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Previous Year Paper

Chemistry - 2019

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Multiple Choice Questions

1. A process will be spontaneous at all temperatures if :

- A. $\Delta H < 0$ and $\Delta S < 0$
- B. $\Delta H < 0$ and $\Delta S > 0$
- C. $\Delta H > 0$ and $\Delta S > 0$
- D. $\Delta H > 0$ and $\Delta S < 0$

Answer

2. At 300K and 1 atmospheric pressure 10ml of a hydrocarbon required 55mL of O_2 for complete combustion and 40mL of CO_2 is formed. The formula of the hydrocarbon is:

- A. C_4H_6
- B. C_4H_7Cl
- C. C_4H_8
- D. C_4H_{10}

Answer

3. During the change of O_2 to O_2^- , the incoming electrons goes to the orbital;

- A. $\pi^* 2p_x$
- B. $\pi 2p_x$
- C. $\sigma^* 2p_x$
- D. $\pi 2p_y$

Answer

4. Consider the following table:

Gas	$a/(\text{kPa dm}^6\text{mol}^{-1})$	$b/(\text{dm}^3\text{mol}^{-1})$
A	642.32	0.05196
B	155.21	0.04136
C	431.91	0.05196
D	155.21	0.4382

And b are vander walls constants . The correct statement about the gases is :

- A. Gas A will occupy than gas D - Compressible than gas D Gas C will occupy more

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than

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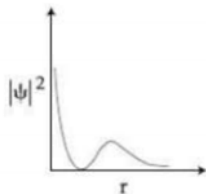
C. Gas A gas B will be more compressible than gas D Gas C will Occupy Lesser volume

than

D. Gas A: gas B will be lesser Compressible than gas D

Answer

5. The graph between Ψ^2 and r (radial distance) is shown below. This represents



- A. 2s orbital
- B. 2p orbital
- C. 3s orbital
- D. 1s orbital

Answer

6. Consider the following statements

- a) The pH of a mixture containing 400mL of 0.1M H_2SO_4 and 400 mL of 0.1M NaOH will be approximately 1.3.
- b) Ionic product of water is temperature dependent.
- c) A monobasic acid with $K_a=10^{-5}$ has a $\text{pH}=5$. The degree of dissociation of this acid is 50%.
- d) The Le Chatelier's Principle is not applicable to common-ion effect.

The correct statements are

- A. b and c
- B. a,b and d
- C. a,b, and c
- D. a and b

Answer

7. The correct order of catenation is

- A. $\text{Si} > \text{Sn} > \text{C} > \text{Ge}$
- B. $\text{C} > \text{Sn} > \text{Si} \approx \text{Ge}$
- C. $\text{Ge} > \text{Sn} > \text{Si} > \text{C}$
- D. $\text{C} > \text{Si} > \text{Ge} \approx \text{C}$

Answer

8. The isoelectronic set of ions is :

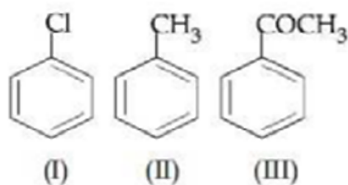
- A. Li^+ , Na^+ , O^{2-} and F^-

B. N^{3-} , O^{2-} , F^- and Na^+
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D, N³⁻, Li⁺, Mg²⁺ and O²⁻
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Answer

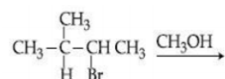
9. The increasing order of the reactivity of the following compounds towards electrophilic aromatic substitution reactions is :



- A. III < I < II
B. III < II < I
C. I < III < II
D. II < I < III

Answer

10. The major product of the following reaction is :



- A. $\text{CH}_3 - \overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}} - \text{CH} = \text{CH}_2$
B. $\text{CH}_3 - \overset{\text{CH}_3}{\text{C}} = \text{CH} - \text{CH}_3$
C. $\text{CH}_3 - \overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}} - \underset{\text{OCH}_3}{\text{CH}} - \text{CH}_3$
D. $\text{CH}_3 - \overset{\text{CH}_3}{\underset{\text{OCH}_3}{\text{C}}} - \text{CH}_2 - \text{CH}_3$

Answer

11. The alloy used in the construction of aircrafts is :
A. Mg-Al
B. Mg-Mn
C. Mg-Zn
D. Mg-Sn

Answer

12. The principle of Column Chromatography is
A. Capillary action
B. Differential absorption of the substances on the solid phase
C. Differential absorption of the substances on the phase

D. Gravation force
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13. The regions of the atmosphere, where clouds form where we live respectively, are
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A. Troposphere and stratosphere

B. Stratosphere and Troposphere

C. Stratosphere and Stratosphere

D. Troposphere and Troposphere

Answer

14. A gas undergoes physical adsorption on a surface and follows the given freundlich adsorption isotherm equation $x/m = kP^{0.5}$. Adsorption of the gas increases with:

A. increase in P and decrease in T

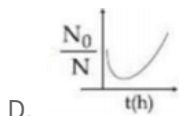
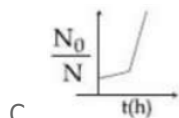
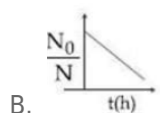
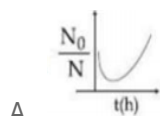
B. Decrease in P and decrease in T

C. Increase in P and Increase in T

D. Decrease in P and Increase in T

Answer

15. A bacterial infection in an initial wound grows $N_0(t) = N_0 \exp(t)$, here the time t is in hours. A dose of antibiotic, taken orally, needs 1 hour to reach the wound. Once it reaches there, the bacterial Population goes down as $\frac{dN}{dt} = -5N$. What will be plot of $\frac{N_0}{N}$ vs t after 1 hour



Answer

16. The species that can have a trans-isomer (en=ethane-1,2-diamine, ox=oxalate)

A. $[\text{Cr}(\text{en})_2(\text{ox})]^+$

B. $[\text{Pr}(\text{en})_2\text{Cl}_2]^{2+}$

C. $[\text{Zn}(\text{en})\text{Cl}_2]$

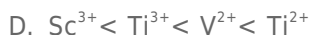
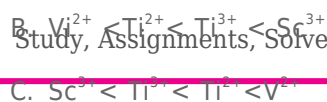
D. $[\text{Pt}(\text{en})\text{Cl}_2]$

Answer

17. Consider the hydrated ions of Ti^{2+} , V^{2+} , Ti^{3+} and Sc^{3+} . The correct order of their spin only magnetic moments is :

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Answer

18. Three complex $[\text{CoCl}(\text{NH}_3)_5]^{2+}$ (I) $[\text{Co}(\text{NH}_3)_5\text{H}_2\text{O}]^{3+}$ (II) and $[\text{Co}(\text{NH}_3)_6]^{3+}$ (III) absorb light in the visible region . the correct order of the wavelength of light absorbed by them is :



Answer

19. The oxoacid of sulphur that does not contain bond between sulphur atoms is :



Answer

20. At room temperature a dilute solution of urea is prepared by dissolving 0.60g of urea in 360g of water . If the vapour pressure of pure water at this temperature is 35mmHg , Lowering of vapour pressure will be (molar mass of urea =60g mol⁻¹).



Answer

21. Consider the statement S1 and S2:

S1: Conductivity always increases with decreases in the concentration of electrolyte

S2: Molar Conductivity always increase with decreases in the concentration of Electrolyte.

The correct option among the following



Answer

22. Match the refining methods (column I) with metals (column-II)

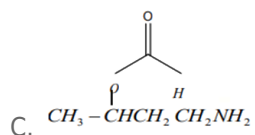
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Chemistry JEE 2019		Exam Year 2019	
Column I Refining methods		Column II Metal	
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I) Liquefaction		a) Zr	
II) Zone refining		b) Ni	
III) Mond process		c) Sn	
IV) Van Arkel Method		d) Ga	

- A. I-b, II- c, III-d, IV-a
 B. I-c, II-d, III-b, IV-a
 C. I-c, II-a, III-b, IV-d
 D. I-b, II-d, III-a, IV-c

Answer

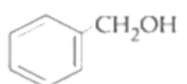
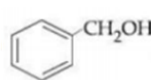
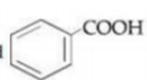
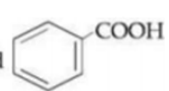
23. The major product of the following reaction is
 $\text{CH}_3\text{CHOHCH}_2\text{CH}_2\text{NH}_2 \xrightarrow{\text{triethylamineethyl formate (1 equiv.)}}$

- A. $\text{CH}_3\text{CH}=\text{CH}-\text{CH}_2\text{NH}_2$
 B. $\text{CH}_3-\text{CHOH}-\text{CH}=\text{CH}_2$
 C. 
 D. $\text{CH}_3-\text{CHOHCH}_2\text{CH}_2\text{NHCHO}$

Answer

24. Major products of the following reaction are



- A. HCOOH and 
 B. CH_3OH and HCO_2H
 C.  and 
 D. CH_3OH and 

Answer

25. Which of the following is a condensation polymer?

- A. Buna-S

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C. Nylon 6,6

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D. Neoprene

Answer

26. Ethylamine ($C_2H_5NH_2$) can be obtained from N-ethipthalimide on treatment with

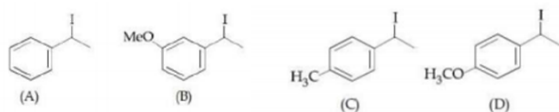
- A. CaH_2
- B. H_2O
- C. $NaBH_4$
- D. NH_2NH_2

Answer

27. Amylopectin is composed of:

- A. β -D-glucose C_1-C_4 and C_2-C_6 linkages
- B. β -D-glucose C_1-C_4 and C_1-C_6 linkages
- C. α -D-glucose C_1-C_4 and C_2-C_6 linkages
- D. α -D-glucose C_1-C_4 and C_1-C_6 linkages

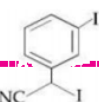
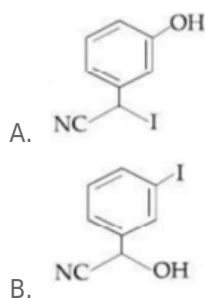
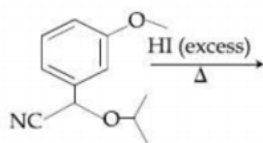
Answer

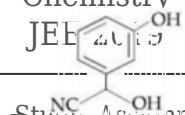
28. Increasing rate of S_N1 reaction in the following compounds is :

- A. $(B) < (A) < (C) < (D)$
- B. $(A) < (B) < (D) < (C)$
- C. $(B) < (A) < (D) < (C)$
- D. $(A) < (B) < (C) < (D)$

Answer

29. The major product of the following reaction is :





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Answer

30. The synonym for water gas when used in the production of methanol is :

- A. Laughing gas
- B. syngas
- C. fuel gas
- D. natural gas

Answer