Rao IIT Academy

Symbol of Excellence and Perfection

Date: 07-05-2015	MEDICAL - UG MH-CET - 2015	Max. Marks : 200 Max. Time : 3 hours

CODE : 11 : ANSWER KEY

PHYSICS

1.	[C]	2.	[B]	3.	[B]	4.	[B]	5.	[D]	6.	[B]
7.	[D]	8.	[D]	9.	[D]	10.	[B]	11.	[C]	12.	[B]
13.	[C]	14.	[B]	15.	[B]	16.	[C]	17.	[B]	18.	[C]
19.	[B]	20.	[D]	21.	[B]	22.	[A]	23.	[B]	24.	[A]
25.	[D]	26.	[A]	27.	[B]	28.	[C]	29.	[A]	30.	[B]
31.	[B]	32.	[A]	33.	[D]	34.	[B]	35.	[B]	36.	[C]
37.	[D]	38.	[D]	39.	[D]	40.	[A]	41.	[C]	42.	[A]
43.	[C]	44.	[B]	45.	[D]	46.	[D]	47.	[B]	48.	[A]
49.	[C]	50.	[C]								

CHEMISTRY

51.	[D]	52.	[A]	53.	[D]	54.	[C]	55.	[C]	56.	[C]
57.	[C]	58.	[A]	59.	[B]	60.	[B]	61.	[A]	62.	[A]
63.	[A]	64.	[B]	65.	[B]	66.	[B]	67.	[C]	68.	[C]
69.	[A]	70.	[C]	71.	[D]	72.	[C]	73.	[D]	74.	[B]
75.	[D]	76.	[B]	77.	[A]	78.	[C]	79.	[A]	80.	[B]
81.	[B]	82.	[B]	83.	[D]	84.	[B]	85.	[D]	86.	[B]
87.	[C]	88.	[D]	89.	[C]	90.	[A]	91.	[C]	92.	[C]
93.	[B]	94.	[A]	95.	[C]	96.	[D]	97.	[B]	98.	[D]
99.	[B]	100.	[B]								

BIOLOGY

101.	[B]	102.	[D]	103.	[B]	104.	[C]	105.	[B]	106.	[D]
107.	[C]	108.	[B]	109.	[D]	110.	[A]	111.	[B]	112.	[A]
113.	[C]	114.	[A]	115.	[C]	116.	[D]	117.	[A]	118.	[D]
119.	[C]	120.	[B]	121.	[D]	122.	[A]	123.	[D]	124.	[A]
125.	[C]	126.	[D]	127.	[C]	128.	[A]	129.	[D]	130.	[A]
131.	[C]	132.	[B]	133.	[D]	134.	[A]	135.	[C]	136.	[D]
137.	[A]	138.	[D]	139.	[A]	140.	[C]	141.	[B]	142.	[D]
143.	[A]	144.	[B]	145.	[A]	146.	[C]	147.	[A]	148.	[B]
149.	[C]	150.	[B]	151.	[A]	152.	[C]	153.	[D]	154.	[C]
155.	[B]	156.	[D]	157.	[B]	158.	[A]	159.	[D]	160.	[A]
161.	[B]	162.	[B]	163.	[D]	164.	[C]	165.	[A]	166.	[B]
167.	[B]	168.	[C]	169.	[A]	170.	[B]	171.	[B]	172.	[A]
173.	[C]	174.	[B]	175.	[D]	176.	[B]	177.	[A]	178.	[C]
179.	[A]	180.	[D]	181.	[D]	182.	[A]	183.	[C]	184.	[D]
185.	[A]	186.	[B]	187.	[D]	188.	[C]	189.	[B]	190.	[A]
191.	[B]	192.	[A]	193.	[C]	194.	[D]	195.	[A]	196.	[D]
197.	[D]	198.	[C]	199.	[C]	200.	[D]				

PHYSICS

Q.1 Energy

Q.2 $V_{\min} = \dfrac{2\pi}{60 \times 60}$

$V_{\sec} = \dfrac{2\pi}{60}$

$\therefore V_{\sec} - V_{\min} = \dfrac{59\pi}{1800} rad/\sec.$

Q.3 elongation $l = \alpha t L$

Force $= Y \alpha t A$

Work done $= \dfrac{1}{2}$ force $\times$ elongation

$= \dfrac{1}{2} Y \alpha t A \times \alpha t L$

$= \dfrac{1}{2} Y \alpha^2 t^2 AL$

Q.4 $f = \dfrac{1}{2L}\sqrt{\dfrac{T}{m}} = n$

$F' = \dfrac{1}{2L}\sqrt{\dfrac{4T}{m}}$

$\boxed{f' = 2 \times f} = 2n$

Q.5 $y = A \sin wt$

$6.25 = 25 \sin \dfrac{2\pi}{3} \cdot t$

$\boxed{t = 0.25 \sec}$

Q.6 $n' = \left(\dfrac{v-0}{v + v_s}\right)^n$

$\dfrac{n'}{n} = \left(\dfrac{v}{v + v_s}\right)$

$\dfrac{5}{6} = \dfrac{350}{350 + v_s}$

$\boxed{v_s = 70\ m/\sec.}$

Q.7 $I = \dfrac{ml^2}{12} + \dfrac{mRL}{4}$

Q.8 $y = a \sin wt$

$$\frac{a}{2} = a \sin \frac{2\pi}{T} \cdot t$$

$$t = \frac{T}{12}$$

Q.9 $\left[M^1 L^0 T^{-3} K^{-4} \right]$

Q.10 $\left(\frac{2p}{2p-1} \right)$

Close pipe has fundamental and odd harmonics.

Q.11 $mgh = \frac{1}{2} I_f \omega^2$

$$mgh = \frac{1}{2} \left\{ I + mr^2 \right\} \omega^2$$

$$\omega = \left(\frac{2mgh}{I + mr^2} \right)^{\frac{1}{2}}$$

Q.12 $mr\omega^2 = F_{max}$

$$m(2l) \left(\frac{2\pi}{T} \right)^2 = F_{max} \qquad \text{.....(1)}$$

also $m(3l) \left(\frac{2\pi}{T_1} \right)^2 = F_{max}$ .....(2)

$\therefore$ solving (1) and (2)

$$T_1 = \sqrt{\frac{3}{2}}\, T$$

Q.13 $n_1 = \frac{V}{2(l_1 + 2e)}$

$\therefore V = 2n_1 (l_1 + 2e)$ ------(1)

also $V = 2n_2 (l_2 + 2e)$ ------(2)

$\therefore$ From (1) & (2)

$$\left[e = \frac{n_2 l_2 - n_1 l_1}{2.(n_1 - n_2)} \right]$$

Q.14 $T = 2\pi\sqrt{\frac{m}{k}}$

$\therefore m = \frac{kT^2}{4\pi^2}$

So $\left[wt = \frac{KT^2 g}{4\pi^2} \right]$

Q.15 $\therefore \frac{GMm}{r^2} = \frac{mr^2}{r}$

$V = \sqrt{\frac{GM}{r}}$

$L = mvr$

$m\sqrt{\frac{GM}{r}} \cdot r$

$L = \left(GMm^2 r\right)^{\frac{1}{2}}$

Q.16 $h\alpha \frac{1}{r}.$

$\frac{h}{h'} = \frac{r'}{r}$

$\frac{1.8}{h'} = \frac{0.9r}{r}$

$\left[h' = 2cm\right]$

Q.17 $\frac{V^2}{r} = k^2 t^2 r$

$\therefore \left[V = ktr\right]$

acc, $a = \left[\frac{dv}{dt} = kr\right]$

$f = m \times a$

$\left[f = mkr\right]$

$P = F \times V$

$mkr \times ktr$

$\left[P = mtk^2 r^2\right]$

Q.18 $\mathrm{KE} = \frac{1}{2}\mathrm{m}\omega^2\left(\mathrm{A}^2 - x^2\right)$

$\mathrm{PE} = \frac{1}{2}\mathrm{m}\omega^2 x^2$

$\therefore \frac{\mathrm{KE}}{\mathrm{PE}} = \frac{\mathrm{A}^2 - x^2}{x^2}$

Q.19 $\mathrm{y} = 9\sin\left(2\pi\mathrm{nt} - \frac{2\pi}{5}x\right)$

for particle velocity

$\frac{\mathrm{dy}}{\mathrm{dt}} = 9 \times 2\pi\mathrm{n}\ \cos\left(2\pi\mathrm{nt} - \frac{2\pi}{5}\mathrm{n}\right)$

$\therefore \mathrm{Vp}_{\max} \rightarrow 2\pi\mathrm{na}$

Now $\frac{2\pi}{\lambda}\mathrm{V} = 2\pi\mathrm{n}$

$[\mathrm{V} = \mathrm{n}\lambda]$ wave velocity

also $\mathrm{K} = \frac{2\pi}{5} = \frac{2\pi}{\lambda}$ progressive constant

$\lambda = 5$

$\therefore [\mathrm{V} = 5\mathrm{n}]$

$\therefore \frac{\mathrm{Vp}_{\max}}{\mathrm{V}} = \frac{2\pi\mathrm{n}}{5\mathrm{n}}$

$= \frac{2\pi\mathrm{a}}{5}$

Q.20 $g_h = g\left(1 - \frac{2h}{R}\right)$

$g_d = g\left(1 - \frac{d}{R}\right)$

$g_h = g_d$

$\boxed{d = 2h}$

Q.21 $T = mr\omega^2$

$T \alpha r$

$\therefore \frac{T_2}{T_1} = \frac{r_2}{r_1} = T_2 = T_1 \times \frac{2r_1}{r_1}$

$= 1000\ N$

Q.22 $n \alpha \frac{1}{lr}$

$\therefore n_1 l_1 r_1 = n_2 r_2 l_2$

$n_1 l_1 r_1 = n_2 2r_1 \times 2l_1$

$\therefore n_1 = n_2$

$\therefore n_2 = \frac{n_1}{4}$

Q.23 $\frac{1}{2} Iw^2 \times \frac{75}{100} = Ms\Delta\theta$

$\frac{1}{5} \times \frac{2}{5} MR^2\omega^2 \times \frac{75}{100} = Ms\Delta\theta$

$\frac{R^2\omega^2}{4s} = \Delta\theta$

Q.24 $\frac{1}{2} mv^2 = \frac{3T}{\rho}\left(\frac{1}{a} - \frac{1}{b}\right)$

$\therefore v^2 = \frac{6T}{\rho}\left(\frac{1}{a} - \frac{1}{b}\right)$

$\therefore v = \sqrt{\frac{6T}{\rho}\left(\frac{1}{a} - \frac{1}{b}\right)}$

Q.25 Frequency independent to temperature.

Q.26 for diamagnetic material

$\mu_r + 1 = X$

$\mu_r = -$

and small

Q.27

$\frac{1}{\lambda_{Bal}} = R\left[\frac{1}{2^2} - \frac{1}{3^2}\right]$	$\frac{1}{\lambda_{Br}} = R\left[\frac{1}{4^2} - \frac{1}{5^2}\right]$
$= R\left[\frac{5}{36}\right]$	$= R\left[\frac{9}{400}\right]$
$\lambda_B = \frac{36}{5R}$	$\lambda_{Br} = \frac{400}{9R}$

$\therefore \frac{\lambda_B}{\lambda_{Br}} = \frac{36}{5R} \times \frac{9R}{400} = 0.162$

Q.28 Path diff $= (1.23 - 1.8) \times 10^{-5}$

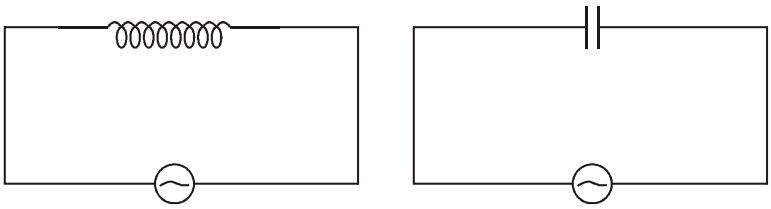
$= 0.57 \times 10^{-5}$

$$\frac{\text{Path diff.}}{\lambda} = \frac{0.57 \times 10^{-5}}{6 \times 10^{-7}} = 0.95 \times 10^{2}$$

$= 95\ \lambda$

$\because$ Path diff. is even multiple and $\frac{\lambda}{2}$

Pt is bright.

Q.29 

$$I = \frac{V}{X_L} \qquad I = \frac{V}{X_c}$$

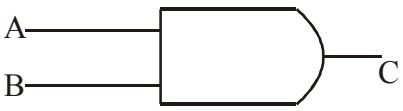
$$I \times \frac{1}{f} \qquad I \propto f$$

$I \downarrow f \uparrow$ $\qquad$ $I \uparrow f \uparrow$

Q.30 $2C - \frac{C}{2} = 6$

$\frac{3C}{2} = 6$

$C = 4mf$

Q.31 

(AND Gate)

$C = A \times B$

if any one input is low out put is low

Q.32 $F = qE$ & $F = qBV$ using KE

$\therefore \frac{1}{2}mv^2 = qBV$

$\therefore v = \sqrt{\frac{2Egl}{m}}$

Q.33 As the my is travelling win velocity $\frac{3}{4}$ time of light is air 't' s derivation must decrease

$\therefore$ deviatias is $\frac{3i}{4}$

Q.34 Due to conductor nearer to it by any surface shape is

$$E_1 = \frac{T}{\varepsilon_0}$$

while due to sheet

$$E_2 = \frac{T}{\varepsilon_0}$$

Thus $E_1 = E_2$

Q.35 $S = \frac{nBA}{k}$

$S \propto n$

Q.36 4^{th} transi is 5^{th} limit & 2^{nd} trans is tool.

$$\therefore E_5 = \frac{E_1}{25} \qquad E_3 = \frac{E_1}{9}$$

$$\therefore E_5 - E_3 = \frac{13.5}{25} - \frac{13.5}{9}$$

$$= 0.96$$

Q.37 $I \propto A^2$

$$\therefore \frac{A_1}{A_2} = \frac{2\sqrt{I}}{3\sqrt{E}}$$

$$\therefore \frac{I_{max}}{I_{min}} = \frac{(A_1 + A_2)^2}{(A_1 - A_2)^2}$$

$$= \frac{25I}{I}$$

Q.38 $\frac{X}{R} = \frac{l_X}{l_R}$

$$\frac{20}{30} = \frac{l_X}{l_R} .....(i)$$

$$\frac{10}{30} = \frac{l_X}{100 - l_X} ....(ii)$$

From (i) & (ii)

$l_X = 20\,cm$ from left.

Q.39 $50 > 40 > 30 > 20$

$\therefore$ for $P > Q > R > S$

$\therefore$ speed is mini. is S

Q.40 From a modulated signed we get carrier wave by demodulation

Q.41 decrease in length does not affect balancing deepth.

Q.42 $C' = 5\sin(10\pi t)$

$\therefore C' = 10\sin wt$

$\therefore wt = 10\pi$

$\therefore \quad X_L = WL$

$= 10\pi \times (2\times 10^{-2})$

$V = IR$

$= 5\times 10\pi \times 2\times 10^{-2}$

$= \pi$. volt

Q.43 $\beta_{dc} = \dfrac{\alpha dc}{1-\alpha dc}$

$= \dfrac{67/70}{1-69/10}$

$= 69$

Q.44 $I\alpha A^2$

$\therefore \quad \dfrac{(4+1)^2}{(4-1)^2} = \dfrac{25}{9}$

Q.45 $\dfrac{V}{2V} = \dfrac{I_g(G+50)}{I_g(G+500)}$

$\therefore \dfrac{1}{2} = \dfrac{G+50}{G+500}$

$\therefore = 400$

Q.46 $I_D = C\times \dfrac{dv}{dt}$

$= 2\times 10^{-6}\times 3$

$= 6\times 10^{-6}$

$= 6\mu F$

Q.47 $Q = CV$

$$\frac{V_2}{V_1} = \frac{C_2}{C_1} = 4:1$$

Q.48 $V_s = 124\omega\left[\frac{1}{\lambda} - \frac{1}{\lambda_0}\right]$

$$3V_0 = 124\omega\left[\frac{1}{\lambda} - \frac{1}{\lambda_0}\right] \times 1 ----(1)$$

$$V_0 = 124\omega\left[\frac{1}{2\lambda} - \frac{1}{\lambda_0}\right] \times 3 ----(2)$$

$$- \quad - \quad +$$

$$0 = \frac{1}{\lambda} - \frac{3}{2\lambda} + \frac{3}{\lambda_0} - \frac{1}{\lambda_0}$$

$$0 = -\frac{1}{2\lambda} + \frac{2}{\lambda_0}$$

$$\lambda_0 = 4\lambda$$

Q.49 $M = NIA$

$$M \propto r^2 N$$

$$N \propto \frac{1}{r}$$

$$M \propto r$$

$$M' = M/4$$

Q.50 $\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2mE_k}}$

CHEMISTRY

Q.51 Arene diazonium cation $\left(Ar\overset{+}{N}_2 \right)$ is stable due to resonance which is not possible with alkyl diazonium salts; hence they are unstable.

Q.52 Helium is exceptional element with electronic configuration of $1s^2$. Since it is an inert gas, it is monotonic

Q.53 According to IUPAC Rules

Q.54 According to general solution equation ;

$$\pi V = nRT$$

$$\Rightarrow \pi V = \frac{W}{M}RT$$

$$\Rightarrow \pi = \frac{TWR}{VM}$$

Q.55 Balz-Schiemann reaction

Q.56. $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)$ since gaseous reactants convert to liquid product, disorder decreases and hence entropy decrease i.e. $\Delta S < 0$.

Q.57 Given complexes differ only in distribution of ligands between the co-ordination sphere.

Q.58 Rate $= [O_3]^1 [O]^1$. Hence order to reaction = 1+ 1 = 2

Molecularity is also 2.

Q.59 Stephen reaction

Q.60 Due to presence of large number of unpaired electron

Q.61. $\underset{\text{Sucrose}}{C_{12}H_{22}O_{11}} + H_2O \rightarrow \underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Fructose}}{C_6H_{12}O_6}$

1 mole of Sucrose ≡ 342 g of sucrose

1 mole of water ≡ 18 g of H_2O

Now, 342 g is 0.342 kg of sucrose requires 18 g of H_2O for hydrolysis

$\therefore$ 1.368 kg of sucrose requires.....?

$$\Rightarrow \text{weight of } H_2O \text{ read} = \frac{1.368 \times 18}{0.342} g = 72g$$

$\therefore$ Density of H_2O = 1g / cm^3 , $\therefore$ volume of water = 72 cm^3 = 0.072 dm^3

Q.62 Pssivation $\rightarrow$ outermost layer is made passive so that inner layers get protected from corrosion.

Q.63 Due to presence of vacant 'd' orbitals

Q.64 $-C \equiv N$ takes higher prioity than Phenyl $\left[C_6H_5^- \right]$ because nitrogen has higher atomic number than carbon.

Q.65 $C_2H_6(g)+\frac{7}{2}O_2(g)\rightarrow 2CO_2(g)+3H_2O(l)$

$$\Delta n = 2-\left[1+\frac{7}{2}\right]=\frac{-5}{2}$$

$$W=-p\Delta V=-\Delta nRT=-\left\{\frac{-5}{2}\times 8.314\times 300\right\}\text{J}$$

$$=+2.5\times 8.31\times 0.3\,KJ$$

This is work done for combustion of 1 mole of C_2H_6 i.e 30 g of C_2H_6
or 0.03 kg of C_2H_6 will be :
Hence work done during combustion of 0.09 kg of C_2H_6 will be

$$W=2.5\times 8.314\times 0.3\times 3KJ$$

$$=2.5\times 8.314\times 0.9\,KJ$$

$$=2.5\times 8.314\times 0.9KJ$$

$$=18.7\,KJ$$

Q.66 Potassium dichromate is a good oxidising agent in acidic medium. In this process potessium dichromate (Oxidation number of Cr = 6) is reduced to chromium sulphate (Oxidation Number of Cr = + 3)

$$Cr_2O_7^{2-}+14H^++6e^-\rightarrow 2Cr^{+3}+7H_2O$$

Dichromate ion gains 6 electrons and hence acts as an oxidising agent.

Q.67 $(C_2H_5)_2N\text{-}[H+HO]\text{-}N=O \xrightarrow{0^0C}$

$(C_2H_5)_2N-N=O+H_2O$

Q.68 Oxygen $\rightarrow$ 46.6%

Q.69 At anode , oxidation of chloride ions takes place, librating chlorine gas

$$2Cl^-(aq)-2e^-\rightarrow Cl_2(g)\uparrow$$

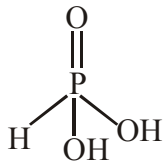
Q.70 Promethium does not exist in earth crust because it is radioactive with small life time.

Q.71 Tellurium

Q.72 $CaCO_3$

Q.73 Polythene, Nylon - 6 & Teflon are prepared from only one monomer and hence are called Homopolymers. nylon -6 , 6 is a condensation polymer prepared from 2 monomers and hence is heteropolymer.

Q.74



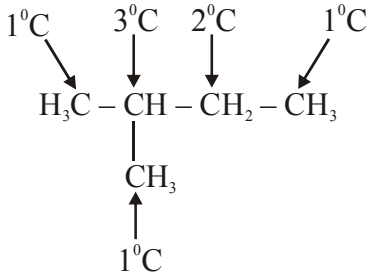
P–H bond does not ionize. Only O–H bond ionizes and hence basicity of acid is 2.

Q.75 Aldehydes are more reactive than ketones due to both electronic and stearic reasons. Formaldehyde is the most reactive carbonyl compound since there are no alkyl groups attached to carbon.

Q.76 In adiabatic expansion, work is done by using internal energy of gas or system ; hence $\Delta U < 0$

Q.77 According to definition

Q.78 Hydrocarbon is Isopentane



Since there are 4 types of Hydrogen atoms which can be replaced by hydroxy group, hence there can be 4 Monohydroxy derviatives of this hydrocarbon

Q.79 $V_1 = 1m^3 = 1000\,dm^3$

$V_2 = 10\,dm^3$

$\therefore \Delta V = V_2 - V_1 = 10dm^3 - 1000\,dm^3$

$= -990\,dm^3$

Work done $= -P_{ext}.\Delta V$

$= -100\,KPa \times (-990)\,dm^3$

$= 100 \times 990J$

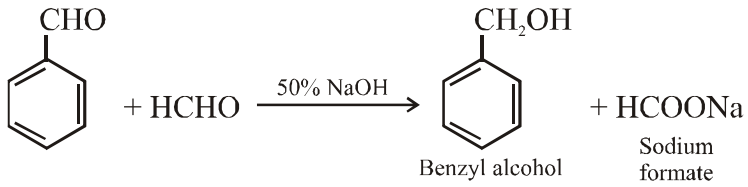
$= \frac{100 \times 990}{1000} KJ$

$= 99KJ$

Q.80 Manganian is used in making of resistors and ammeter shunts

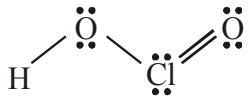
Q.81 Albumin

Q.82 Sodium formate and benzyl alcohol.



Q.83 Saturated KCl

Q.84 Chlorine



Q.85 Copper

Q.86 Valium

Q.87 Ultraviolet light

Q.88 $Nb-Ta$

Q.89 $t_{\frac{1}{2}} = \frac{[A]_0}{2k}$

Q.90 Bakelite

Q.91 $K_3\left[Fe(CN)_6\right] \rightarrow 3K^+ + \left[Fe(CN)_6\right]^{3-}$

$\therefore n' = 4$

$$\alpha = \frac{i-1}{n'-1} = \frac{3.333-1}{4-1} = \frac{2.333}{3}$$

$= 0.778 \approx 0.78$

$\therefore \%\alpha = 78$

Q.92 2-Chlorobutanoic acid

Conjugate base of 2-chlorobutanoic acid is more stable than conjugate base at 4-chlorobutanoic acid, 3-chlorobutanoic acid and butanoic acid due to – I effect of chlorine.

Q.93 Leaching

By Bayer's process

Q.94 Propan-1-ol

Due to more dipole moment (Hydrogen bonding)

Q.95 Aluminimum

Because FCC has maximum packing efficiency about 74%

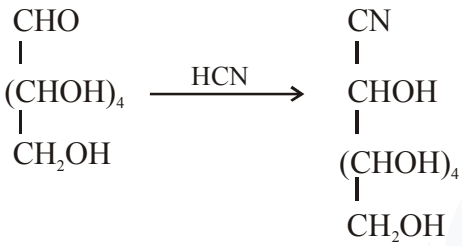
Q.96 Hydrosulphurous acid

Q.97 Pentaerythrityl stearate

Q.98 tert-butyl methyl ether

$$(CH_3)_3C-O-CH_3 + HI \xrightarrow{cold} (H_3C)_3C-I + CH_3OH$$

Q.99 Aldehydic group



Q.100 $t_{1/2} = 6.93\ hr$

$k = ?$

$$t_{1/2} = \frac{0.693}{k}$$

$$\therefore\ k = \frac{0.693}{6.93} = \frac{0.693}{0.693 \times 10^{1}} = 10^{-1}$$

$$\boxed{k = 0.1h^{-1}}$$

BIOLOGY

Q.101 In the first step of Monohybrid cross experiment, Mendel selected pea plants which were pure tall as female and pure dwarf as male. Govt.

Q.102 In Grifiith's experiment, the conversion of R-type to S-type of *Diplococcus Pneumonia* when mixed with heat killed S-type is called transformation.

Sudden change in genetic material is called mutation.

Insertion of vector into the eukaryotic cell is called transfection and insertion of a viral vector is called transduction.

Q.103 Semidwarf rice variety IR-8 was developed at International Rice Research Institute (IRRI), Philippines.

Q.104 Castor, sunflower and coconut are endospermic or albuminous seeds whereas ground nut is non-endospermic or non-albuminous seed.

Q.105 *Xanthomonas sp.* is an example of bacterial pathogen as herbicide.

Q.106 During anaerobic respiration, conversion of pyruvate into acetaldehyde takes place in presence of enzyme pyruvate decarboxylase. Coenzyme thymine pyrophosphate (TPP) and cofactor Zn^{++} is necessary for this reaction.

$$2CH_3 - CO - COOH \xrightarrow[TPP + Zn^{++}]{\text{Pyruvate decarboxylase}} 2CH_3 - CHO + 2CO_2$$

Q.107 An international treaty, known as Montreal Protocol was signed at Montreal (Canada) in 1987 to control the emission on ozone depleting substance, mainly CFCs.

Q.108 In higher plants, lens shaped chloroplasts are present.

Q.109 Microsporangium contain a compact mass of diploid sporogenous tissue. The cells of this tissue may undergo mitosis or directly function as microspore mother cell. Microspore mother cell undergo meiosis to form four haploid pollengrains or microspores.

Q.110 The removal of introns from the RNA is called spilicing. Addition of methyl guanosine triphosphate at $5'$ end is called capping. Addition of adenylate residues at $3'$ end is called tailing.

Q.111 It is an example of polygeneic inheritance where two genes control the particular character, so ratio in F_2 generation will be 1:4:6:4:1

Q.112 During development of embryo, the zygote forms a wall around it and is converted into oospore. The oospore divides transversly to form large suspensor cell and small embryonal cell.

Q.113 In PS-II, in addition to electron carriers, manganese, calcium and chloride ions are present which play imporant role in photolysis of water.

Q.114 The given equation represents complete glycosis.

Q.115 M13 is a bacteriophage having single stranded circular DNA as a genetic material.

Q.116 Detritus food chain starts from dead organic matter. Detritivores like earthworm carry out the process of fragmentation.

Q.117 For organogensis, growth hormones like Auxins and Cytokinins are required.

Q.118 *Salvia* is an entomophilous plant.

Q.119 The macroconsumers are herbivores and carnivores. Herbivores are primary consumers.

Q.120 The visible portion of light spectrum useful in photosythesis is called as Photosynthetically Active Radiation (PAR). It ranges from 390 nm to 760 nm.

Q.121 *Pseudomonas denitrificans* produces vitamin B 12.

Q.122 1280 micropores are in 4 chambers of anther.

So, each pollen chamber has 320 pollens.

One microspore mother cell = 4 pollens

80 microspore mother cells = 320 pollens.

Each pollen chamber has 80 microspore mother cells.

Q.123 *Oxalis* propagates by runner.

Q.124 Option (A) gives the correct pairs.

Q.125 Human skin colour is an example of Quantitative inheritance (polygenic Inheritance).

Q.126 The lagging strand is constructed discontinuously in the form of short fragments of DNA in $5' \rightarrow 3'$ direction.

Q.127 Micropropagation is the technique of producing large number of genetically similar plants within short time by tissue culture.

Q.128 Out of 64 codons, 3 codons are termination codons or stop codons. Therefore, there are 61 codons for 20 amino acids.

Q.129 Grafting is an artificial method of vegetative propagation.

Q.130 Transposons are sequences of DNA that can move or transpose themselves to new position within the genome of a single cell.

Q.131 340 A° long segment of DNA has 100 base pair.

100 base pairs = 200 nitrogen bases

Out of 200, T = 20; A = T, Adenine = 20

A + T = 40; so C + G = 200 – 40

C + G = 160

$C \equiv G$ so, Guanine = 80 and Cytosine = 80.

Q.132 In ETS, final electron acceptor is oxygen which combines with $2H^+$ to produce metabolic water.

Q.133 The time taken from the fixation of CO_2 to the formation of one molecule of glucose is about 90 seconds.

Q.134 Vincristin and Vinblastin are secondary metabolic product obtained from *Catharanthus roseus*.

Q.135 Pollination which takes place by bats is called Chiropterophily.

Q.136 During biogas production, acetic acid is transformed to biogas by methanogenic bacteria such as *Methanococcus* and *Methanobacillus*.

Q.137 In gymnosperms, multicellular, haploid female gametophyte nourishes the developing embryo and is called endosperm.

Q.138 Emasculation is done in the flowers of plants selected as female parent.

Q.139 Pusa Shubhra is a variety of cauliflower resistant to curl blight black rot and black rot diseases.

Q.140 Thymine, Uracil and Cytosine are Pyrimidine bases.

Q.141 In nomenclature of enzyme restriction endonuclease the Roman numeral indicates the order of discovery.

Q.142 Air, water and wind are abiotic agents helping in pollination.

Q.143 Individual having genotype AaBbcc will produce 4 different types of gametes as there are two contrasting characters.

Q.144 Geitonogamy is the transfer of pollen grains from anther to the stigma of another flower produced on same plant. Example. Cucurbits.

Q.145 Initial step in preparation of beer is malting followed by mashing and fermentation.

Q.146 Recombinant DNA (rDNA) technology is the technique of manipulating genome of a cell or organism so as to change the phenotype desirably.

Q.147 Yeast $\rightarrow$ Budding

Penicillium $\rightarrow$ Conidia

Filamentous algae $\rightarrow$ Fragmentation

Chlamydomonas $\rightarrow$ Zoospores

Q.148 Approximately, 40% of the released energy is conserved as chemical energy in the form of ATP during respiration.

Q.149 The spiral ladder like arrangement of DNA molecule is due to deflection angle of 36° between two succesive steps.

Q.150 Maize, Sugarcane and Jowar are C_4 plants.

Q.151 Cells of leydig secretes a hormone testosterone after puberty.

Q.152 Nephritis is an incomplete X linked gene, whereas other options are of completely sex linked genes.

Q.153 The first fossil of Australopithecus was discovered in Taung in south africa.

Q.154 Heroin is depressant.

Q.155 Serotonin & Melatonin are secreted by Pineal body.

Q.156 The given characters are observed in Fossorial adaptation.

Q.157 Deposition of Uric acid in the joints causes gout.

Q.158 The glycoprotein, fertilizine is secreted by ovum after ovulation

Q.159 In the diagram I-Telomeres; II- Satellite

Q.160 Mackeral is marine water fish ; Mirgala is cirrhina.

Q.161 International Union for Conservation of Nature and Natural Resources (IUCN) maintains Red list of endangered species.

Q.162 HGP was initiated in 1990.

Q.163 Ectoderm gives rise to enamel of teeth, nails, adrenal medulla and hair.

Q.164 Killer T cells secretes Perforins.

Q.165 Epicanthal skin fold and simian crease are charcteristics of Down's syndrome.

Q.166 Nagpuri is the breed of buffaloo.

Q.167 More than 95% of transgenic animals are mice.

Q.168 Mons pubis is not homologous to glans penis.

Q.169 Transport of RBCs is not the function of lymph.

Q.170 It is an example of brood parasitism.

Q.171 Dinosaurs were dominant in Jurassic period.

Q.172 Part I- Scala vestibuli; II- Scala media; III- Scala tympani.

Q.173 Transgenic animals are generally produced for vaccine safety, chemical safety testing and as bioreactors to produce pharmacologically important proteins.

Q.174 Mercury causes- Abdominal pain, haemolysis; Lead causes- Anaemia, convulsions
Arsenic causes- Hyperkeratosis, Liver cirrhosis; Cadmium- Bone deformation, testicular atropy.

Q.175 I- Trophoblast; II- Blastocoel; III- Inner cell mass.

Q.176 Snake is reptile which is uricotelic.

Q.177 The study of blood vessels is called as angiology.

Q.178 Plasma cells are derived from b-lymphocytes.

Q.179 Darwin's theory of evolution cannot explain arrival of fittest.

Q.180 During ovulation, the ovary releases secondary oocyte.

Q.181 JG cells of kidney secrete hormone Renin.

Q.182 Stromateus (Pomphret) is marine fish.

Q.183 *Drosophila melanogaster* was selected by Morgan for studying linkage.

Q.184 The increase in blood flow to heart stimulates secretion of Atrial natriuretic factor (ANF).

Q.185 Heaviness with severe chest pain which may disappear with rest indicates Angina pectoris.

Q.186 The co-ordinator between Nervous and endocrine system is Hypothalamus.

Q.187 Malaria- Plasmodium falciparum; Filariasis- Wuchereria bancrofti

Q.188 Tissue Plasminogen Activator (TPA) used to prevent or reverse blood clots.

Q.189 Gibbon- Hyalobatidae
New world monkey- Ceboidea
Tarsier- Prosimii

Q.190 ANF decreases blood volume & blood pressure.

Q.191 Morula is 16 celled stage.

Q.192 Coonecting link- Archeopteryx; Genetic drift- Sewall-wright effect; Industrial Melanism- Peppered moth.

Q.193 There are 22 pairs of sympathetic gangila present in ANS.

Q.194 The first vaccine produced by Jenner was for protection against small pox.

Q.195 I- Monocyte & V- Neutrophil are phagocytic in nature.

Q.196 Forceful muscular contractions of uterine wall is involved in Parturition.

Q.197 Mg^{++} is not a second messenger in hormone action.

Q.198 Golden Jackel - Tiger is an example of commensalism; where as Plasmodium-anopheles is an example of hyperparasitism; Ascaris - Man is an example of parasitism; Sacculina-crabis an example of mutualism.

Q.199 Expulsion of placenta, umbilical cord and foetal membrane is referred as After birth.

Q.200 Occulomotor, Abducens and Trochlear innervates extra ocular muscles and controls the movement of eyeball.