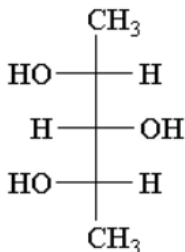


Placement Exam – Organic & Inorganic Chemistry Sample Questions

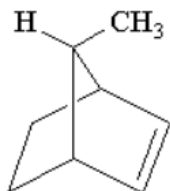
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1. Which of the following compounds exhibit optical activity?

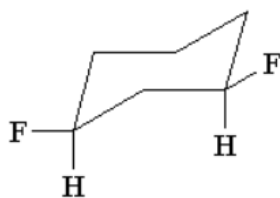
(a)



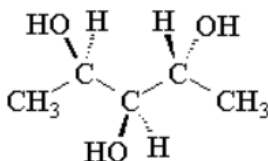
(b)



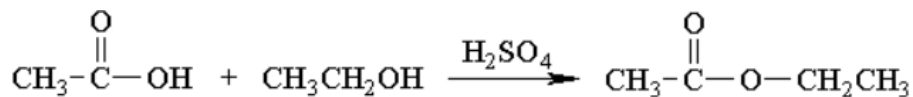
(c)



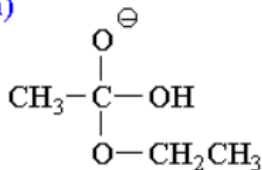
(d)



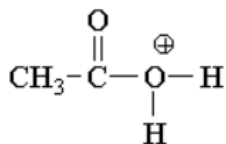
2. Which of the following is an intermediate in the mechanism of the acid catalyzed formation of an ester?



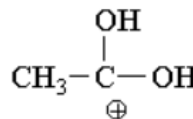
(a)



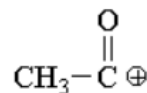
(b)



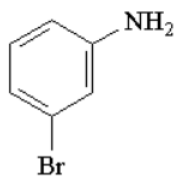
(c)



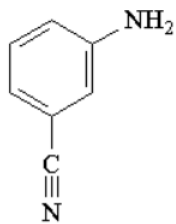
(d)



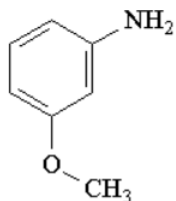
3. Which of the following compounds is the best Brønsted base?



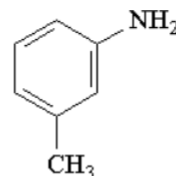
(a)



(b)



(c)



(d)

4. Which of the following  $\sigma$ -bonded alkyl groups can undergo  $\beta$ -hydrogen elimination?

(a)  $-\text{CH}_2\text{CH}_3$

(b)  $-\text{CH}_2\text{Ph}$

(c)  $-\text{CH}_3$

(d)  $-\text{CH}_2\text{SiMe}_3$

5. What is the molecular shape and the hybridization of the nitrogen atom in  $\text{NH}_3$ ?

	Molecular shape	Hybridization
a)	tetrahedral	$\text{sp}^3$
b)	trigonal planar	$\text{sp}^2$
c)	trigonal pyramidal	$\text{sp}^2$
d)	trigonal pyramidal	$\text{sp}^3$

6. Which particles can act as ligands in complex ion formation?

I.  $\text{Cl}^-$

II.  $\text{NH}_3$

III.  $\text{H}_2\text{O}$

a) I and II only

b) I and III only

c) II and III only

d) I, II and III

7. How many sigma ( $\sigma$ ) and pi ( $\pi$ ) bonds are present in the structure of HCN?

	$\sigma$	$\pi$
a)	1	3
b)	2	3
c)	2	2
d)	3	1

8. What is the final product formed when  $\text{CH}_3\text{CH}_2\text{OH}$  is refluxed with acidified potassium dichromate (VI)?

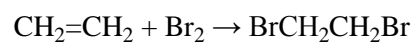
- a)  $\text{CH}_3\text{CHO}$
- b)  $\text{CH}_2=\text{CH}_2$
- c)  $\text{CH}_3\text{COOH}$
- d)  $\text{HCOOCH}_3$

9. Which of the following compounds exhibits three lines in the  $^1\text{H}$  NMR spectrum?

- I.  $\text{CH}_3\text{CH}_2\text{OCH}_3$
- II.  $(\text{CH}_3)_3\text{CCl}$
- III.  $\text{CH}_3\text{CH}_2\text{COOH}$

- a) I only
- b) II only
- c) I and III only
- d) I, II and III

10. What type of reaction does the equation below represent?



- a) substitution
- b) condensation
- c) reduction
- d) addition

## Organic & Inorganic Chemistry Sample Questions Key

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1. D
2. C
3. B
4. A
5. D
6. D
7. C
8. C
9. C
10. D