National Testing Agency

Question Paper Name:	Chemical Science 899 30th May 2019 Shift 1 Set1
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Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Chemical Science 899

Group Number :	1
Group Id :	128206190
Group Maximum Duration :	0
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Revisit allowed for edit? :	No
Break time:	0
Group Marks:	100

PART A

Section Id :	128206319
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	25
Number of Questions to be attempted:	25
Section Marks:	50
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	128206515
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 12820611197 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

IR spectrum of trichloroacetaldehyde in the hydrated form (Chloral hydrate) and in the dried form, respectively, would show:

(a) A broad peak at 3400 cm^{-1} and a strong peak at 1770 cm^{-1}

(b) A sharp peak at 3400 cm^{-1} and a weak peak at 1770 cm^{-1}

(c) A broad peak at 3400 cm^{-1} and a weak peak at 1770 cm^{-1}

(d) A sharp peak at 3400 cm^{-1} and a strong peak at 1770 cm^{-1}

Options :
12820644247. A
12820644248. B
12820644249. C
12820644250. D

Question Number : 2 Question Id : 12820611198 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

For the exact mass determination of the bee alarm pheromone with a composition of $C_6H_{10}O_2$, the calculated and the observed mass are 114.068075 and 114.1039, respectively. The error in ppm is:

(a)   358

(b)   103

(c)   0.04

(d)   68

Options :
12820644251. A
12820644252. B
12820644253. C
12820644254. D

Question Number : 3 Question Id : 12820611199 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

There are four solvent bottles of MeCN, DMSO, DMF and DCM. Which solvent is the most polar?

(a)   DMF

(b)   DMSO

(c)   MeCN

(d)   DCM
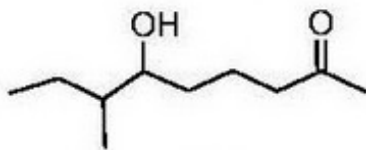
Options :
12820644255. A
12820644256. B
12820644257. C

12820644258. D

Question Number : 4 Question Id : 12820611200 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The dipole moments of CH_3Cl (**1**), CH_2Cl_2(**2**), $CHCl_3$(**3**) and CCl_4(**4**) are in the order of:

(a)   1>3>2>4

(b)   3>1>2>4

(c)   2>3>1>4

(d)   1>2>3>4

Options :
12820644259. A
12820644260. B
12820644261. C
12820644262. D

Question Number : 5 Question Id : 12820611201 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The IUPAC name of the compound given below is:

(a)   3-methyl-8-keto-nonan-4-ol

(b)   6-hydroxy-7-methylnonan-2-one

(c)   6-hydroxy-7-methyl-octan-2-one

(d)   2-ethyl-3-hydroxylacton-7-one

Options :
12820644263. A
12820644264. B
12820644265. C
12820644266. D

Question Number : 6 Question Id : 12820611202 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The % composition of Mg_3PO_4 is:

(a)   27.7% Mg; 23.6% P; 48.7% O

(b)   23.6% Mg; 27.7% P; 48.7% O

(c)   48.7% Mg; 27.7% P; 23.6% O

(d)   48.7% Mg; 23.6% P; 27.7% O

Options :

12820644267. A

12820644268. B

12820644269. C

12820644270. D

Question Number : 7 Question Id : 12820611203 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The language of DNA written in basis (A.T.G.C) is translated into that of a protein by the use of components, which of the following is not one of them?

(a) Ribosome

(b) Endosome

(c) t-RNA

(d) RNA Polymerase

Options :

12820644271. A

12820644272. B

12820644273. C

12820644274. D

Question Number : 8 Question Id : 12820611204 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

One mole of an ideal monoatomic gas is initially at a pressure P_1 and volume V_1. It undergoes an adiabatic expansion (i.e., without any transfer of heat) to a volume V_2 and pressure P_2. During this process, the specific heat of gas is:

(a) 5R/2

(b) 2R

(c) 3R/2

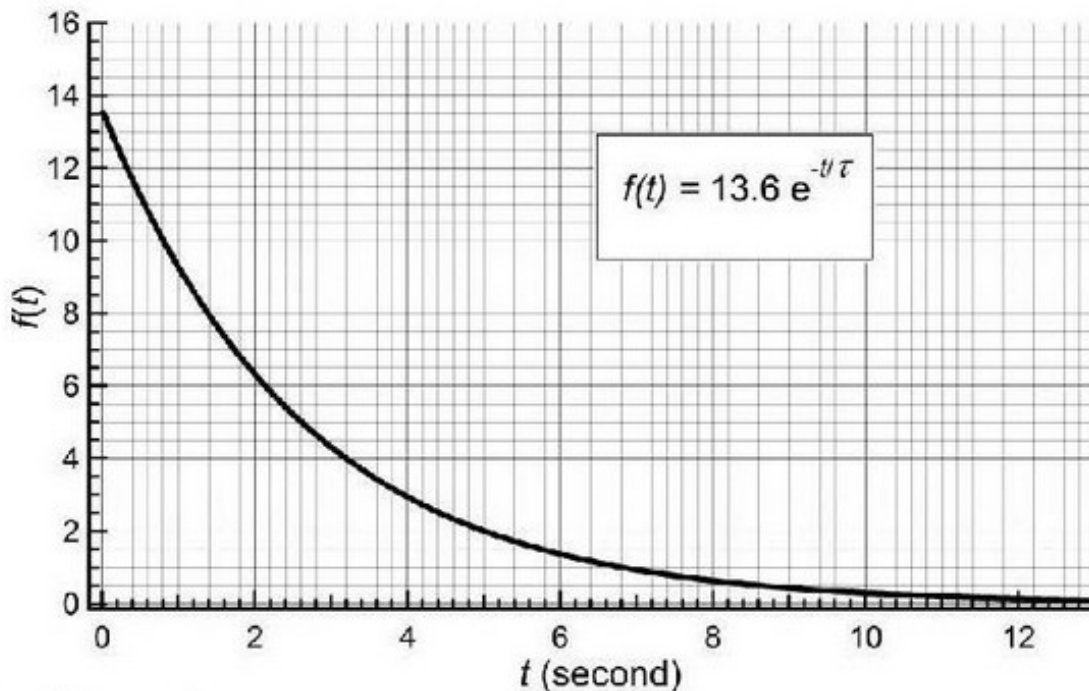(d) 0

Options :

12820644275. A

12820644276. B

12820644277. C

12820644278. D

Question Number : 9 Question Id : 12820611205 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

If an universal power supply (UPS) has the power delivering capacity of 1.7 kVA with the power factor of 0.8 then which following statement is correct:

(a) An instrument with running power requirement of 1 kWatt can be connected safely to the UPS.

(b) An instrument with running power requirement of 1.7 kWatt can be connected safely to the UPS.

(c) An instrument with running power requirement of any value lower than 2.5 kWatt can be connected safely to the UPS.

(d) The UPS cannot supply power to any instrument with running power requirement higher than 1 kWatt.

Options :

12820644279. A

12820644280. B

12820644281. C

12820644282. D

Question Number : 10 Question Id : 12820611206 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

A system response function, $f(t)$ decays with time (t) as shown in figure below. If the value of mathematical constant (e) is given by 2.72 then the time-constant (τ) of decay can be found as:

$$f(t) = 13.6\, e^{-t/\tau}$$

(a) 1.6 second.

(b) 2.6 second.

(c) 4.6 second.

(d) 13.6 second.

Options :

12820644283. A

12820644284. B

12820644285. C

12820644286. D

Question Number : 11 Question Id : 12820611207 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In a fluorescence spectrometer, a cuvette containing water is excited by light at 400 nm. The Stokes Raman band due to water O–H stretching frequency of 3400 cm^{-1} will appear at:

(a) 405 nm.

(b) 463 nm.

(c) 800 nm.

(d) 561 nm.

Options :

12820644287. A

12820644288. B

12820644289. C

12820644290. D

Question Number : 12 Question Id : 12820611208 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A substance A_xB_y crystallizes in a face centered cubic (FCC) lattice. 'A' atoms occupy each corner of the cube and 'B' atoms occupy the centers of each face of the cube. What will be the correct composition of the substance A_xB_y?

(a) AB_3

(b) A_4B_3

(c) A_3B

(d) A_8B_6

Options :
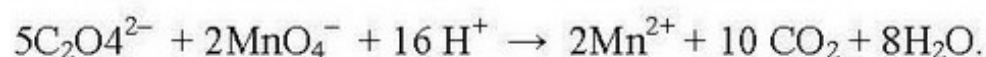
12820644291. A

12820644292. B

12820644293. C

12820644294. D

Question Number : 13 Question Id : 12820611209 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The standard oxidation potentials E^0 for half reactions are

$Zn \rightarrow Zn^{2+} + Ze$ 　　　 $E^0 = +0.76$ V

$Fe \rightarrow Fe^{2+} + Ze$ 　　　 $E^0 = +0.41$ V

The EMF of the cell reaction $Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$ is:

(a) 　 -0.35V.

(b) 　 +0.35V.

(c) 　 +1.17V.

(d) 　 -1.17V.

Options :

12820644295. A

12820644296. B

12820644297. C

12820644298. D

Question Number : 14 Question Id : 12820611210 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

With increase in temperature, physical adsorption:

(a) 　 Decreases.

(b) 　 Increases.

(c) 　 Increases and decreases.

(d) 　 No effect.

Options :

12820644299. A

12820644300. B

12820644301. C

12820644302. D

Question Number : 15 Question Id : 12820611211 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A sample containing sodium oxalate (molecular weight = 134) is titrated with 40.0 mL of 0.02(M) potassium permanganate in an acid solution. The concerned ionic equation is:

$5C_2O4^{2-} + 2MnO_4^- + 16 H^+ \rightarrow 2Mn^{2+} + 10 CO_2 + 8H_2O.$

The amount of sodium oxalate present in the sample is:

(a) 　 0.27 g

(b) 　 0.54 g

(c) 　 1.10 g

(d) 　 0.87 g

Options :

12820644303. A

12820644304. B

12820644305. C

12820644306. D

Question Number : 16 Question Id : 12820611212 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The inter-nuclear distance in HI is 1.62Å. If the measured dipole moment is 0.38 D, calculate the % ionic character of HI. Given, electronic charge (e) = 4.8 x 10^{-10}esu.

One Debye (1D) = 1.0 x 10^{-18}esu-cm = 3.36 x 10^{-30} C-m:

(a)   77.76

(b)   4.89

(c)   20.46

(d)   7.78

Options :

12820644307. A

12820644308. B

12820644309. C

12820644310. D

Question Number : 17 Question Id : 12820611213 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The color of the coordination compounds depends on the crystal field splitting. What will be the decreasing order of absorption wavelength in the visible region for the following complexes?

I. $[Co(NH_3)_6]^{3+}$

II. $[Co(H_2O)_6]^{3+}$

III. $[Co(CN)_6]^{3-}$

(a) I > II > III

(b) III > I > II

(c) II > III > I

(d) II > I > III

Options :

12820644311. A

12820644312. B

12820644313. C

12820644314. D

Question Number : 18 Question Id : 12820611214 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In the complex, $[Ni_2(\eta^5\text{-}Cp)_2(CO)_2]$, the IR stretching frequency appears at 1857 cm^{-1} (strong) and 1897 cm^{-1} (weak). The valence electron count and the nature of the M-CO bond respectively are:

(a)   16e$^-$, bridging.

(b)   17e$^-$, bridging.

(c)   18e$^-$, terminal.

(d)   18e$^-$, bridging.

Options :

12820644315. A

12820644316. B

12820644317. C

12820644318. D

Question Number : 19 Question Id : 12820611215 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which of the following mixture represents Zimmermann-Reinhardt's reagent?

(a)   Manganese(II) sulphate, sulphuric acid and phosphoric acid

(b)   Magnesium (II) sulphate, sulphuric acid and phosphorus acid

(c)   Zinc (II) Sulphate, sulphuric acid and phosphoric acid

(d)   Nickel (II) Sulphate, sulphuric acid and phosphorus acid

Options :

12820644319. A

12820644320. B

12820644321. C

12820644322. D

Question Number : 20 Question Id : 12820611216 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The pH that should be maintained for the complexometric titration of Mg^{2+} and Ca^{2+} with EDTA would be in the range of:

(a)   4-6.

(b)   9-10.

(c)   13-14.

(d)   1-3.

Options :

12820644323. A

12820644324. B

12820644325. C

12820644326. D

Question Number : 21 Question Id : 12820611217 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The pH of 0.1(M) aqueous acetic acid solution ($k_a = 1.75 \times 10^{-5}$) is:

(a) 4.60.

(b) 2.88.

(c) 3.33.

(d) 6.80.

Options :

12820644327. A

12820644328. B

12820644329. C

12820644330. D

Question Number : 22 Question Id : 12820611218 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

2-Acetoxy benzoic acid is commonly known as:

(a) Paracetamol.

(b) Ibuprofen.

(c) Asprin.

(d) Wintergreen oil.

Options :

12820644331. A

12820644332. B

12820644333. C

12820644334. D

Question Number : 23 Question Id : 12820611219 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which of the changes below occurs with the greatest increase in entropy?

(a) $Na_2O(s) + H_2O(l) \rightarrow 2Na^+(aq) + 2OH^-(aq)$

(b) $NH_3(g) + HCl(g) \rightarrow NH_4Cl(s)$

(c) $H_2(g) + I_2(g) \rightarrow 2HI(g)$

(d) $C(s) + CO_2(g) \rightarrow 2CO(g)$

Options :

12820644335. A

12820644336. B
12820644337. C
12820644338. D

Question Number : 24 Question Id : 12820611220 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A specimen is imaged in a fluorescence microscope using 532 nm excitation laser light. If an objective of numerical aperture (NA) of 1 is used to image the specimen then the minimum *spatial resolution* (XY-resolution) of the image will be:

(a)   1000 nm

(b)   1 nm

(c)   22 nm

(d)   266 nm

Options :

12820644339. A
12820644340. B
12820644341. C
12820644342. D

Question Number : 25 Question Id : 12820611221 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Victor Meyer test is commonly employed for the confirmation of:

(a)   1°, 2°, 3° amines

(b)   Carbonyl group

(c)   1°, 2°, 3° alcohols

(d)   2° and 3° alcohols only

Options :

12820644343. A
12820644344. B
12820644345. C
12820644346. D

<table>
<tr><td></td><td>PART B</td></tr>
<tr><td>**Section Id :**</td><td>128206320</td></tr>
<tr><td>**Section Number :**</td><td>2</td></tr>
<tr><td>**Section type :**</td><td>Online</td></tr>
<tr><td>**Mandatory or Optional:**</td><td>Mandatory</td></tr>
<tr><td>**Number of Questions:**</td><td>25</td></tr>
<tr><td>**Number of Questions to be attempted:**</td><td>25</td></tr>
<tr><td>**Section Marks:**</td><td>50</td></tr>
</table>

Sub-Section Number:	1
Sub-Section Id:	128206516
Question Shuffling Allowed :	Yes

Question Number : 26 Question Id : 12820611222 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In the reaction of R-OH with $SOCl_2$ in the presence of pyridine, the final product is **A**, the reaction follows **B** and the reaction is called **C**:

(a)   **A**: $R-SO_2Cl$, **B**: Inversion of configuration and **C**: S_N2

(b)   **A**: $R-SO_2$, **B**: Inversion of configuration and **C**: S_Ni

(c)   **A**: $R-SO_3H$, **B**: Retention of configuration and **C**: S_N2

(d)   **A**: $R-Cl$, **B**: Retention of configuration and **C**: S_Ni

Options :
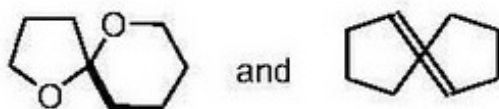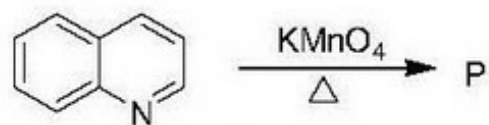
12820644347. A

12820644348. B
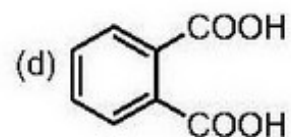
12820644349. C

12820644350. D

Question Number : 27 Question Id : 12820611223 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A phenolic ester is heated with Friedel-Crafts catalyst like $AlCl_3$. The products formed are:

(a)   *o-* and *p*-acylphenols.

(b)   *o-*, *m-* and *p*-acylphenols.

(c)   phenol.

(d)   alkylated phenols.

Options :

12820644351. A
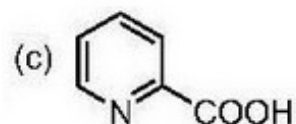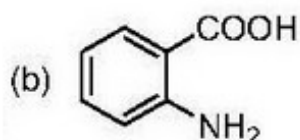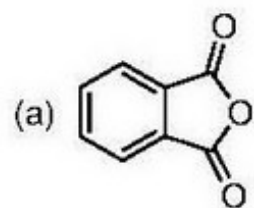
12820644352. B

12820644353. C

12820644354. D

Question Number : 28 Question Id : 12820611224 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The stability of α-glucoside compared to β-glucoside is:

(a) Greater due to the anomericeffectand also the dipoles are not parallel.

(b) Smaller due to the anomeric effect and also the dipoles parallel.

(c) Greater due to the anomeric effect and also the dipoles are parallel.

(d) Smaller due to the anomeric effect and also the dipoles are not parallel.

Options :
12820644355. A
12820644356. B
12820644357. C
12820644358. D

Question Number : 29 Question Id : 12820611225 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Which of the following species can act as Bronsted acid as well as Bronsted base?
I. NH_2^-
II. HCO_3^-
III. NH_4^+
IV. HSO_4^-

(a) I,II & IV

(b) I,III & IV

(c) II & IV

(d) I & III

Options :
12820644359. A
12820644360. B
12820644361. C
12820644362. D

Question Number : 30 Question Id : 12820611226 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The stereochemistry of the molecules shown below is:

and

(a) R and R.

(b) S and S.

(c) S and R.

(d) R and S.

Options :

12820644363. A

12820644364. B

12820644365. C

12820644366. D

Question Number : 31 Question Id : 12820611227 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

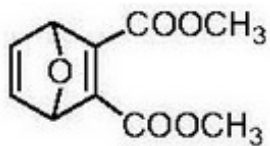In the reaction,

The product P is:

(a)

(b)

(c)

(d)

Options :

12820644367. A

12820644368. B

12820644369. C

12820644370. D

Question Number : 32 Question Id : 12820611228 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which one of the following will yield the above product?

(a)

(b)

(c)

(d)
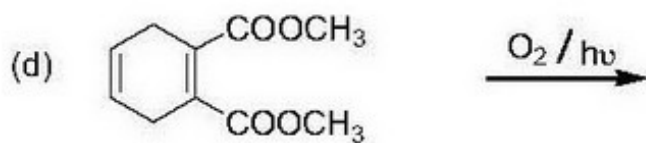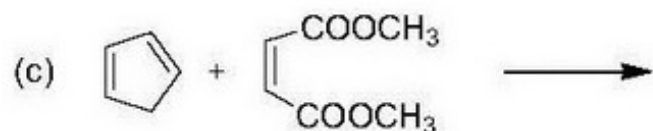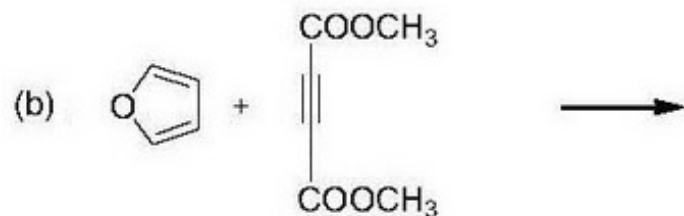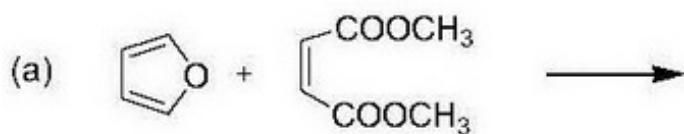
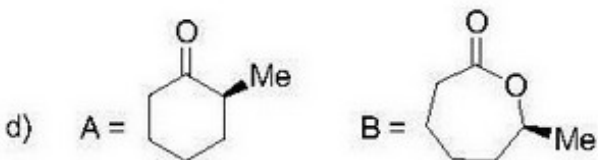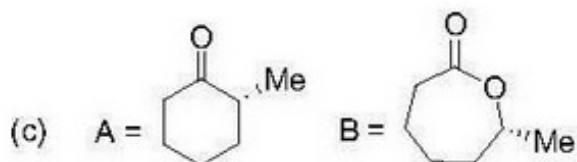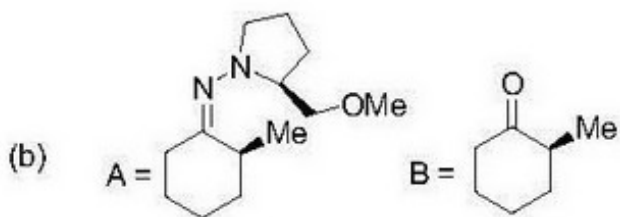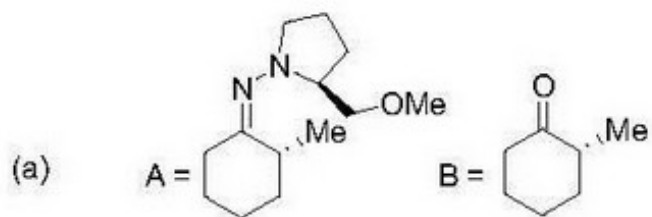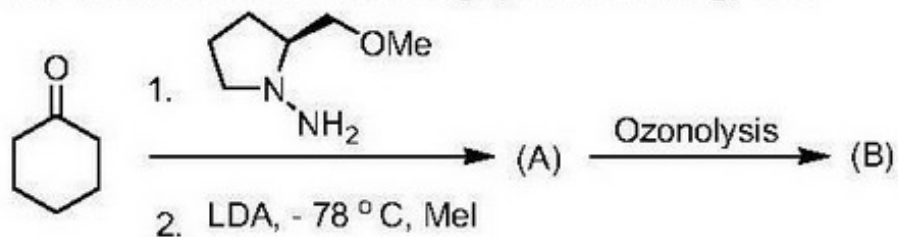**Options :**

12820644371. A

12820644372. B

12820644373. C

12820644374. D

Question Number : 33 Question Id : 12820611229 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The major products A and B in the following synthetic strategy are:

(a) A =   B =

(b) A =   B =

(c) A =   B =

d) A =   B =

Options :

12820644375. A

12820644376. B

12820644377. C

12820644378. D

Question Number : 34 Question Id : 12820611230 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Predict theincreasing order of bond angles in H_2O, NH_3, PH_3 and OCl_2:

(a) $PH_3 < H_2O < NH_3 < OCl_2$

(b) $NH_3 < H_2O < OCl_2 < PH_3$

(c) $H_2O < OCl_2 < NH_3 < PH_3$

(d) $PH_3 < OCl_2 < NH_3 < H_2O$
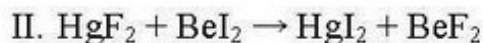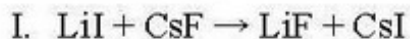
Options :

12820644379. A

12820644380. B

Question Number : 35 Question Id : 12820611231 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Using Hard-Soft Acid-Base (HSAB) concept, predict the direction of the following reactions.

Assume gas-phase reaction at 25 °C or in an inert solvent:

I. $LiI + CsF \rightarrow LiF + CsI$

II. $HgF_2 + BeI_2 \rightarrow HgI_2 + BeF_2$

(a)   I = Forward; II = Forward

(b)   I = Forward; II = Backward

(c)   I = Backward; II = Backward

(d)   I = Backward, II = Forward
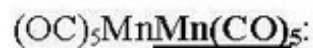
Options :

12820644383. A

12820644384. B

12820644385. C

12820644386. D

Question Number : 36 Question Id : 12820611232 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Based on the isolobal analogy, choose the group that might replace the group underlined in

$(OC)_5Mn\underline{Mn(CO)_5}$:

(a) CH_2

(b) BH_2

(c) CCH_3

(d)   I

Options :

12820644387. A

12820644388. B

12820644389. C

12820644390. D

Question Number : 37 Question Id : 12820611233 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Olefin hydrogenation using Wilkinson's catalyst initiates with:

(a)   Olefin addition to $Rh(PPh_3)_2Cl$.

(b)   Olefin addition to $Rh(PPh_3)_3Cl$.

(c)   A phosphine dissociation from $Rh(PPh_3)_3Cl$.

(d)   A phosphine addition to $Rh(PPh_3)_2Cl$.

Options :

12820644391. A

12820644392. B

12820644393. C

12820644394. D

Question Number : 38 Question Id : 12820611234 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Why does the absorption spectrum of aqueous $[Ti(H_2O)_6]^{3+}$ exhibit a broad band with a shoulder?

(a)   The ground state of $[Ti(H_2O)_6]^{3+}$ is Jahn-Teller distorted.

(b)   The excited state of $[Ti(H_2O)_6]^{3+}$ undergoes Jahn-Teller distortion.

(c) $[Ti(H_2O)_6]^{3+}$ is a d^2 ion and therefore there are two absorptions.

(d) $[Ti(H_2O)_6]^{3+}$ is partly reduced to $[Ti(H_2O)_6]^{2+}$ in aqueous solution and two absorptions which are close in energy are observed, one for each species.

Options :

12820644395. A

12820644396. B

12820644397. C

12820644398. D

Question Number : 39 Question Id : 12820611235 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The ground state term and magnetic moment of Tb^{3+} ion are:

(a) $^7F_6$ and 9.72 B. M., respectively.

(b) $^2F_6$ and 2.54 B. M., respectively.

(c) $^6H_{5/2}$ and 0.85 B. M., respectively.

(d) $^3H_6$ and 7.56 B. M., Respectively

Options :

12820644399. A

12820644400. B

12820644401. C

12820644402. D

Question Number : 40 Question Id : 12820611236 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Metal centers of following enzymes

(i) Superoxide dimutase and (ii) Nitrogenase are:

(a)   (i) Cu and Zn and (ii) Mo and Fe, respectively

(b)   (i) Mn and Zn and (ii) Zn and Fe, respectively

(c)   (i) Co and Zn and (ii) Cu and Fe, respectively

(d)   (i) Mg and Zn and (ii) Mn and Fe, respectively

Options :

12820644403. A

12820644404. B

12820644405. C

12820644406. D

Question Number : 41 Question Id : 12820611237 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The geometries of following molecules

(i) B_5H_9, (ii) $[B_6H_9]^-$ and (iii) $[B_9H_9]^{2-}$ are:

(a)   (i) Square pyramid, (ii) Pentagonal pyramid and (iii) Tricapped trigonal prism, respectively.

(b)   (i) Trigonal bipyramid, (ii) Octahedral and (iii) Tricapped trigonal prism, respectively.

(c)   (i) Square pyramid, (ii) Octahedral and (iii) Tricapped trigonal prism, respectively.

(d)   (i) Trigonal bipyramid, (ii) Pentagonal pyramid and (iii) Tricapped trigonal prism, respectively.

Options :

12820644407. A

12820644408. B

12820644409. C

12820644410. D

Question Number : 42 Question Id : 12820611238 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The Hamiltonian for hydrogen atom with reduced electron mass, μ_e, can be expressed as:

(a) $\hat{H} = \dfrac{h^2}{8\pi^2 \mu_e} \nabla^2 + \dfrac{e^2}{4\pi\varepsilon_0 r}$

(b) $\hat{H} = -\dfrac{h^2}{4\pi^2 \mu_e} \nabla^2 + \dfrac{e^3}{4\pi\varepsilon_0 r}$

(c) $\hat{H} = -\dfrac{h^2}{8\pi^2 \mu_e} \nabla^2 - \dfrac{e^2}{4\pi\varepsilon_0 r}$

(d) $\hat{H} = \dfrac{h^2}{8\pi^2 \mu_e} \nabla^2 - \dfrac{e^3}{4\pi\varepsilon_0 r}$
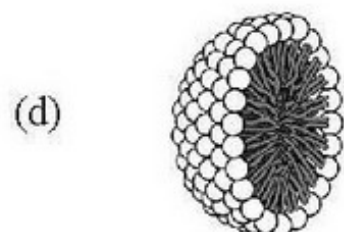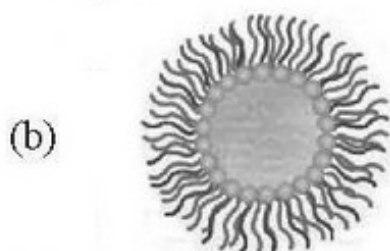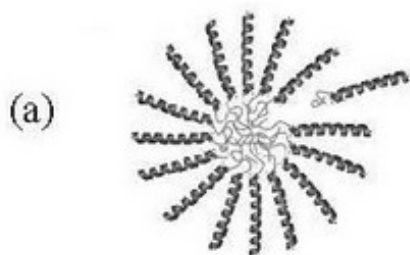
Options :

12820644411. A

12820644412. B

12820644413. C

12820644414. D

Question Number : 43 Question Id : 12820611239 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which of the following pictures is appropriate for *cyclodextrin* structure?

(a)

(b)

(c)

(d)

Options :

12820644415. A

12820644416. B

12820644417. C

12820644418. D

Question Number : 44 Question Id : 12820611240 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The half life of a chemical reaction is found to be inversely proportional to the cube of initial concentration of reactant. The order of the reaction is:
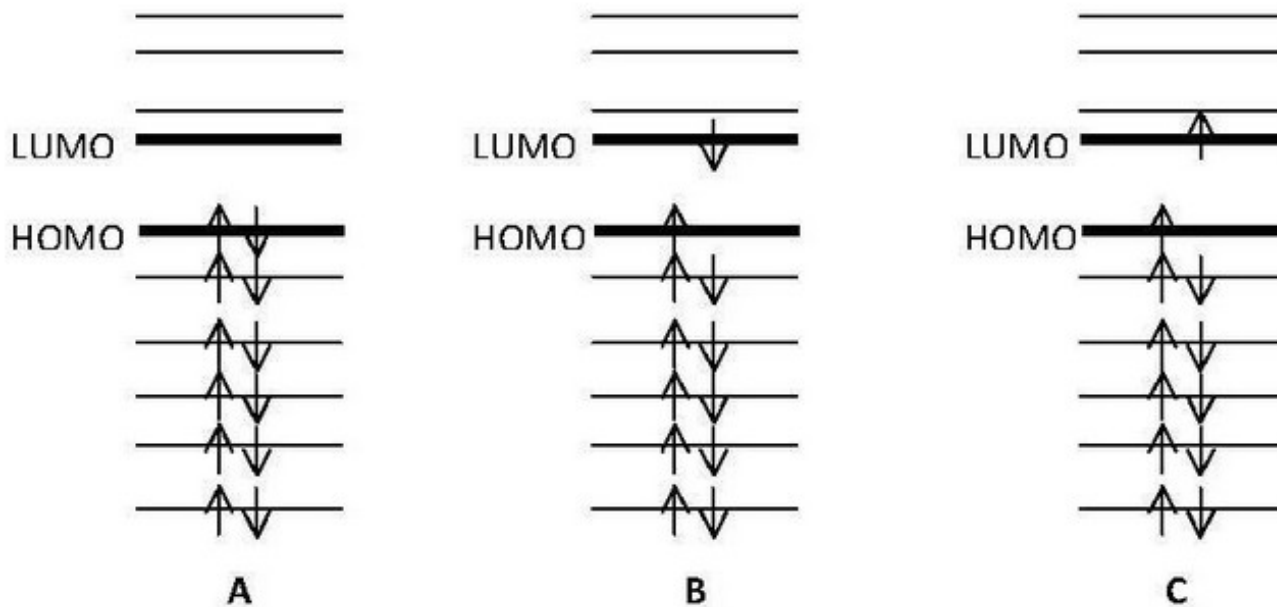
(a)   2.

(b)   3.

(c)   4.

(d)   5.

Options :

12820644419. A

12820644420. B

12820644421. C

12820644422. D

Question Number : 45 Question Id : 12820611241 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The molecular orbital electronic level description of a molecule is shown below.

A   B   C

The energy of transitions between the states follows the following correct order:

(a) $B \to A > A \to B > B \to C$

(b) $A \to B > B \to A > C \to A$

(c) $A \to B > B \to C > C \to A$

(d) $B \to A > C \to A > A \to B$

Options :

12820644423. A

12820644424. B

12820644425. C

12820644426. D

Question Number : 46 Question Id : 12820611242 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The independent variable in an experiment is:

(a)   The variable you hope to observe in an experiment.

(b)   The variable you change in an experiment.

(c)   The variable that isn't changed in an experiment.

(d)   none of these is correct.

Options :

12820644427. A

12820644428. B

12820644429. C

12820644430. D

Question Number : 47 Question Id : 12820611243 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which pair of electrodes (indicator and reference) can be used for determining the pH of a solution?

(a)   hydrogen electrode – quinine/hydroquinone electrode.

(b)   glass electrode – hydrogen electrode.

(c)   calomel – silver/silver chloride electrode.

(d)   hydrogen electrode – silver/silver chloride electrode.

Options :

12820644431. A

12820644432. B

12820644433. C

12820644434. D

Question Number : 48 Question Id : 12820611244 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

If you have 30 grams of lithium hydroxide dissolved to make 3L of a solution, the molarity of this solution is:

(a)   0.42 M.

(b)   1.26 M.

(c)   10.0 M.

(d)   20.0 M.

Options :

12820644435. A

12820644436. B

12820644437. C

12820644438. D

Question Number : 49 Question Id : 12820611245 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

With increasing temperature, the surface tension:

(a)   Increases, then decreases.

(b)   Decreases, then increases.

(c)   Decreases.

(d)   Increases.
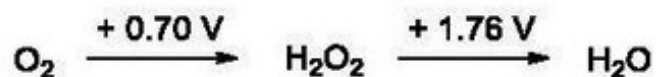
Options :

12820644439. A

12820644440. B

12820644441. C

12820644442. D

Question Number : 50 Question Id : 12820611246 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Consider the following Latimer diagram of oxygen in an acidic medium.

$$O_2 \xrightarrow{+\,0.70\ V} H_2O_2 \xrightarrow{+\,1.76\ V} H_2O$$

What is your anticipation about the above diagram?

(a) H_2O_2 should disproportionate into O_2 and H_2O, and the equilibrium constant (*Keq*) of the reaction is >1.

(b) H_2O_2 should disproportionate into O_2 and H_2O, and the equilibrium constant (*Keq*) of the reaction is <1.

(c) H_2O_2 should not disproportionate into O_2 and H_2O, and the equilibrium constant (*Keq*) of the reaction is >1.

(d) H_2O_2 should not disproportionate into O_2 and H_2O, and the equilibrium constant (*Keq*) of the reaction is <1.

Options :
12820644443. A
12820644444. B
12820644445. C
12820644446. D