

multiple choice questions (choose the correct option)

- ① The range of UV light is
- (a) 500 - 1000 nm (b) 10 - 400 nm.
 (c) 1000 - 1500 nm (d) 1500 - 2000 nm
- ② The relation between λ , ν and c is
- (a) $\lambda \times \nu = c$ (b) $\nu \times c = \lambda$
 (c) $\lambda \times c = \nu$ (d) $\lambda \times \nu \times c = 1$
- ③ The equation $\log_{10} \frac{I_0}{I} = \epsilon c l$ is an expression of
- (a) Beer's law (b) Lambert's law
 (c) Beer - Lambert's law (d) Hooke's law.
- ④ Introduction of an auxochrome into a system brings about an increase in the intensity absorption. This is called as.
- (a) hypsochromic effect (b) bathochromic shift
 (c) hypochromic effect (d) hyperchromic effect.
- ⑤ Introduction of an auxochrome into a system brings about a decrease in the intensity absorption. This is called.
- (a) hypsochromic effect (b) bathochromic shift
 (c) hypochromic effect (d) hyperchromic effect.

6) The shift of absorption of light towards higher wavelength is known as

- (a) hypsochromic shift (b) bathochromic shift
(c) hyperchromic shift (d) hypochromic shift

7) The shift of absorption maximum towards shorter wavelength by removing conjugation from a system is called

- (a) hypsochromic shift (b) bathochromic shift
(c) hyperchromic shift (d) hypochromic shift

8) Increasing order of UV absorption maxima of ethylene, butadiene and naphthalene is

- (a) butadiene < naphthalene < ethylene
(b) ethylene < naphthalene < ~~ethylene~~ butadiene
(c) ethylene < butadiene < naphthalene
(d) naphthalene < butadiene < ethylene.

9) Which of the following cannot be detected with the help of UV absorption spectra?

- (a) conjugation (b) functional group.
(c) Geometrical isomerism. (d) optical isomerism.

10) Which of the following is chromophore?

- (a) -OH (b) -NH₂ (c) -SH (d) -C≡N.

11) Which of the following is auxochrome?

- (a) >C=C< (b) $\text{-C}\equiv\text{C-}$ (c) $\text{-C}\equiv\text{N}$ (d) $\text{-}\ddot{\text{O}}\text{(CH}_3\text{)}$

12) The λ_{max} of the following compound is ?



- (a) 234 nm (b) 253 nm (c) 214 nm
(d) 224 nm.

13) Base value of homoannular diene is ...

- (a) 253 nm (b) 214 nm (c) 217 nm (d) 215 nm.

14) The λ_{max} of the cyclohexadiene is ...

- (a) 263 nm (b) 224 nm (c) 227 nm (d) 253 nm.

15) IR radiation have a range of.

- (a) 4000 - 667 cm^{-1} . (b) 400 - 10 cm^{-1} .
(c) 4000 - 10000 cm^{-1} (d) 200 - 400 cm^{-1}

16) Aldehyde group show IR absorption frequency in the range of.

- (a) 3300 cm^{-1} (b) 3010 - 3100 cm^{-1} (c) 3000 cm^{-1} .
 (d) 2650 - 2880 cm^{-1}

17) Hooke's law for the vibration of a diatomic molecules may be represented as.

- (a) $\nu = \frac{1}{2\pi c} \sqrt{\frac{k}{\mu}}$ (b) $\nu = \frac{1}{2\pi c} \sqrt{\frac{\mu}{k}}$.
(c) $\nu = \frac{1}{2\pi \mu} \sqrt{\frac{k}{c}}$ (d) $\nu = \frac{1}{2\pi \mu} \sqrt{\frac{c}{k}}$.

18) which type of energy transition is shown IR-spectrum.

- (a) Rotational (b) vibrational (c) Bond-breaking
(d) electronic

19) which is of the following is bending vibration

- (a) scissoring & rocking (b) wagging & twisting
(c) a & b (d) None of these.

20) 2250 cm^{-1} is base value for the absorption of bonds (IR spectroscopy)

- (a) O-H (b) N-H (c) C-H (d) C≡N

21) what is the base value for absorption of C=O bond (in IR-spectroscopy)

- (a) 1100 cm^{-1} (b) 1650 cm^{-1} (c) 1715 cm^{-1} (d) 2150 cm^{-1}

22) what is the correct increasing order of stretching frequencies for C≡C, C=C & C-C

- (a) C-C > C=C > C≡C (b) C≡C > C=C > C-C
(c) C≡C < C-C > C=C

23) C=O stretching frequency of ester show at

- (a) 1750 cm^{-1} (b) 1690 cm^{-1} (c) 1715 cm^{-1}
(d) 1700 cm^{-1}

24) O-H absorption frequency of acid show at

- (a) $3400 - 2400 \text{ cm}^{-1}$ (b) 3600 cm^{-1} (c) 3650 cm^{-1}
(d) None of these.

The functional group region in IR spectroscopy is

(a) 1500 - 4000 cm^{-1} (b) 600 - 1500 cm^{-1} .

(c) 200 - 600 cm^{-1} (d) 10 - 200 cm^{-1} .

(26) The fingerprint region in IR spectroscopy is

(a) 1500 - 4000 cm^{-1} (b) 600 - 1500 cm^{-1} .

(c) 200 - 600 cm^{-1} (d) 10 - 200 cm^{-1}

(27) The C-O stretching frequency of tertiary alcohol is ---

(a) 1050 cm^{-1} (b) 1100 cm^{-1} (c) 1150 cm^{-1} (d) 1200 cm^{-1} .

(28) The C-O stretching frequency of phenol is ---

(a) 1050 cm^{-1} (b) 1100 cm^{-1} (c) 1150 cm^{-1} (d) 1200 cm^{-1} .

(29) $\text{C}\equiv\text{C}-\text{H}$ stretching frequency of alkynes is

(a) 3300 cm^{-1} (b) 3010 cm^{-1} (c) 2860 cm^{-1} (d) 2970 cm^{-1} .

(30) $\text{C}=\text{C}-\text{H}$ stretching frequency of alkene is

(a) 3300 cm^{-1} (b) 3010 cm^{-1} (c) 2860 cm^{-1} (d) 2970 cm^{-1} .

(31) which compound will show maximum IR absorption frequency of (C=O stretch)

(a) acetone (b) ethyl/methyl ketone (c) acetaldehyde

(d) ethyl acetate.

32) How many NMR signals would be given by the compound:



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

33) which substance is taken as a standard for recording chemical shift.

(a) Dimethyl silane (b) Tetramethylsilane

(c) Trimethylsilane (d) methylsilane.

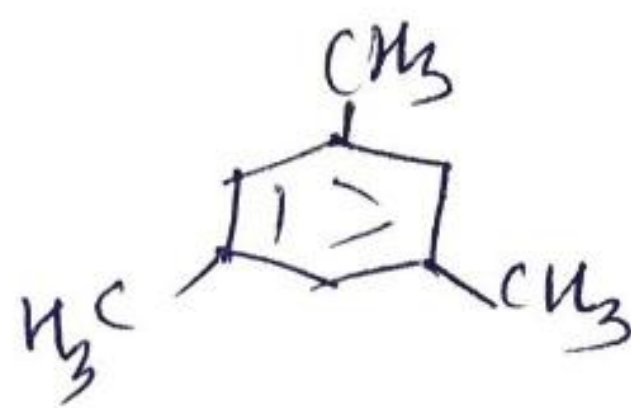
34) If a proton is linked to some electronegative atom in the form of hydrogen bond, absorption will occur.

(a) unchanged (b) upfield (c) downfield (d) cannot say

35) If the chemical shift on the δ scale is 4.4 then on τ scale would be.

(a) -4.4 (b) $\frac{1}{4.4}$ (c) 5.6 (d) -5.6

36) How many NMR signals are expected from the following compounds:



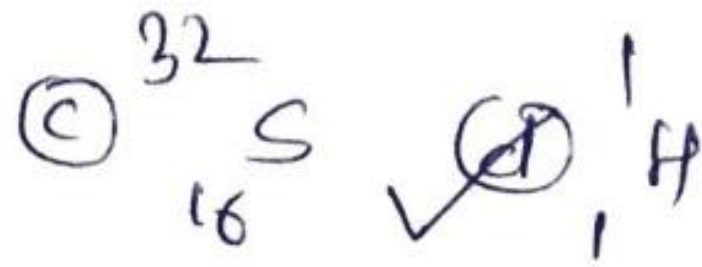
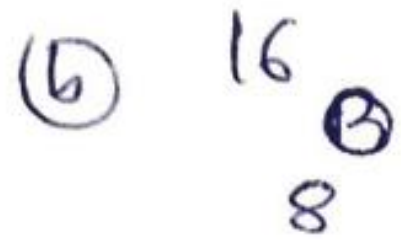
(a) 2 (b) 3 (c) 4 (d) 1

37) which of the following statement regarding NMR data is not correct?

(a) acetone shows one peak (b) methanol shows two peaks (c) cyclobutane show one peak.

(d) Ethylamine show two peaks.

which of the following show magnetic properties in NMR spectroscopy.



(39) proton in a molecule having the same environment absorb at the same magnetic field strength, such proton are called - - -

✓ (a) Equivalent proton (b) Non-equivalent proton

(c) Both (a) & (b) (d) None of these.

(40) proton which have different environment absorb at different magnetic fields, such proton are called

(a) Equivalent proton ✓ (b) non-equivalent proton

(c) Both (a) & (b) (d) None of these.

(41) The chemical shift is denoted by - - -

✓ (a) δ (b) J (c) δ & J (d) None of these.

(42) The coupling constant is denoted by - - -

(a) δ ✓ (b) J (c) δ & J (d) None of these

(43) what signals do you expect to see in the ^1H NMR spectrum of 1,1-dichloroethane $\text{CH}_3\text{-CH-Cl}_2$?

(a) A singlet & a doublet (b) A singlet & quartet

(c) A doublet & a triplet ✓ (d) A doublet & quartet.

(44) for a nucleus with nuclear spin quantum number $I = 1/2$, what are the values of m_I ?

- (a) $+1/2, 0$ (b) $+1/2, -1/2$ (c) $+1/2, +1$ (d) $0, +1$

(45) which of the following gives only spin active nuclei?

- (a) ^1_1H (b) $^{12}_6\text{C}$ (c) $^{16}_8\text{O}$ (d) $^{32}_{16}\text{S}$

(46) upon hydrolysis, proteins give.

- (a) amino acids (b) hydroxy acids.
(c) fatty acids (d) alcohols

(47) An aqueous solution of glycine is neutral because of the formation of:

- (a) carbanion (b) zwitterion (c) carbonium ions.
(d) free radicals.

(48) The isoelectric point of protein is

- (a) the pH at which the protein molecule has no charges on its surface.
 (b) The pH at which a protein in solution has an equal number of positive and negative charge.
(c) the electric charge under isothermal condition
(d) none of these

(49) Glycine is

- (a) $\text{NH}_2\text{-CH}_2\text{-COOH}$ (b) $\text{H}_2\text{N-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-NH}_2$
(c) $\text{NO}_2\text{-CH}_2\text{-CH}_2\text{-COOH}$ (d) $\text{Br-CH}_2\text{-COOH}$

A zwitterion is

- (a) an ion that is positively charged in solution.
- (b) an ion that is negatively charged in solⁿ.
- ✓ (c) a compound that can ionise both as a base & an acid.
- (d) a carbohydrate with an electrical charge.

(51) The pH at which the amino acid shows no tendency to migrate when placed in an electric field known as its!

- ✓ (a) isoelectric point
- (b) dipole moment
- (c) iodine number
- (d) wavelength.

(52) Glycine react with nitrous acid to form.

- ✓ (a) glycollic acid
- (b) diketopiperazine.
- (c) methylamine
- (d) ethyl alcohol

(53) which of the following organic ion results when glycine is treated with conc. HCl.?

- ✓ (a) $\text{NH}_3^+\text{CH}_2\text{COOH}$
- (b) $\text{NH}_2\text{-CH}_2\text{CO}^-$
- (c) $\text{NH}_3^+\text{-CH}_2\text{-COO}^-$
- (d) $\text{HO-CH}_2\text{CO}^-$

(54) complete hydrolysis of proteins produces:

- (a) ammonia and carbon dioxide
- (b) urea & uric acid
- ✓ (c) a mixture of amino acid
- (d) glycogen and a fatty acid.

(55) The protection of the -NH_2 group of the amino acid with - - -

- (a) Benzyl alcohol
- ✓ (b) carbobenzoxy chloride
- (c) Both (a) & (b)
- (d) None of these

56) The protection of α -COOH group in amino acid with

- (a) benzyl alcohol (b) carbobenzoxy chloride
(c) both (a) & (b) (d) None of these.

57) Which of following catalyst use as the synthesis of peptide?

- (a) DCC (b) PCC (c) NaBH_4
(d) NaOH.

58) The condensation of two amino acid molecules is called as

- (a) dipeptide (b) Tripeptide (c) polypeptide.
(d) Amino acid.

59) Amino acid having one amino and one carboxylic groups are called

- (a) neutral amino acid (b) basic amino acid
(c) Acidic amino acid (d) None of these.

60) Amino acid containing two amino and one carboxylic group are called

- (a) neutral amino acid (b) basic amino acid
(c) Acidic amino acid (d) None of these.

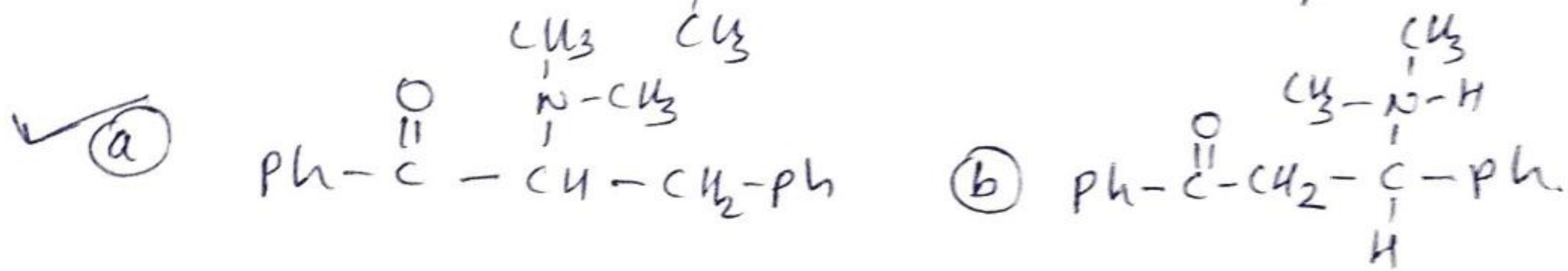
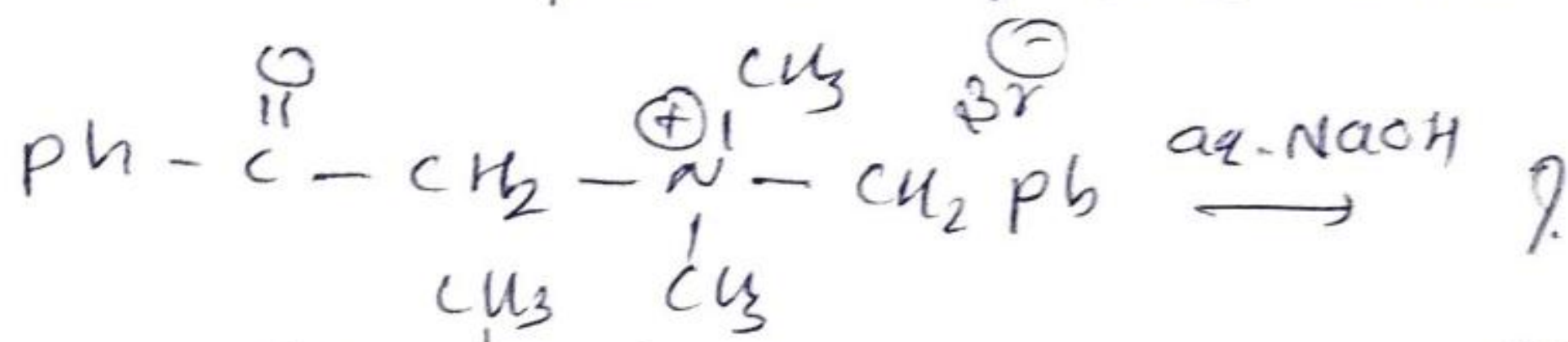
61) Amino acid containing one amino & two carboxylic group are called

- (a) neutral amino acid (b) basic amino acid
 (c) ~~acidic~~ Acidic amino acid (d) None of these

2,3-dimethylbutane-2,3-diol is treated with hot 30% sulfuric acid, 3,3-dimethyl-2-butanone is formed. It is known as - - -

- (a) pinacol-pinacolone rearrangement
- (b) favroski rearrangement.
- (c) Fries rearrangement.
- (d) None of these.

(63) The major product of the following reaction is

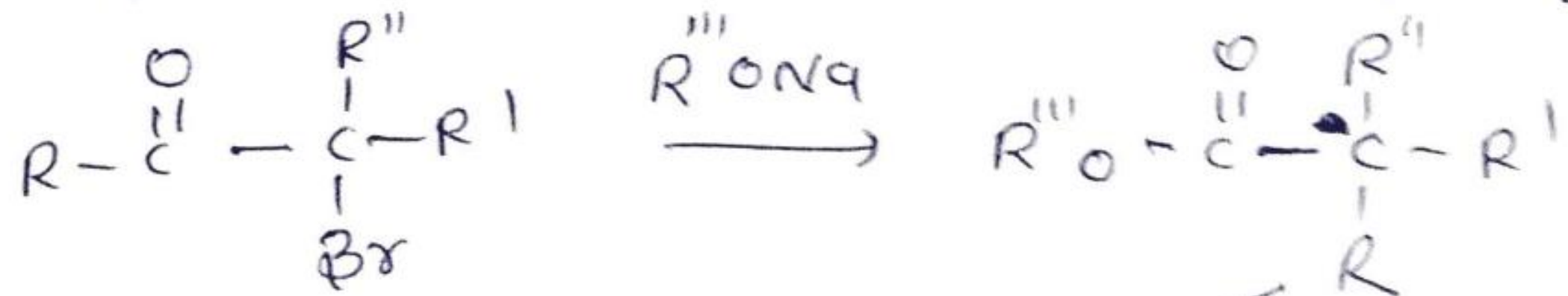


- (c) both (a) & (b)
- (d) None of these.

(64) Rearrangement of allyl aryl ether to o- or p-allylphenols is an example of sigmatropic rearrangement and known as - - -

- (a) photofries rearrangement
- (b) favroski rearrangement
- (c) both (a) & (b)
- (d) None of these.

(65) The following reaction it is an example of - -



- (a) photofries rearrangement
- (b) favroski rearrangement
- (c) both (a) & (b)
- (d) None of these

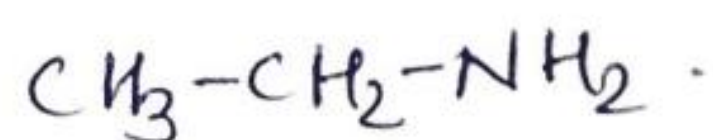
(66) The base-catalysed rearrangement of α -halo-ketone (chloro & bromo) to carboxylic acid derivative is called as

- (a) Stevens rearrangement.
- (b) photofries rearrangement
- (c) Favorskii rearrangement
- (d) None of these.

(67) Acetaldehyde is treated with ammonia & hydrogen cyanide followed by hydrolysis to give

- (a) glycine (b) acetone (c) acetic acid
- (d) None of these.

(68) How many NMR signals are expected from the following compounds:



- (a) 3 (b) 2 (c) 4 (d) 1

(69) If the induced field opposes the applied field, the effective field strength experienced by the protons decreases. The proton is said to be

- (a) shielded (b) deshielded (c) Both (a) & (b)
- (d) None of these

(70) If the induced field reinforces or with the applied field, an enhanced field strength will be experienced by the proton. proton is said to be.

- (a) shielded (b) deshielded (c) Both (a) & (b)
- (d) None of these.