

<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Mark As Answered Required? :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	708191910
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 31 Question Id : 70819116354 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

According to Bohr's atomic theory :

- (A) Kinetic energy of electron is  $\propto \frac{Z^2}{n^2}$ .
- (B) The product of velocity (v) of electron and principal quantum number (n),  $'vn' \propto Z^2$ .
- (C) Frequency of revolution of electron in an orbit is  $\propto \frac{Z^3}{n^3}$ .
- (D) Coulombic force of attraction on the electron is  $\propto \frac{Z^3}{n^4}$ .

Choose the most appropriate answer from the options given below :

**Options :**

70819154211. (A), (C) and (D) only

70819154212. (A) and (D) only

70819154213. (C) only

70819154214. (A) only

**Question Number : 32 Question Id : 70819116355 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

The correct shape and I–I–I bond angles respectively in  $I_3^-$  ion are :

**Options :**

70819154215. Linear;  $180^\circ$

70819154216. Distorted trigonal planar;  $135^\circ$  and  $90^\circ$

70819154217. T-shaped;  $180^\circ$  and  $90^\circ$

70819154218. Trigonal planar;  $120^\circ$

**Question Number : 33 Question Id : 70819116356 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Most suitable salt which can be used for efficient clotting of blood will be :

**Options :**

70819154219.  $NaHCO_3$

70819154220.  $Mg(HCO_3)_2$

70819154221.  $FeCl_3$

70819154222.  $FeSO_4$

**Question Number : 34 Question Id : 70819116357 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

The correct set from the following in which both pairs are in correct order of melting point is :

**Options :**

70819154223.  $\text{LiCl} > \text{LiF}$  ;  $\text{MgO} > \text{NaCl}$

70819154224.  $\text{LiF} > \text{LiCl}$  ;  $\text{MgO} > \text{NaCl}$

70819154225.  $\text{LiCl} > \text{LiF}$  ;  $\text{NaCl} > \text{MgO}$

70819154226.  $\text{LiF} > \text{LiCl}$  ;  $\text{NaCl} > \text{MgO}$

**Question Number : 35 Question Id : 70819116358 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Match List - I with List - II.

List - I (Metal)	List - II (Ores)
(a) Aluminium	(i) Siderite
(b) Iron	(ii) Calamine
(c) Copper	(iii) Kaolinite
(d) Zinc	(iv) Malachite

Choose the correct answer from the options given below :

**Options :**

70819154227. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

70819154228. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

70819154229. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

70819154230. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

**Question Number : 36 Question Id : 70819116359 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

**Assertion A :** Hydrogen is the most abundant element in the Universe, but it is not the most abundant gas in the troposphere.

**Reason R :** Hydrogen is the lightest element.

In the light of the above statements, choose the correct answer from the options given below :

**Options :**

70819154231. Both A and R are true and R is the correct explanation of A

70819154232. Both A and R are true but R is NOT the correct explanation of A

70819154233. A is true but R is false

70819154234. A is false but R is true

**Question Number : 37 Question Id : 70819116360 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Match List - I with List - II.

List - I (Salt)	List - II (Flame colour wavelength)
(a) LiCl	(i) 455.5 nm
(b) NaCl	(ii) 670.8 nm
(c) RbCl	(iii) 780.0 nm
(d) CsCl	(iv) 589.2 nm

Choose the correct answer from the options given below :

Options :

70819154235. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

70819154236. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

70819154237. (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)

70819154238. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Question Number : 38 Question Id : 70819116361 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No  
Correct Marks : 4 Wrong Marks : 1

The incorrect statement among the following is :

Options :

70819154239.  $\text{VO}_2$  is a reducing agent

70819154240.  $\text{RuO}_4$  is an oxidizing agent

70819154241.  $\text{Cr}_2\text{O}_3$  is an amphoteric oxide

70819154242. Red colour of ruby is due to the presence of  $\text{Co}^{3+}$

**Question Number : 39 Question Id : 70819116362 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

What is the correct order of the following elements with respect to their density ?

**Options :**

70819154243.  $\text{Cr} < \text{Fe} < \text{Co} < \text{Cu} < \text{Zn}$

70819154244.  $\text{Zn} < \text{Cr} < \text{Fe} < \text{Co} < \text{Cu}$

70819154245.  $\text{Zn} < \text{Cu} < \text{Co} < \text{Fe} < \text{Cr}$

70819154246.  $\text{Cr} < \text{Zn} < \text{Co} < \text{Cu} < \text{Fe}$

**Question Number : 40 Question Id : 70819116363 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

The calculated magnetic moments (spin only value) for species  $[\text{FeCl}_4]^{2-}$ ,  $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$  and  $\text{MnO}_4^{2-}$  respectively are :

**Options :**

70819154247. 4.90, 0 and 1.73 BM

70819154248. 5.92, 4.90 and 0 BM

70819154249. 5.82, 0 and 0 BM

70819154250. 4.90, 0 and 2.83 BM

**Question Number : 41 Question Id : 70819116364 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

**Statement I :** The value of the parameter “Biochemical Oxygen Demand (BOD)” is important for survival of aquatic life.

**Statement II :** The optimum value of BOD is 6.5 ppm.

In the light of the above statements, choose the most appropriate answer from the options given below :

**Options :**

70819154251. Both Statement I and Statement II are true

70819154252. Both Statement I and Statement II are false

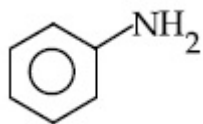
70819154253. Statement I is true but Statement II is false

70819154254. Statement I is false but Statement II is true

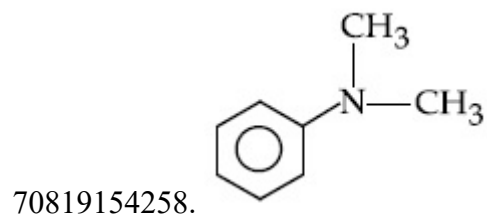
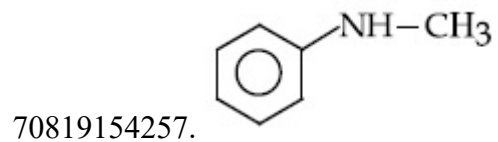
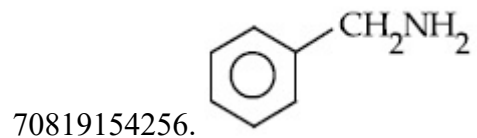
**Question Number : 42 Question Id : 70819116365 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

The diazonium salt of which of the following compounds will form a coloured dye on reaction with  $\beta$ -Naphthol in NaOH ?

**Options :**



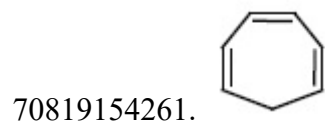
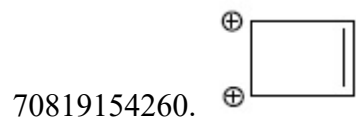
70819154255.



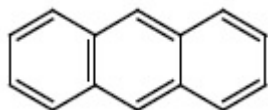
**Question Number : 43 Question Id : 70819116366 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Which one of the following compounds is non-aromatic ?

**Options :**





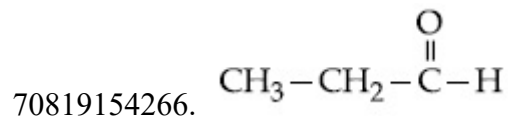
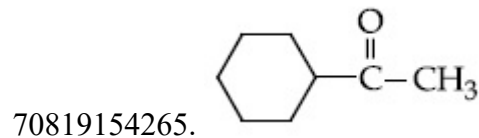
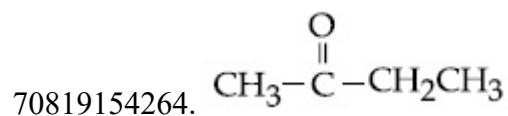
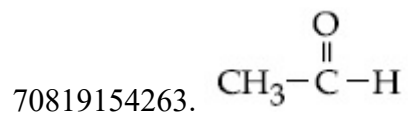


70819154262.

**Question Number : 44 Question Id : 70819116367 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

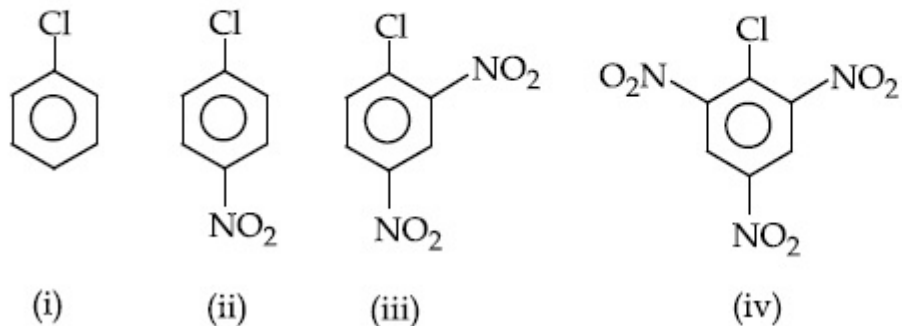
Which one of the following carbonyl compounds cannot be prepared by addition of water on an alkyne in the presence of  $\text{HgSO}_4$  and  $\text{H}_2\text{SO}_4$  ?

**Options :**



**Question Number : 45 Question Id : 70819116368 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

The correct order of the following compounds showing increasing tendency towards nucleophilic substitution reaction is :



Options :

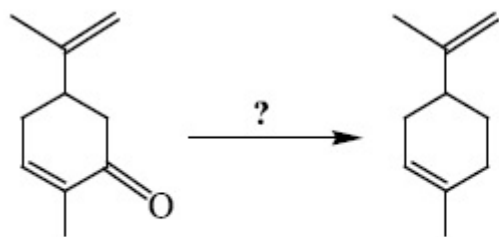
70819154267. (iv) < (iii) < (ii) < (i)

70819154268. (iv) < (i) < (iii) < (ii)

70819154269. (i) < (ii) < (iii) < (iv)

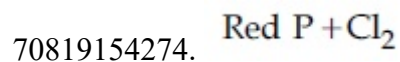
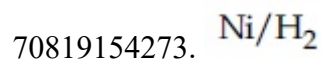
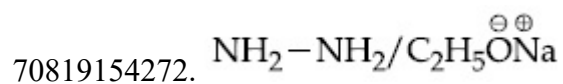
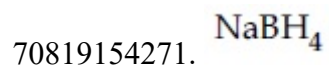
70819154270. (iv) < (i) < (ii) < (iii)

Question Number : 46 Question Id : 70819116369 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1



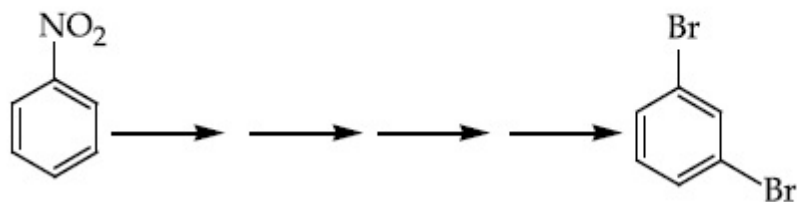
Which of the following reagent is suitable for the preparation of the product in the above reaction ?

Options :

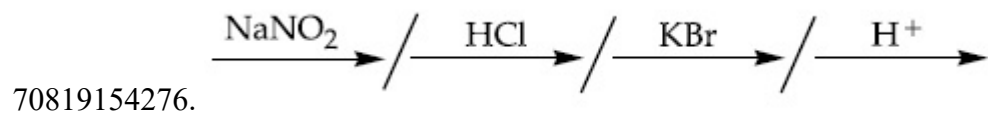
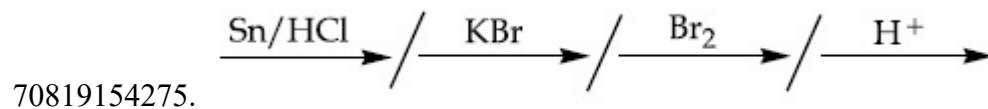


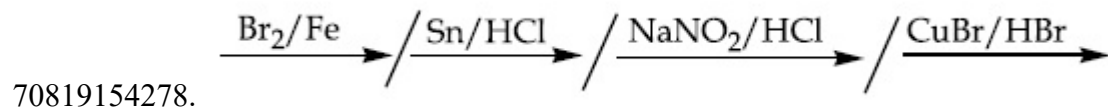
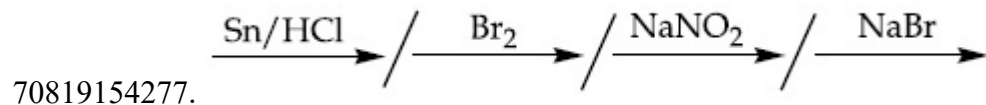
Question Number : 47 Question Id : 70819116370 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No  
Correct Marks : 4 Wrong Marks : 1

What is the correct sequence of reagents used for converting nitrobenzene into *m*-dibromobenzene ?



Options :





**Question Number : 48 Question Id : 70819116371 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

In polymer Buna-S : 'S' stands for :

**Options :**

70819154279. Sulphur

70819154280. Strength

70819154281. Styrene

70819154282. Sulphonation

**Question Number : 49 Question Id : 70819116372 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

**Match List - I and List - II.**

**List - I**

- (a) Valium
- (b) Morphine
- (c) Norethindrone
- (d) Vitamin B<sub>12</sub>

**List - II**

- (i) Antifertility drug
- (ii) Pernicious anaemia
- (iii) Analgesic
- (iv) Tranquilizer

**Options :**

70819154283. (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

70819154284. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

70819154285. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

70819154286. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

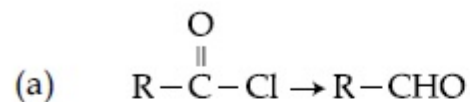
**Question Number : 50 Question Id : 70819116373 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match List - I and List - II.

**List - I**

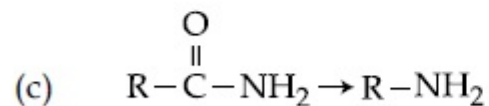
**List - II**



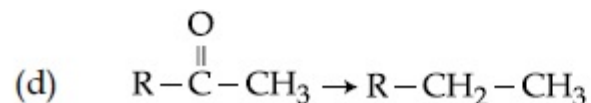
(i)  $\text{Br}_2/\text{NaOH}$



(ii)  $\text{H}_2/\text{Pd}-\text{BaSO}_4$



(iii)  $\text{Zn}(\text{Hg})/\text{Conc. HCl}$



(iv)  $\text{Cl}_2/\text{Red P, H}_2\text{O}$

Choose the correct answer from the options given below :

**Options :**

70819154287. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

70819154288. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

70819154289. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

70819154290. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

## Chemistry Section B

Section Id :	708191631
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191911
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 70819116374 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The formula of a gaseous hydrocarbon which requires 6 times of its own volume of  $O_2$  for complete oxidation and produces 4 times its own volume of  $CO_2$  is  $C_xH_y$ . The value of  $y$  is

\_\_\_\_\_.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819116375 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The volume occupied by 4.75 g of acetylene gas at 50°C and 740 mmHg pressure is \_\_\_\_\_ L. (Rounded off to the nearest integer)

[Given  $R = 0.0826 \text{ L atm K}^{-1} \text{ mol}^{-1}$ ]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

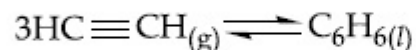
Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819116376 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Assuming ideal behaviour, the magnitude of  $\log K$  for the following reaction at 25°C is  $x \times 10^{-1}$ . The value of  $x$  is \_\_\_\_\_. (Integer answer)



[Given :  $\Delta_f G^\circ(\text{HC}\equiv\text{CH}) = -2.04 \times 10^5 \text{ J mol}^{-1}$  ;  $\Delta_f G^\circ(\text{C}_6\text{H}_6) = -1.24 \times 10^5 \text{ J mol}^{-1}$  ;  $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$ ]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

**Question Number : 54 Question Id : 70819116377 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

$C_6H_6$  freezes at  $5.5^\circ C$ . The temperature at which a solution of 10 g of  $C_4H_{10}$  in 200 g of  $C_6H_6$  freeze is \_\_\_\_\_  $^\circ C$ . (The molal freezing point depression constant of  $C_6H_6$  is  $5.12^\circ C/m$ .)

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

5 to 5.001

**Question Number : 55 Question Id : 70819116378 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

The solubility product of  $PbI_2$  is  $8.0 \times 10^{-9}$ . The solubility of lead iodide in 0.1 molar solution of lead nitrate is  $x \times 10^{-6}$  mol/L. The value of  $x$  is \_\_\_\_\_. (Rounded off to the nearest integer)

[Given  $\sqrt{2} = 1.41$ ]

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

5 to 5.001

**Question Number : 56 Question Id : 70819116379 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**



The magnitude of the change in oxidising power of the  $\text{MnO}_4^-/\text{Mn}^{2+}$  couple is  $x \times 10^{-4}$  V, if the  $\text{H}^+$  concentration is decreased from 1 M to  $10^{-4}$  M at  $25^\circ\text{C}$ . (Assume concentration of  $\text{MnO}_4^-$  and  $\text{Mn}^{2+}$  to be same on change in  $\text{H}^+$  concentration). The value of  $x$  is \_\_\_\_\_. (Rounded off to the nearest integer)

$$\left[ \text{Given : } \frac{2.303 RT}{F} = 0.059 \right]$$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

5 to 5.001

**Question Number :** 57 **Question Id :** 70819116380 **Question Type :** SA

**Correct Marks :** 4 **Wrong Marks :** 0

Sucrose hydrolyses in acid solution into glucose and fructose following first order rate law with a half-life of 3.33 h at  $25^\circ\text{C}$ . After 9 h, the fraction of sucrose remaining is  $f$ . The value

of  $\log_{10} \left( \frac{1}{f} \right)$  is \_\_\_\_\_  $\times 10^{-2}$ . (Rounded off to the nearest integer)

[Assume :  $\ln 10 = 2.303$ ,  $\ln 2 = 0.693$ ]

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

5 to 5.001

Question Number : 58 Question Id : 70819116381 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following allotropic forms of sulphur, the number of allotropic forms, which will show paramagnetism is \_\_\_\_\_.

- (A)  $\alpha$ -sulphur      (B)  $\beta$ -sulphur      (C)  $S_2$ -form

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

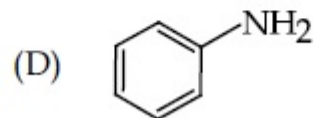
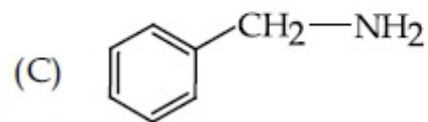
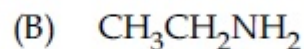
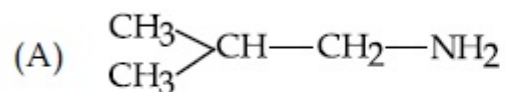
Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819116382 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The total number of amines among the following which can be synthesized by Gabriel synthesis is \_\_\_\_\_.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

**Question Number : 60 Question Id : 70819116383 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

1.86 g of aniline completely reacts to form acetanilide. 10% of the product is lost during purification. Amount of acetanilide obtained after purification (in g) is \_\_\_\_\_  $\times 10^{-2}$ .

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

5 to 5.001