓ	44. ⓐ ⓑ ⓒ ⓓ
9. ⓐ ⓑ ⓒ ⓓ	18. ⓐ ⓑ ⓒ ⓓ	27. ⓐ ⓑ ⓒ ⓓ	36. ⓐ ⓑ ⓒ ⓓ	45. ⓐ ⓑ ⓒ ⓓ

(1) Number of questions attempted : _____ (3) Marks scored : _____

(2) Number of questions correct : _____

For every correct answer award yourself 4 marks. For every incorrect answer deduct 1 mark.

ANSWER KEYS (Unit Tests)

Unit Test 5

1.	(d)	**2.**	(b)	**3.**	(b)	**4.**	(c)	**5.**	(c)	**6.**	(d)	**7.**	(b)	**8.**	(d)	**9.**	(b)
10.	(a)	**11.**	(a)	**12.**	(c)	**13.**	(a)	**14.**	(c)	**15.**	(c)	**16.**	(c)	**17.**	(a)	**18.**	(b)
19.	(c)	**20.**	(c)	**21.**	(b)	**22.**	(b)	**23.**	(a)	**24.**	(a)	**25.**	(b)	**26.**	(a)	**27.**	(d)
28.	(a)	**29.**	(c)	**30.**	(c)	**31.**	(d)	**32.**	(b)	**33.**	(d)	**34.**	(c)	**35.**	(a)	**36.**	(b)
37.	(a)	**38.**	(d)	**39.**	(a)	**40.**	(a)	**41.**	(a)	**42.**	(a)	**43.**	(b)	**44.**	(d)	**45.**	(c)