Multiple choice questions (choose the correct option)

(1) The range of U.V. 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 increases 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 an decreases 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) hypsochromic 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 napthalene is ---

(a) butadiene < napthalene < ethylene

(b) ethylene < napthalene < ~~ethylene~~ butadiene

(c) ethylene < butadiene < napthalene

(d) napthalene < 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.

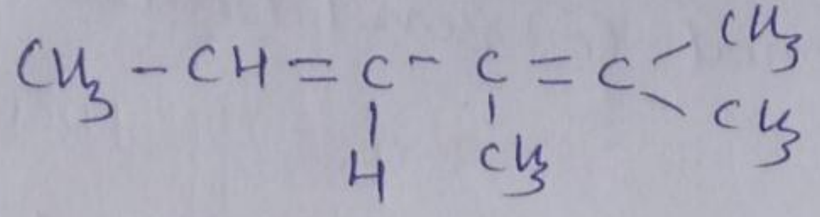
(10) which of the following is chromophore?

(a) -OH (b) $-NH_2$ (c) -SH (d) $-C\equiv N$.

(11) which of the following is auxochrome?

(a) $>C=C<$ (b) $-C\equiv C-$ (c) $-C\equiv N$ (d) $-\ddot{O}CH_3$

(12) The λ_{max} of the following compounds 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 in 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 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 true 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
✓(b) C-C > C=C < C≡C (c) C≡C < C-C > C=C

(23) ;C=O streatching 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 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) C≡C-H stretching frequency of alkynes is

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

(30) $\overset{|}{C}=\overset{|}{C}-H$ 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:

$(CH_3)_2-CH-CH_2-CH_3$

(a) 3 ✓(b) 4 (c) 5 (d) 2.

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

(a) Dimethyl silane ✓(b) Tetramethyl silane

(c) Trimethyl silane (d) methyl silane.

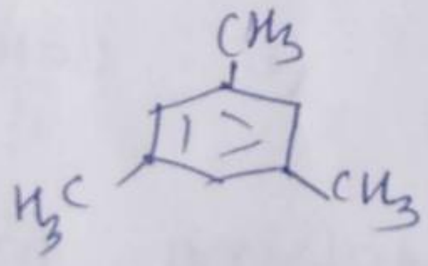
(34) If a proton is linked to some electronegative atom in the form of hydrogen bond, absorption will occur.

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

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

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

(36) How many NMR signal 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.

(a) $^{12}_{6}C$ (b) $^{16}_{8}O$ (c) $^{32}_{16}S$ (d) $^{1}_{1}H$

(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 proten (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 ^{1}H NMR spectrum of 1,1-dichloro ethane $CH_3-CH-Cl_2$?

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

(c) A doublet & a triplet (d) A doublet & a quarted.

(44) for a nucleus with nuclear spin quantum num
$I = 1/2$, 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 is below gives only spin active nuclei?

✓(a) ^{1}H (b) ^{12}C (c) ^{16}O (d) ^{32}S.

(46) In UV spectrum the ε_{max} value is less than 100, that transition called ---- transition.

✓(a) forbidden (b) Allowed

(c) High energy (c) Both b & c

(47) In UV spectrum the ε_{max} value is greter than 100 that transition called---- trensition

(a) forbidden ✓(b) Allowed

(c) High energy (c) Both a & c

(48) In λ_{max} calculation by using scott rule, base value for aromatic ketone is ...

(a) 230 nm ✓(b) 246 nm

(c) 215 nm (d) 202 nm

(49) The number of vibrational degree of freedom possesses by toluene is ...

(a) 45 (b) 30 (c) 36 ✓(d) 39.

(50) The natural abundance of ^{13}C is ...

(a) 11.1 % (b) 99.1 % (c) 98.9 % ✓(d) 1.11 %.

(51) K-band orginate due to ---- trasition.

(a) $n \rightarrow \sigma^*$ (b) $n - \pi^*$ ✓(c) $\pi \rightarrow \pi^*$

(d) $\sigma \rightarrow \sigma^*$

(52) organic molecules are bombarded with electrons and converted to highly energetic positively charged ion is called as. . . .

(a) Molecular ions (b) parents ion

✓(c) Both (a) & (b) (d) None of these

(53) In mass spectroscopy β-cleavage of a bond with γ-hydrogen rearrangement to form a cation radical and a neutral molecule is called - - -

✓(a) Mc lafferty rearrangement (b) fries rearrangement.

(c) claisen rearrangement (d) None of these

(54) The daughter ion square is divided by parent ion, it is known as. . . .

(a) molecular ion ✓(b) metastable ion

(c) parent ion (d) Allot these.

(55) The natural abundance of ^{35}Cl & ^{37}Cl in the ratio of . . . .

✓(a) 3:1 (b) 1:1 (c) 1:2 (d) 1:3.

(56) The natural abundance of ^{79}Br & ^{81}Br in the ratio of . . .

(a) 3:1 (b) 1:3 ✓(c) 1:1 (d) 2:1

(57) Base peak of pentanoic acid m/z is .

✓(a) 60 (b) 43 (c) 15 (d) None of these

(58) In ^{13}C-NMR spectroscopy acetophenone shows ---- peaks.

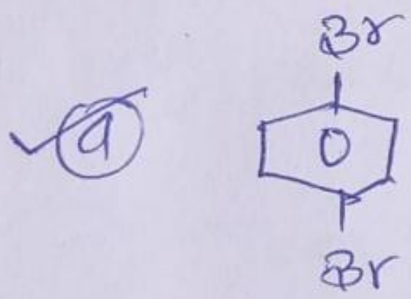
✓(a) 6 (b) 3 (c) 4 (d) 8

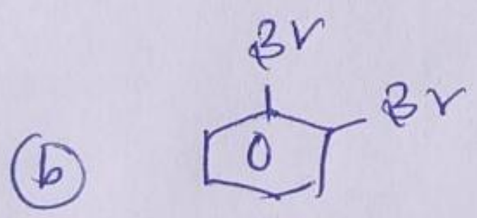
(59) which of the following compounds would be expected to show only a single peak in its ^{13}C-NMR spectrum.

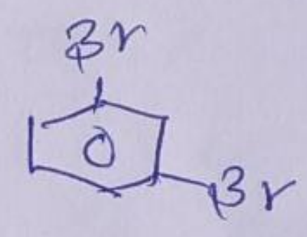
(a) Acetone ✓(b) cyclobutane (c) methyl acetate

(d) Acetaldehyde

(60) which of the following compounds shows TWO CMR signals ?

✓(a) 

(b) 

(c) 

(d)