Telangana State Power Generation Corporation Limited

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Chemist 14th Jul 2024 Shift 1
Subject Name :	Chemist
Creation Date :	2024-07-14 12:48:20
Duration :	100
Total Marks :	100
Display Marks:	Yes
Change Font Color :	No
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Change Theme :	No
Help Button :	No
Show Reports :	No
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Chemist

Group Number :	1
Group Id :	1705273
Group Maximum Duration :	0
Group Minimum Duration :	100
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	100

Section A

Section Id :	1705275
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	80

Number of Questions to be attempted :	80
Section Marks :	80
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	1705275
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 170527201 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Arrange the following molecules in the increasing order of number of lone pairs of electrons on their respective central atoms

I BeF_2
II XeF_2
III SCl_2
IV $SnCl_2$

The correct option is

Options :

1. ✖ $I < IV < II < III$

2. ✖ $I < III < IV < II$

3. ✔ $I < IV < III < II$

4. ✖ $IV < I < III < II$

Question Number : 2 Question Id : 170527202 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Identify the correct orders with respect to the stability of complexes.

(i) $\left[AgF_2\right]^- > \left[AgI_2\right]^-$

(ii) $[CoF_6]^{3-} > [CoI_6]^{3-}$

(iii) $LiF > LiI$

(iv) $HgF_2 > HgI_2$

The correct option is

Options :

1. ✖ i, ii only

2. ✔ ii, iii only

3. ✖ i, iii only

4. ✖ ii, iv only

Question Number : 3 Question Id : 170527203 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Observe the following molecules

SO_2, $PbCl_2$, ClF_3, SF_4, XeF_4, XeO_2F_2, BrF_5, PCl_5

The number of molecules having sp^3d hybridization on central atom is

Options :

1. ✖ 2

2. ✖ 5

3. ✖ 3

4. ✔ 4

Question Number : 4 Question Id : 170527204 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Match the following

List -I		List -II	
A	Sodium carbonate	I	Petrochemical industry
B	Zeolites	II	Detergent industry
C	Dinitrogen	III	Textile industry
D	Sulphuric acid	IV	Steel industry

The correct option is

Options :

1. ✖ A – III, B – IV, C – I, D – II

2. ✖ A –IV, B –III, C – II, D – I

3. ✔ A –III, B – I, C – IV, D – II

4. ✖ A –I, B – III, C – II, D – IV

Question Number : 5 Question Id : 170527205 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The allotrope of phosphorus having chemiluminescence property is

Options :

1. ✔ White phosphorus

2. ✖ Red phosphorus

3. ✖ α-black phosphorus

4. ✖ β-black phosphorus

Question Number : 6 Question Id : 170527206 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

For which pair(s) of complex ions, the order of values of Δ_o is correct?

(i) $[Co(H_2O)_6]^{3+} > [Co(H_2O)_6]^{2+}$

(ii) $[Rh(NH_3)_6]^{3+} > [Co(NH_3)_6]^{3+}$

(iii) $[CoF_6]^{3-} > [Co(NH_3)_6]^{3+}$

The correct option is

Options :

1. ✖ (i), (iii) only

2. ✖ (ii), (iii) only

3. ✖ (i), (ii), (iii)

4. ✔ (i), (ii) only

Question Number : 7 Question Id : 170527207 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Three absorption bands at 17000 cm^{-1}, 24000 cm^{-1} and 37000 cm^{-1} are seen in the electronic spectrum of $[Cr(H_2O)_6]^{3+}$. The absorption band at 37000 cm^{-1} corresponds to

Options :

1. ✖ $^4A_{1g} \rightarrow {}^4T_{2g}$

2. ✔ $^4A_{1g} \rightarrow {}^4T_{1g(P)}$

3. ✖ $^4A_{1g} \rightarrow {}^4T_{1g(F)}$

4. ✖ $^4T_{1g(F)} \rightarrow {}^4T_{1g(P)}$

Question Number : 8 Question Id : 170527208 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The number of electron pairs in the multicentre bonding orbitals of skeletal structure of arachno $C_2B_7H_{13}$ is

Options :

1. ✖ 7

2. ✖ 9

3. ✔ 12

4. ✖ 5

Question Number : 9 Question Id : 170527209 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The μ_{eff} value (in BM) of Ce^{3+} is

Options :

1. ✔ 2.54

2. ✖ 1.73

3. ✖ 2.82

4. ✖ Zero

Question Number : 10 Question Id : 170527210 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Observe the following reaction

$$trans-Pt(Py)_2Cl_2 + Y \rightarrow trans-Pt(Py)_2ClY + Cl^-$$

for this reaction, the rate constant is more when Y is

Options :

1. ✔ PPh_3

2. ✖ NH_3

3. ✖ SCN^-

4. ✖ N_3^-

Question Number : 11 Question Id : 170527211 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

In the following reaction,

$$H_2C=CH_2+\frac{1}{2}O_2 \xrightarrow{X} CH_3CHO$$

the catalyst 'X' is

Options :

1. ✖ $RhCl(PPh_3)_3$

2. ✖ $TiCl_4 \mid AlEt_3$

3. ✖ $LiBu^n$

4. ✔ $PdCl_2 \mid CuCl_2$

Question Number : 12 Question Id : 170527212 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The total electron count and geometry of Os_6 core in $[Os_6(CO)_{18}P]^-$ respectively are

Options :

1. ✖ 90, octahedron

2. ✔ 90, trigonal prismatic

3. ✖ 86, octahedron

4. ✖ 86, trigonal prismatic

Question Number : 13 Question Id : 170527213 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The ^{1}H NMR spectrum of $[Ru(\eta_4 - C_8H_8)(CO)_3]$ at 23°C consists of a sharp single line. The number of signals observed at $-140°C$ in its spectrum is

Options :

1. ✖ 8

2. ✖ 6

3. ✔ 4

4. ✖ 2

Question Number : 14 Question Id : 170527214 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The number of Raman active vibrations for CO_2 molecule is

Options :

1. ✔ One

2. ✖ Two

3. ✖ Three

4. ✖ Four

Question Number : 15 Question Id : 170527215 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The correct order of isomeric shift of Fe(II), Fe(III), Fe(IV) compounds in their Mossbauer spectra is

Options :

1. ✖ Fe(III)> Fe(II)> Fe(IV)

2. ✖ Fe(IV)> Fe(III) > Fe(II)

3. ✖ Fe(IV)> Fe(II) > Fe(III)

4. ✔ Fe(II)> Fe(III) > Fe(IV)

Question Number : 16 Question Id : 170527216 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

In the sequence of the following reactions

$$^{238}_{98}X \xrightarrow{-\alpha} Y \xrightarrow{-\beta} Z \xrightarrow{-\beta} L \xrightarrow{-n\alpha} {}^{218}_{90}M$$

What is the value of n?

Options :

1. ✔ 4

2. ✖ 3

3. ✖ 5

4. ✖ 2

Question Number : 17 Question Id : 170527217 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The protein content in (i) 20 types of hybrid wheat varieties and (ii) 30 types of local wheat varieties, were estimated. The variance in (i) is 15.0 while the variance in (ii) is 3.0. What is F ratio?

Options :

1. ✖ 0.2

2. ✔ 5

3. ✖ 3.33

4. ✖ 0.3

Question Number : 18 Question Id : 170527218 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The weight of precipitate is 500 mg. When it was washed with 200 mL of wash liquid, 0.5mg of precipitate is lost. What is the relative error in this experiment?

Options :

1. ✖ -1%

2. ✔ -0.1%

3. ✖ +1%

4. ✖ −0.01%

Question Number : 19 Question Id : 170527219 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

An office table of 3m width was measured using 1m metal rule (scale). The following errors were noticed

(a) The meter metal rule is shorter by 0.1mm

(b) The markings were read at a given angle

(c) Variability in the placement of metal rule to measure full 3m width

The number of systematic errors in the above list is

Options :

1. ✖ zero

2. ✖ 3

3. ✖ 1

4. ✔ 2

Question Number : 20 Question Id : 170527220 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

A student was asked to perform the following reaction

$R-CH=CH-R'+KCN \rightarrow$ products

Which one of the following is the safest method of doing the reaction?

Options :

1. ✖ Doing the reaction in open space without hand gloves, eye protection and lab coat

2. ✖ Doing the reaction in fuming cupboard without hand gloves and lab coat but with eye protection.

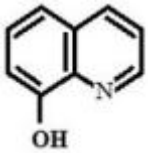
3. ✔ Doing the reaction in fuming cupboard with hand gloves, eye protection, lab coat and under the supervision of teacher

4. ✖ Doing the reaction under the supervision of teacher but without wearing hand gloves, eye protection and lab coat

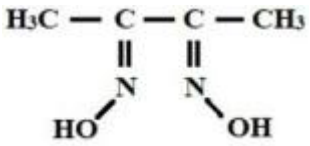
Question Number : 21 Question Id : 170527221 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

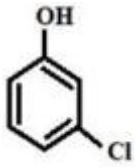
Identify the organic reagent used for gravimetric analysis of Ni^{2+} in weakly alkaline solution

Options :

1. ✖ 

2. ✖ $(C_6H_5)_4B^-Na^+$

3. ✔ 

4. ✖ 

Question Number : 22 Question Id : 170527222 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

A solution of Cr^{3+} was passed through a burette containing Zn(Hg) (s) under mild vaccum. The solution coming out of burette contains Cr^{2+} ions only. This is an example of

Options :

1. ✔ Jones reductor

2. ✖ Photo reductor

3. ✖ Walden reductor

4. ✖ Gas reductor

Question Number : 23 Question Id : 170527223 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Observe the following list of primary standard compounds and the chemical to be standardised

	Primary standard compounds	Chemical to be standardized
(i)	Na_2CO_3	HCl
(ii)	NaCl	$AgNO_3$
(iii)	$K_2Cr_2O_7$	Ferrous ammonium sulphate
(iv)	Potassium hydrogen phthalate (in glacial acetic acid)	Perchloric acid

How many of the above pairs are correctly matched

Options :

1. ✔ 4

2. ✖ 3

3. ✖ 2

4. ✖ 1

Question Number : 24 Question Id : 170527224 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which one of the following reactions belongs to complexometric titration?

Options :

1. ✖ $AgNO_3 + (NH_4)SNC \rightarrow$ Products

2. ✖ $HCl + Na_2CO_3 \rightarrow$ Products

3. ✖ $KMnO_4 + H_2SO_4 + H_2C_2O_4 \rightarrow$ Products

4. ✔ $Hg^{2+} + SCN^- \rightarrow$ Products

Question Number : 25 Question Id : 170527225 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Metal ion (M^{n+}) forms octahedral complexes only. It forms a 1:1 complex with EDTA(H_4Y) of formula $[MY]^-$. In this complex EDTA is

Options :

1. ✖ a monodentate ligand

2. ✖ a bidentate ligand

3. ✖ a tetradentate ligand

4. ✔ a hexadentate ligand

Question Number : 26 Question Id : 170527226 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

EDTA is represented as H_4Y. What is the molar Y^{4-} concentration in a 0.02M EDTA solution which is buffered at pH = 10?
(At pH = 10, the $\alpha_4 = 0.35$)

Options :

1. ✖ 0.02M

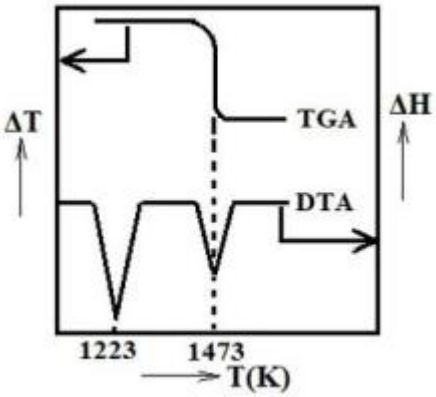
2. ✔ 0.007M

3. ✖ $\frac{0.02}{0.35}$M

4. ✖ $\frac{0.35}{0.02}$M

Question Number : 27 Question Id : 170527227 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The DTA and TGA of $SrCO_3$ is shown below



The peak at 1223K in DTA profile corresponds to

Options :

1. ✖ loss of CO from $SrCO_3$

2. ✖ loss of CO_2 from $SrCO_3$

3. ✔ phase transformation of $SrCO_3$ (rhombic) to $SrCO_3$ (hexagonal)

4. ✖ formation of elemental Sr

Question Number : 28 Question Id : 170527228 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The TGA profile of freshly precipitated Ag_2CrO_4 shows the formation of Ag and $Ag_2Cr_2O_4$ in the temperature range of 812 – 945°C. What is the weight loss?
(At. wts: Ag = 108; Cr = 52; O = 16 u)

Options :

1. ✔ 9.63%

2. ✖ 4.81%

3. ✖ 19.26%

4. ✖ 2.42%

Question Number : 29 Question Id : 170527229 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Identify the correct statements from the following

(i) Refractive index (RI) detector is used in HPLC for the determination $\overline{M}_w$ and $\overline{M}_n$ of straight chain polymer

(ii) The composition of mobile phase remains same in gradient elution

(iii) TCD is used for estimating H_2 gas in GLC

Options :

1. ✖ (i), (ii), (iii)

2. ✔ (i), (iii) only

3. ✖ (i), (ii) only

4. ✖ (ii), (iii) only

Question Number : 30 Question Id : 170527230 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following techniques can be employed to separate rare earth ions?

Options :

1. ✖ Paper chromatography

2. ✖ Thin layer chromatography

3. ✖ Gas liquid chromatography

4. ✔ Ion-exchange chromatography

Question Number : 31 Question Id : 170527231 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

If t_M and t_R are retention times of mobile phase and compound respectively, then capacity factor (k') is equal to

Options :

1. ✖ $k' = (t_R - t_M)$

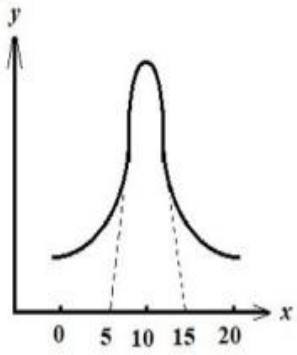
2. ✖ $k' = (t_R - t_M)^2$

3. ✔ $k' = \frac{t_R - t_M}{t_M}$

4. ✖ $k' = \frac{(t_R - t_M)^2}{t_M}$

Question Number : 32 Question Id : 170527232 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The efficiency of a column is expressed as "number of theoretical plates (N)". In an experiment, an organic compound was eluted as shown below
(x = elution volume in mL; y= concentration)



What is N?

Options :

1. ✔ 16

2. ✖ 8

3. ✖ 32

4. ✖ 64

Question Number : 33 Question Id : 170527233 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Find $\left[\frac{d}{dx}, \hat{x}\right]$

$\hat{x}$ = multiplication by x

Options :

1. ✖ Zero

2. ✔ +1

3. ✖ −1

4. ✖ Infinity

Question Number : 34 Question Id : 170527234 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

A particle of mass 10^{-30} kg is present in a cubical box of edge length of 1m. What is the energy in J required to excite this particle from ground state to next immediate excited state?

$(h = 6.6\times10^{-34}\ Js)$

Options :

1. ✖ 32.66×10^{-38}

2. ✖ 49×10^{-68}

3. ✔ 16.33×10^{-38}

4. ✖ 16.33×10^{-68}

Question Number : 35 Question Id : 170527235 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

What is the orbital angular momentum $\left(|\vec{L}|\right)$ of an electron present in 2p orbital?

$(\hbar = 1.05\times10^{-34} Js)$

Options :

1. ✖ 5.94×10^{-34} Js

2. ✖ 3×10^{-38} Js

3. ✖ 1.49×10^{-38} Js

4. ✔ 1.49×10^{-34} Js

Question Number : 36 Question Id : 170527236 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

What are the ground state term symbols of H and Li atoms respectively

Options :

1. ✔ $^2S_{\frac{1}{2}}, {}^2S_{\frac{1}{2}}$

2. ✖ $^2S_{\frac{1}{2}}, {}^2P_{\frac{1}{2}}$

3. ✖ $^2P_{\frac{1}{2}}, ^2S_{\frac{1}{2}}$

4. ✖ $^2P_{\frac{1}{2}}, ^2P_{\frac{1}{2}}$

Question Number : 37 Question Id : 170527237 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The wave function of a multi electron atom is

$\psi^{(o)} = \psi_{orb}\psi_{spin}$

The ground state wave function of He atom is

$\psi^{(o)} = (1s(1)1s(2)).\frac{1}{\sqrt{2}}[\alpha(1)\beta(2) - \beta(1)\alpha(2)]$

(The spin of electron is either α or β. Electrons are numbered as 1 and 2).

Identify the correct statement from the following

Options :

1. ✔ ψ_{orb} is symmetric and ψ_{spin} is antisymmetric

2. ✖ ψ_{orb} is antisymmetric and ψ_{spin} is symmetric

3. ✖ ψ_{orb} is symmetric and ψ_{spin} is symmetric

4. ✖ ψ_{orb} is antisymmetric and ψ_{spin} is antisymmetric

Question Number : 38 Question Id : 170527238 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The rotational constant (B) of a diatomic molecule is $2\ cm^{-1}$. What is the energy (in cm^{-1}) required for $J = 6$ to $J = 7$ transition?

Options :

1. ✖ 112

2. ✖ 84

3. ✔ 28

4. ✖ 56

Question Number : 39 Question Id : 170527239 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which one of the following is the correct Maxwell relationship?

Options :

1. ✖ $\left(\frac{dT}{dV}\right)_S = \left(\frac{dP}{dS}\right)_T$

2. ✔ $\left(\frac{dT}{dV}\right)_S = -\left(\frac{dP}{dS}\right)_V$

3. ✖ $\left(\frac{dT}{dV}\right)_S = -\left(\frac{dP}{dS}\right)_T$

4. ✖ $\left(\frac{dV}{dT}\right)_S = \left(\frac{dP}{dS}\right)_T$

Question Number : 40 Question Id : 170527240 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

For a two-component system, the phase rule equation is

Options :

1. ✖ $F = 3 - P$

2. ✖ $F = 4 + P$

3. ✖ $F = 3 + P$

4. ✔ $F = 4 - P$

Question Number : 41 Question Id : 170527241 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Aqueous solution of KCl obeys Debye-Huckel theory of strong electrolytes. For KCl, a plot of molar conductance versus square root of KCl concentration gave a straight line with intercept of 150×10^{-4} and slope of 60.203. What is $\wedge^{\circ}_{m}$ (in Sm^2mol^{-1}) of KCl?

Options :

1. ✔ 150×10^{-4}

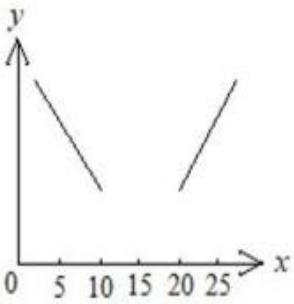
2. ✖ 60.203

3. ✖ $\frac{150\times10^{-4}}{60.203}$

4. ✖ $\frac{60.203}{150\times10^{-4}}$

Question Number : 42 Question Id : 170527242 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

A student obtained the following graph for conductometric titration of HCl with NaOH. (x = Volume of NaOH added in mL; y = Conductance)



The volume (in mL) of NaOH at the end point is:

Options :

1. ✖ 5

2. ✖ 10

3. ✔ 15

4. ✖ 20

Question Number : 43 Question Id : 170527243 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

At 30°C, for a first order reaction $(A \rightarrow \text{Products})$, the concentration of A at $t = 0$ is 2.5×10^{-2} mol L^{-1}. After 2 min, its concentration is 1.5×10^{-2} mol L^{-1}. What is the value of $-\frac{d[A]}{dt}$?

Options :

1. ✖ 10^{-2} mol L^{-1} min^{-1}

2. ✖ 5×10^{-3} mol L^{-1}

3. ✖ 5×10^{-2} mol L^{-1} min^{-1}

4. ✔ 5×10^{-3} mol L^{-1} min^{-1}

Question Number : 44 Question Id : 170527244 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The influence of salt effect on the reaction, $S_2O_3^{2-} + I^- \rightarrow$ Products, is studied. A plot of $\ln\left(\frac{k}{k_0}\right)$ versus $\sqrt{I}$ gave a straight line with slope of 'm'. what is the value of 'm' (I = ionic strength)

Options :

1. ✖ 1.02

2. ✔ 2.04

3. ✖ 4.08

4. ✖ 6.12

Question Number : 45 Question Id : 170527245 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The edge length of a cubic crystal is 5.656 Å. What is the interplanar distance (d_{hkl}) in Å for (220) plane?

Options :

1. ✔ 2

2. ✖ 2.828

3. ✖ 3.15

4. ✖ 1.2

Question Number : 46 Question Id : 170527246 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Compared to true solution, the colloidal solution exhibits

Options :

1. ✖ higher osmotic pressure, higher elevation in boiling point

2. ✔ lower osmotic pressure, lower elevation in boiling point

3. ✖ higher osmotic pressure, lower elevation in boiling point

4. ✖ lower osmotic pressure, higher elevation in boiling point

Question Number : 47 Question Id : 170527247 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

A polymer sample contains 10 molecules of molecular weight 1000 g mol^{-1}, 40 molecules of molecular weight 5000 g mol^{-1} and 50 molecules of molecular weight 10000 g mol^{-1}.

What is the number average molecular weight (in g mol^{-1}) of polymer?

Options :

1. ✔ 7100

2. ✖ 8465

3. ✖ 71000

4. ✖ 3550

Question Number : 48 Question Id : 170527248 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

What is the correct relationship between internal energy (U) and partition function (q)?

Options :

1. ✖ $U = nR\left(\frac{dlnq}{dT}\right)_v$

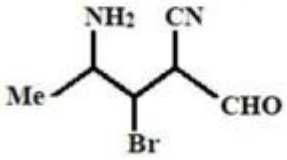
2. ✖ $U = nRT\left(\frac{dlnq}{dT}\right)_v$

3. ✖ $U = \frac{1}{nRT^2}\left(\frac{dlnq}{dT}\right)_v$

4. ✔ $U = nRT^2\left(\frac{dlnq}{dT}\right)_v$

Question Number : 49 Question Id : 170527249 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The IUPAC name of the following compound is



Options :

1. ✖ 4-Amino-3-bromo-2-cyanopentanal

2. ✔ 4-Amino-3-bromo-2-formylpentanenitrile

3. ✖ 4-Amino-3-bromo-2-formyl butanenitrile

4. ✖ 3-Bromo-4-cyano-4-formyl-2-butylamine

Question Number : 50 Question Id : 170527250 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which of the following will exist as a pair of enantiomers?

Options :

1. ✖ Trans-4-methylcyclohexanol

2. ✖ Trans-1,4-dichlorocyclohexane

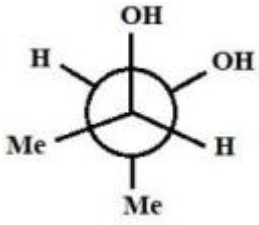
3. ✖ Cis-1,3-dichorocyclohexane

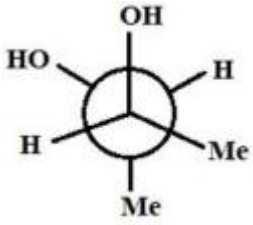
4. ✔ Cis-3-methylcyclohexanol

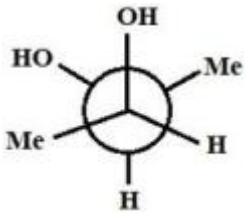
Question Number : 51 Question Id : 170527251 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

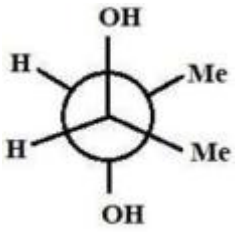
The preferred conformation of (2S, 3S)-butane-2,3-diol is

Options :

1. ✖ 

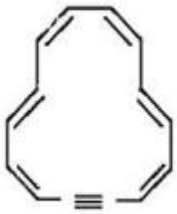
2. ✖ 

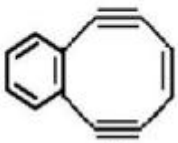
3. ✔ 

4. ✖ 

Question Number : 52 Question Id : 170527252 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Identify the correct statement regarding the following compounds (A) and (B)


(A)


(B)

Options :

1. ✔ ‘A’ is aromatic and ‘B’ is antiaromatic

2. ✖ ‘A’ is antiaromatic and ‘B’ is aromatic

3. ✖ Both ‘A’ and ‘B’ are aromatic

4. ✖ Both ‘A’ and ‘B’ are antiaromatic

Question Number : 53 Question Id : 170527253 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Pick up the correct option with respect to the carbene formed from photolysis of diazomethane

Options :

1. ✖ singlet, sp^2, bond angle 130-150°

2. ✔ singlet, sp^2, bond angle 100-110°

3. ✖ triplet, sp^2, bond angle 130-150°

4. ✖ triplet, sp, bond angle 100-110°

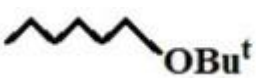
Question Number : 54 Question Id : 170527254 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Predict the major products ‘X’ and ‘Y’ from the following set of reactions

Options :

1. ✖ X =  Y = 

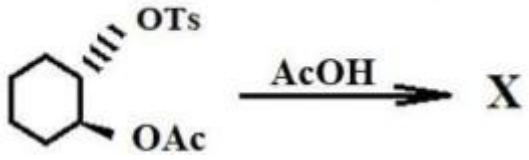
2. ✖ X =  Y = 

3. ✖ X =  Y = 

4. ✔ X =  Y = 

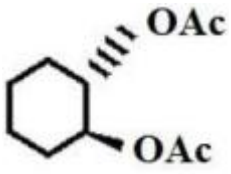
Question Number : 55 Question Id : 170527255 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

What is 'X' in the following reaction?

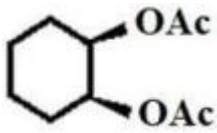


Options :

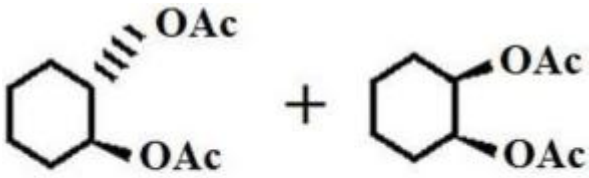
1. ✔



2. ✖

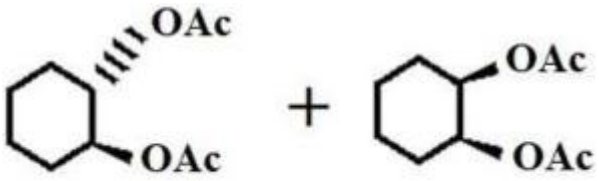


3. ✖



50% 50%

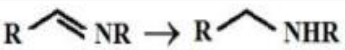
4. ✖



minor major

Question Number : 56 Question Id : 170527256 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Match the following

List I (Reaction)		List II (Reagent)	
A	$RCOOH \rightarrow RCH_2OH$	I	$DIBAL - H$
B	$RCOOEt \rightarrow RCH_2OH$	II	BH_3, THF
C	$RCOOEt \rightarrow RCHO$	III	$NaBH_4$
D		IV	$LiBH_4$
		V	$NaCNBH_3$

Correct answer is

Options :

1. ✖ A-V B-I C-II D-III

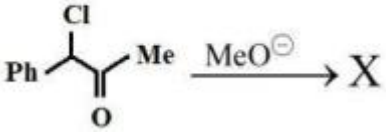
2. ✖ A-II B-I C-V D-III

3. ✔ A-II B-IV C-I D-V

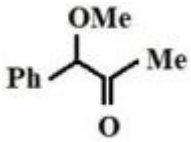
4. ✖ A-III B-IV C-I D-II

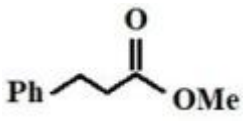
Question Number : 57 Question Id : 170527257 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

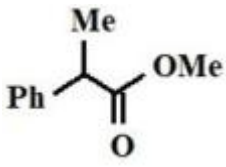
What is 'X' in the following reaction?



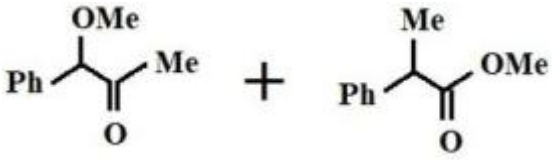
Options :

1. ✖ 

2. ✔ 

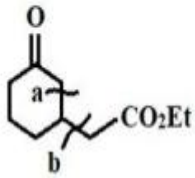
3. ✖ 

4. ✖

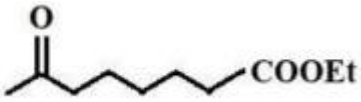


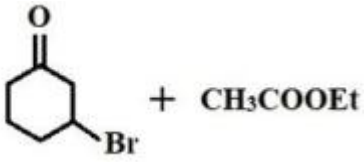
Question Number : 58 Question Id : 170527258 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

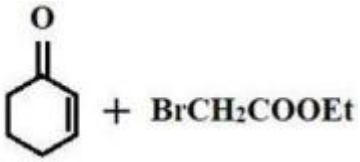
The feasible disconnection and synthetic equivalents of the following target molecule are

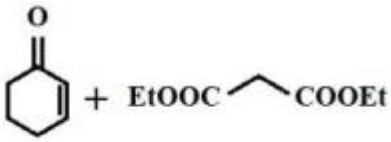


Options :

1. ✖ a ; 

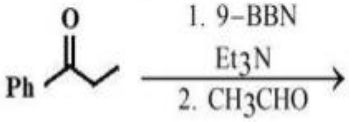
2. ✖ b ; 

3. ✖ b ; 

4. ✔ b ; 

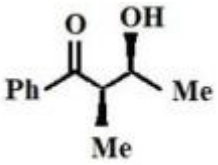
Question Number : 59 Question Id : 170527259 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

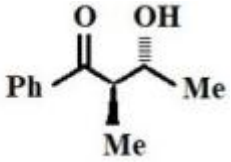
The configuration of enolate intermediate and major product formed in the following reaction sequence are respectively

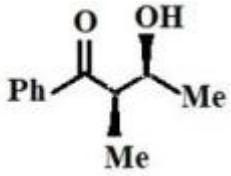


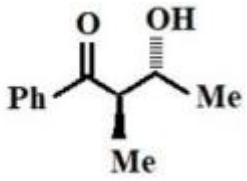
Options :

1. ✔

Z ; 

2. ✖ Z ; 

3. ✖ E ; 

4. ✖ E ; 

Question Number : 60 Question Id : 170527260 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

If one of the strands in DNA has the following sequence of bases

5'-G-A-C-T-3'

The sequence of bases in the complementary standard is

Options :

1. ✖ 3'-T-C-A-G-5'

2. ✔ 3'-C-T-G-A- 5'

3. ✖ 5'-C-T-G-A-3'

4. ✖ 5'-T-C-A-G-5'

Question Number : 61 Question Id : 170527261 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

An organic compound 'X' ($C_4H_8O_2$) displayed the following signals

IR: 3428 (br), 1714 cm^{-1}

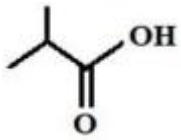
Mass: M^+=88, 45 (100%)

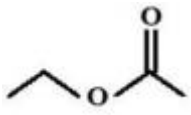
^{1}H-NMR: δ1.4 (d, 3H), 2.2 (s, 3H), 3.7 (br, 1H) 4.3 (q, 1H)

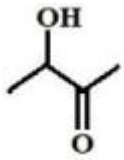
^{13}C-NMR: δ 18, 21, 71, 211

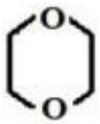
What is X?

Options :

1. ✖ 

2. ✖ 

3. ✔ 

4. ✖ 

Question Number : 62 Question Id : 170527262 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The configuration of hydroxy group and side chain in cholesterol are

Options :

1. ✔ Both β

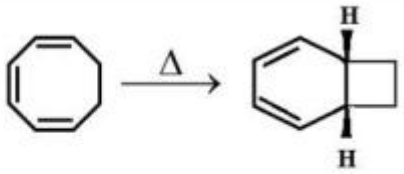
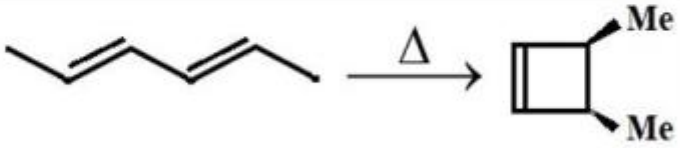
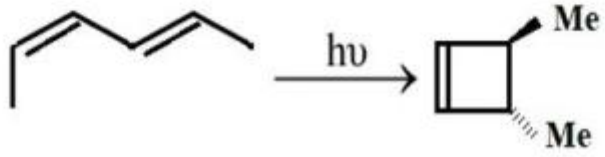
2. ✖ Both α

3. ✖ hydroxy group is β and side chain is α

4. ✖ hydroxy group is α and side chain is β

Question Number : 63 Question Id : 170527263 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which of the following reaction (s) is (are) forbidden?

(i)	
(ii)	
(iii)	

Options :

1. ✖ (i), (ii) only

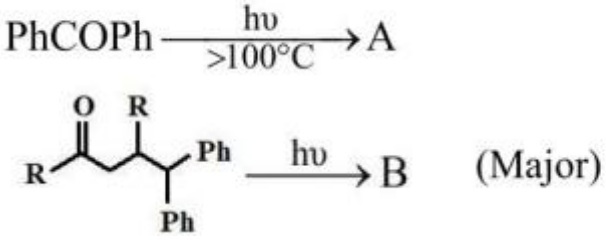
2. ✔ (ii) only

3. ✖ (i), (iii) only

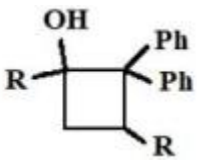
4. ✖ (ii), (iii) only

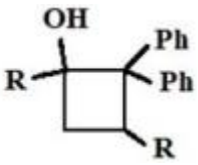
Question Number : 64 Question Id : 170527264 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Identify 'A' and 'B' in the following set of reactions



Options :

1. ✔ $A = Ph - Ph + CO$; B = 

2. ✖ $A = PhCOCOPh + Ph - Ph$; B = 

3. ✖ $A = Ph - Ph + CO$; $B = PhCOMe +$ 

4. ✖ $A = PhCOCOPH + Ph - Ph$; $B = PhCOMe +$ 

Question Number : 65 Question Id : 170527265 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Identify the correct statements from the following

(i) Ozone is more plentiful at the equator than near the poles

(ii) Ozone plays a key role in the stratosphere, while oxygen plays an important role in the troposphere

(iii) Freons have life times of the order of 100 years

Options :

1. ✖ (i), (ii) only

2. ✖ (i), (ii), (iii)

3. ✔ (ii), (iii) only

4. ✖ (i), (iii) only

Question Number : 66 Question Id : 170527266 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Biodegradation of organic matter in 500 mL of sample consumed 40 mg of O_2.

Its BOD (in mg/L) is

Options :

1. ✖ 40

2. ✖ 20

3. ✖ 25

4. ✔ 80

Question Number : 67 Question Id : 170527267 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The major source for SO_2 present in air is

Options :

1. ✔ Thermal power plants

2. ✖ Metallurgical plants

3. ✖ Paper mills

4. ✖ Textile mills

Question Number : 68 Question Id : 170527268 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The air pollutant/s responsible for damaging red blood cells are

Options :

1. ✖ Ammonia

2. ✔ Arsines

3. ✖ suspended particles

4. ✖ carbon dioxide

Question Number : 69 Question Id : 170527269 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

According to the standards prescribed by WHO for untreated water, the MPN index of coliform organisms in 90% of the samples examined should be

Options :

1. ✖ < 20

2. ✔ < 10

3. ✖ < 5

4. ✖ < 15

Question Number : 70 Question Id : 170527270 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Aircraft noise is expressed in

Options :

1. ✔ PNDB

2. ✖ dBA

3. ✖ dB

4. ✖ Wm^{-2}

Question Number : 71 Question Id : 170527271 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The hazardous waste may be

(i) explosive

(ii) corrosive

(iii) oxidising

Options :

1. ✖ (i), (ii) only

2. ✖ (ii), (iii) only

3. ✖ (i), (iii) only

4. ✔ (i), (ii), (iii)

Question Number : 72 Question Id : 170527272 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Water is sterilised by army people using

Options :

1. ✔ Chloramine

2. ✖ Chlorine

3. ✖ Bleaching powder

4. ✖ Potassium permanganate

Question Number : 73 Question Id : 170527273 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The indicator and the pH maintained to find out calcium hardness of water respectively, are

Options :

1. ✖ EBT, 10

2. ✖ Murexide, 10

3. ✔ Calcon, 12

4. ✖ Fast sulphon black, 12

Question Number : 74 Question Id : 170527274 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The metals which are protected by a layer of their own oxide are

(i) Al

(ii) Cr

(iii) Ni

The correct option is

Options :

1. ✖ (i), (iii) only

2. ✖ (ii), (iii) only

3. ✔ (i), (ii), (iii)

4. ✖ (i), (ii) only

Question Number : 75 Question Id : 170527275 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Observe the following statements

(i) The concentration of oxygen dissolved in water is greater at the water surface than deeper down

(ii) In galvanized iron sheets, zinc is anodic to iron

(iii) The rate of corrosion due to oxygen increases with rise in temperature

The correct statements are

Options :

1. ✖ (ii), (iii) only

2. ✖ (i), (ii) only

3. ✔ (i), (ii), (iii)

4. ✖ (i), (iii) only

Question Number : 76 Question Id : 170527276 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

In the atmospheric air the percentage of O_2 and N_2 by weight are 23% and 77% respectively. Then the mean molecular weight of air is

Options :

1. ✖ 29.9

2. ✖ 28.0

3. ✔ 28.9

4. ✖ 27.8

Question Number : 77 Question Id : 170527277 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The gas which is not recorded by Orsat apparatus is

Options :

1. ✖ CO

2. ✖ CO_2

3. ✖ O_2

4. ✔ SO_2

Question Number : 78 Question Id : 170527278 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The total phosphate content of water sample is determined spectrophotometrically by measuring the absorbance of the yellow reaction product 'X' at 460 nm. The 'X' is

Options :

1. ✖ Vanadophosphoric acid

2. ✖ Molybdophosphoric acid

3. ✔ Vanadomolybdophosphoric acid

4. ✖ Molybdoammonium phosphate

Question Number : 79 Question Id : 170527279 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

According to the Stefan-Boltzmann law, the radiative heat transfer is

Options :

1. ✔ proportional to fourth power of absolute temperature

2. ✖ proportional to cube of absolute temperature

3. ✖ proportional to square of absolute temperature

4. ✖ proportional to the absolute temperature

Question Number : 80 Question Id : 170527280 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Calculate log mean temperature difference for shell and tube exchanger for counter-current flow using the following data

Hot fluid 'in' temperature = 100 °C

Hot fluid 'out' temperature = 90 °C

Cold fluid 'in' temperature = 30 °C

Cold fluid 'out' temperature = 50 °C

(ln 1.2 = 0.182)

Options :

1. ✖ 40.4 °C

2. ✔ 54.9 °C

3. ✖ 61.6 °C

4. ✖ 14. 4 °C

Section B

Section Id :	1705276
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	20
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	1705276
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 170527281 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Choose the word that fits in the blank place so that the two words will have the same similar relation as that between first two words

Ammeter : Current : : Sphygmomanometer : _____

Options :

1. ✖ Humidity

2. ✔ Blood pressure

3. ✖ Wind vane

4. ✖ Strains

Question Number : 82 Question Id : 170527282 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

15 litres of milk and water mixture has 80% of milk in it. How much milk should be added to the mixture to have 90% of milk? (in litres)

Options :

1. ✔ 15

2. ✖ 18

3. ✖ 20

4. ✖ 24

Question Number : 83 Question Id : 170527283 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

If '+' denotes '×'; '–' denotes '÷'; '÷' denotes '+' and '×' denotes '–', then $15+24-3\times48\div63=$

Options :

1. ✖ 360

2. ✖ 245

3. ✖ 180

4. ✔ 135

Question Number : 84 Question Id : 170527284 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

7584 : 5362 : : 4673 : _____?

Options :

1. ✖ 2367

2. ✖ 2531

3. ✔ 2451

4. ✖ 3764

Question Number : 85 Question Id : 170527285 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The recipient of Dadasaheb Phalke Award for outstanding contribution to the growth and development of Indian Cinema at the 69th National Film Award ceremony is

Options :

1. ✖ Asha Parekh

2. ✖ Rajanikanth

3. ✖ Amitabh Bachchan

4. ✔ Waheeda Rehman

Question Number : 86 Question Id : 170527286 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Who has become the 1st Indian Athlete to win gold medal in the "World Athletic Championships 2023"

Options :

1. ✖ Shivpal Singh

2. ✔ Neeraj Chopra

3. ✖ Elizabeth Devenport

4. ✖ Davinder Singh Congo

Question Number : 87 Question Id : 170527287 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Where has India's 1st Solar Power City been inaugurated?

Options :

1. ✔ Sanchi (MP)

2. ✖ Aizwal (Mizoram)

3. ✖ Thrissur (Kerala)

4. ✖ Guwahati (Assam)

Question Number : 88 Question Id : 170527288 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Panchayati Raj system was introduced in India in the year

Options :

1. ✖ 1956

2. ✖ 1958

3. ✔ 1959

4. ✖ 1962

Question Number : 89 Question Id : 170527289 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The antonym for the word 'fragile' is

Options :

1. ✔ Sturdy

2. ✖ Frail

3. ✖ Brittle

4. ✖ Flimsy

Question Number : 90 Question Id : 170527290 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Choose the substitute of the underlined idiom/ phrase given below:

He has <u>hazy ideas</u> about life.

Options :

1. ✖ crude ideas

2. ✖ noble ideas

3. ✔ confused ideas

4. ✖ hazardous ideas

Question Number : 91 Question Id : 170527291 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Choose the ***correctly spelt*** word from the options:

Options :

1. ✔ acquaintance

2. ✖ acquaintence

3. ✖ accquaintance

4. ✖ acquentence

Question Number : 92 Question Id : 170527292 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Choose the grammatically correct sentence from the following sentences.

Options :

1. ✖ Radha as well as kamala have gone to Delhi.

2. ✖ I availed the opportunity.

3. ✖ The train left before I arrived.

4. ✔ The climate of India is better than the climate of Africa.

Question Number : 93 Question Id : 170527293 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

What is the ancient name of Adilabad district?

Options :

1. ✖ Yelagandula

2. ✔ Edulapuram

3. ✖ Manukota

4. ✖ Bikavolu

Question Number : 94 Question Id : 170527294 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The Warangal fort, a UNESCO World Heritage Site, was built during the reign of which dynasty?

Options :

1. ✖ Qutb Shahi dynasty

2. ✔ Kakatiya dynasty

3. ✖ Rashtrakuta dynasty

4. ✖ Vijayanagara empire

Question Number : 95 Question Id : 170527295 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

The traditional art of Telangana, which involves painting rural life and nature, is known as:

Options :

1. ✔ Cheriyal Scroll Painting

2. ✖ Madhubani Painting

3. ✖ Pattachitra

4. ✖ Gond Painting

Question Number : 96 Question Id : 170527296 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Kondapaka is the birth place of _____?

Options :

1. ✖ Goreti Venkanna

2. ✖ Suravaram Pratapa Reddy

3. ✔ Nandini Sidha Reddy

4. ✖ Burgula ramakrishna rao

Question Number : 97 Question Id : 170527297 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which of the following is not a standard built-in tool of Windows operating system?

Options :

1. ✔ MS Word

2. ✖ WordPad

3. ✖ MS Defender

4. ✖ Microsoft Edge

Question Number : 98 Question Id : 170527298 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

What is the shortcut key for manual line break in MS Word?

Options :

1. ✖ Ctrl+Enter

2. ✖ Alt+Enter

3. ✖ Ctrl+Alt+Enter

4. ✔ Shift+Enter

Question Number : 99 Question Id : 170527299 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which of the following cannot be used as a background of a slide in PowerPoint?

Options :

1. ✖ Picture

2. ✔ TextBox

3. ✖ Texture

4. ✖ Color Gradient

Question Number : 100 Question Id : 170527300 Question Type : MCQ Option Shuffling : Yes Correct Marks : 1 Wrong Marks : 0

Which of the following formula is available as a button on Excel Menu Bar?

Options :

1. ✔ Auto Sum

2. ✖ Auto Mean

3. ✖ Auto Correlation

4. ✖ Auto Count