

# CARBONYL COMPOUNDS, ACIDS AND IT'S DERIVATIVES EXERCISE

1. Acetaldehyde on warming with Fehling's solution gives a red precipitate of :-

- (1) Elemental copper
- (2) Cuprous oxide
- (3) Cupric oxide
- (4) Mixture of all of the above

2. Acetone does not form :-

- (1) A phenylhydrazone with phenylhydrazine
- (2) A sodium bisulphite adduct with sodium bisulphite
- (3) A silver mirror with Tollen's reagent
- (4) An oxime with hydroxylamine

3.  $\text{CH}_3\text{CHO}$  and  $\text{CH}_3\text{COCH}_3$  can not be distinguished by :-

- (1) Fehling solution
- (2) Grignard reagent
- (3) Schiff's reagent
- (4) Tollen's reagent

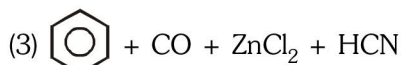
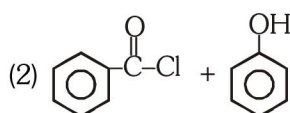
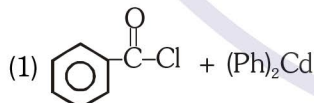
4. Acetone is obtained by the hydrolysis of the addition product of methyl magnesium iodide and :-

- (1)  $\text{HCHO}$
- (2)  $\text{CH}_3\text{CHO}$
- (3)  $\text{CH}_3\text{COCH}_3$
- (4)  $\text{CH}_3\text{-C}\equiv\text{N}$

5.  $\text{Ph}-\underset{\text{Cl}}{\overset{\text{Cl}}{\text{C}}}-\text{CH}_3 + \text{aq. KOH} \rightarrow \text{A} \xrightarrow[\text{H}^{\oplus}]{\text{KCN}} \text{B} ?$

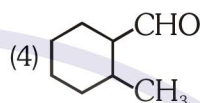
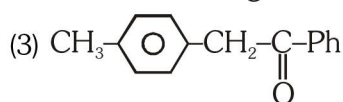
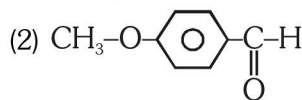
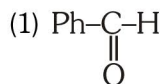
- (1) 50% d + 50% l
- (2) 80% d + 20% l
- (3) Meso compound
- (4) optically active

6.  can be obtained by :-



(4) None of the above

7. Which does not react with  $\text{NaHSO}_3$ .



8. Ketones can be prepared by :-

- (1) Rosenmund reduction
- (2) Etard reaction
- (3) Cannizzaro reaction
- (4) Friedel-Craft reaction

9. Carbonyl compounds are best purified by :-

- (1) Steam distillation
- (2) Hydrolysis of sodium bisulphite adducts
- (3) Fractional crytallisation
- (4) Sublimation

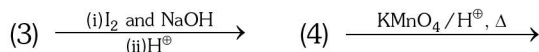
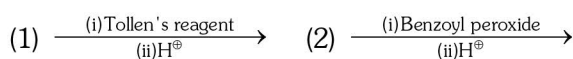
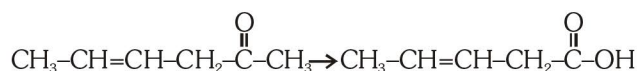
10. Carbonyl compounds readily undergo :-

- (1) Nucleophilic substitutions
- (2) Electrophilic addition reactions
- (3) Nucleophilic addition reactions
- (4) Free radical substitution reactions

11.  $\text{CH}_3-\overset{\text{O}}{\text{C}}-\text{CH}_3$  and  $\text{CH}_3-\overset{\text{O}}{\text{C}}-\text{H}$  are readily distinguished by their reaction with :-

- (1) Iodine and alkali
- (2) 2,4-dinitrophenylhydrazine
- (3) Tollen's reagent
- (4) All the above

12. Which is the most suitable reagent for the following conversion



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13. Formaldehyde reacts with conc. alkali to form :-  
 (1) A resinous mass  
 (2) Formic acid  
 (3) A mixture of methanol and sodium formate  
 (4) Methanol

14. Which of the following compounds does not give aldol condensation :-

- (1)  $\text{CH}_3\text{CHO}$                       (2)  $\text{CH}_3\text{CH}_2\text{CHO}$   
 (3)  $\text{HCHO}$                               (4)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

15. Cannizzaro reaction is given by :-

- (1) Aldehydes containing  $\alpha$ -hydrogen atoms  
 (2) Aldehydes as well as ketones containing  $\alpha$ -hydrogen atoms  
 (3) Aldehydes not containing  $\alpha$ -hydrogen atoms  
 (4) Aldehydes containing  $\beta$ -hydrogen atoms

16. Which of the following can be converted to  $\text{CH}_3\text{-CH=CH-CHO}$  :-

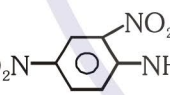

- (1) Acetone                              (2) Acetaldehyde  
 (3) Propanaldehyde                      (4) Formaldehyde

17. The product of reaction with primary amine and aldehyde is -

- (1)  $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$                       (2)  $\text{R}-\text{ONO}$   
 (3)  $\text{R}'-\text{CH}=\text{N}-\text{R}$                       (4)  $\text{R}-\text{NO}_2$

18. Brady's reagent is

- (1)  $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4$                       (2)  $\text{KMnO}_4/\text{NaIO}_4$

- (3)  (4) 

19. A compound with molecular formula  $\text{C}_3\text{H}_6\text{O}$ , not gives silver mirror with Tollen's reagent but forms oxime with hydroxyl amine. Compound will be -

- (1)  $\text{CH}_2=\text{CH}-\text{CH}_2-\text{OH}$   
 (2)  $\text{CH}_3\text{CH}_2\text{CHO}$   
 (3)  $\text{CH}_2=\text{CH}-\text{O}-\text{CH}_3$   
 (4)  $\text{CH}_3\text{COCH}_3$

20. Aldehyde and ketone are distinguished by reagent

- (1) Fehling solution                      (2)  $\text{H}_2\text{SO}_4$   
 (3)  $\text{NaHSO}_3$                               (4)  $\text{NH}_3$

21. Carbonyl group is converted into methylene group by -

- (1) Acidic reduction  
 (2) Raney Ni  
 (3) Basic hydrolysis  
 (4) Normal Hydrogenation

22. When acetaldol is treated with excess of acid then unsaturated product will be :-

- (1) Alcohol                              (2) Aldehyde  
 (3) Acid                                      (4) Alkyl halide

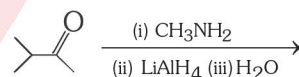
23. The reagent used for the separation of acetaldehyde from acetophenone is -

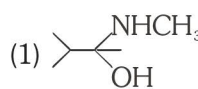
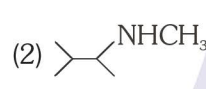
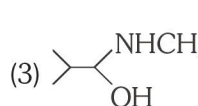
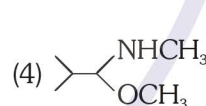
- (1)  $\text{NaHSO}_3$                               (2)  $\text{C}_6\text{H}_5\text{NHNH}_2$   
 (3)  $\text{NH}_2\text{OH}$                               (4)  $\text{NaOH} + \text{I}_2$

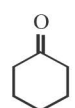
24. The most suitable reagent for the conversion of  $\text{RCH}_2\text{OH} \longrightarrow \text{RCHO}$

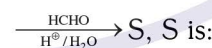
- (1)  $\text{KMnO}_4$   
 (2)  $\text{K}_2\text{Cr}_2\text{O}_7$   
 (3)  $\text{CrO}_3/\text{H}_2\text{SO}_4$   
 (4) PCC (Pyridinium chloro chromate)

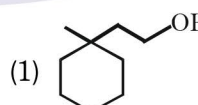

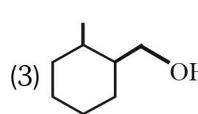
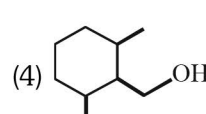
25. The major organic product formed from the following reaction is :-



- (1)                       (2)   
 (3)                       (4) 

26.  +  $\text{CH}_3\text{MgBr} \xrightarrow{\text{H}^+/\text{H}_2\text{O}} \text{P} \xrightarrow{\text{HBr}} \text{Q} \xrightarrow[\text{Ether}]{\text{Mg}} \text{R}$



- (1)                       (2)   
 (3)                       (4) 



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35. The correct increasing order of carbonyl compounds towards nucleophilic addition reaction.

- (1) Butanone < Propanone < Propanal < Ethanal
- (2) Butanone < Propanal < Propanone < Ethanal
- (3) Butanone < Ethanal < Propanone < Propanal
- (4) Butanone < Ethanal < Propanal < Propanone

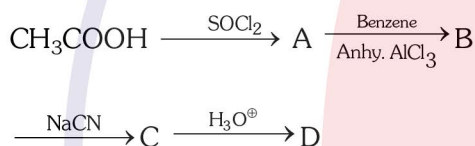
36. Which of the following carbonyl group give the positive fehling test ?

- (1) Aliphatic aldehydes      (2) Aromatic aldehydes
- (3) Ketones                      (4) Both (1) and (2)

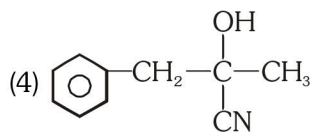
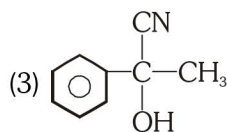
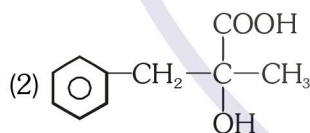
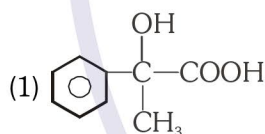
37. When propanoic acid is treated with aqueous sodium bicarbonate,  $\text{CO}_2$  is liberated. The C of  $\text{CO}_2$  comes from :-

- (1) methyl group
- (2) carboxylic acid group
- (3) methylene group
- (4) bicarbonate

38. In a set of reactions acetic acid yielded a product D



The structure of D would be -

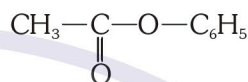


39. The compounds A and B in the reaction sequence



are given by the set respectively :-

- (1)  $\text{CH}_3\text{CO}-\text{O}-\text{COCH}_3$ ,  $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$
- (2)  $\text{CH}_3\text{CO}-\text{O}-\text{COCH}_3$ ,  $\text{C}_6\text{H}_5\text{OCOCH}_3$
- (3)  $\text{CH}_3\text{COCH}_3$ ,  $\text{C}_6\text{H}_5\text{OCOCH}_3$
- (4)  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$ ,



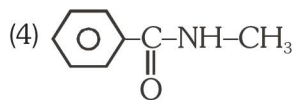
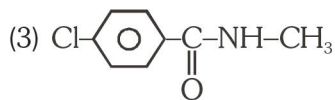
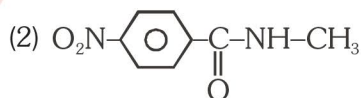
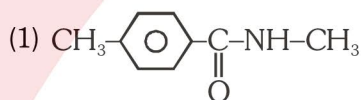
40.  $\text{CH}_3-\text{CH}_2-\text{COOH} \xrightarrow{\text{Red P/Cl}_2} \text{A} \xrightarrow[\text{KOH}]{\text{Alc.}} \text{B}$

structure of B is :-

- (1)  $\text{CH}_2=\text{CH}-\text{COOH}$
- (2)  $\text{CH}_3-\underset{\text{Cl}}{\text{CH}}-\text{COOH}$

- (3)  $\text{CH}_2-\underset{\text{Cl}}{\text{CH}}-\text{COOH}$
- (4)  $\text{CH}_3-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$

41. Which is most reactive towards hydrolysis.



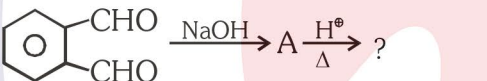
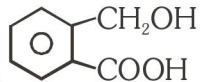
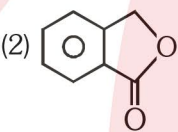


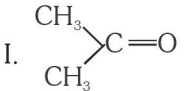
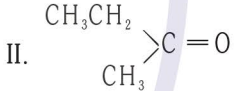
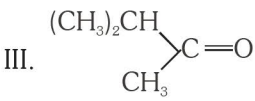
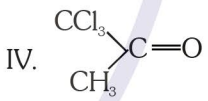
42. Which of the following reagents may be used to distinguish between phenol and benzoic acid ?

- (1) Victor-Mayer test
- (2) Neutral  $\text{FeCl}_3$
- (3) Aqueous  $\text{NaOH}$
- (4) Tollen's reagent

43. Acyl chlorides undergo :-

- (1) Nucleophilic addition reactions
- (2) Nucleophilic substitution reactions
- (3) Electrophilic substitution reactions
- (4) Electrophilic addition reactions

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44. The reaction of ethanol on acetic anhydride is an example of :-  
 (1) Nucleophilic addition  
 (2) Nucleophilic substitution  
 (3) Electrophilic addition  
 (4) Free radical substitution
45. The reduction of acetamide gives :-  
 (1)  $\text{CH}_3\text{CH}_2\text{NH}_2$   
 (2)  $(\text{CH}_3)_2\text{CHNH}_2$   
 (3)  $(\text{CH}_3)_3\text{CNH}_2$   
 (4)  $(\text{CH}_3\text{CH}_2)_2\text{NH}$
46. Which is used in preparation of aldehyde by rosenmund reduction  
 (1) Ester (2) Acid  
 (3) Acid halide (4) Alcohol
47.  $\text{CH}_3\text{-}\overset{\text{O}}{\parallel}{\text{C}}\text{-NH}_2 \xrightarrow[\Delta]{\text{P}_2\text{O}_5} ?$   
 (1)  $\text{CH}_3\text{COOH}$  (2)  $\text{CH}_3\text{-CN}$   
 (3)  $\text{CH}_3\text{-CH}_3$  (4)  $\text{CH}_3\text{-CHO}$
48.   
 (1)  (2)   
 (3)  (4) 
49. Arrange the following for reactivity towards nucleophilic addition reaction in decreasing order  
 I.  $\text{H}_2\text{C}=\text{O}$  II.  $\text{CH}_3\text{C}(\text{H})=\text{O}$   
 III.  $\text{CH}_3\text{C}(\text{CH}_3)=\text{O}$   
 (1) I > II > III (2) II > I > III  
 (3) III > II > I (4) None of these
50. Arrange the following for reactivity towards nucleophilic addition reaction in decreasing order  
 I.  $\text{ClCH}_2\text{CHO}$  II.  $\text{NO}_2\text{CH}_2\text{CHO}$   
 III.  $\text{CH}_3\text{CHO}$  IV.  $\text{CH}_3\text{CH}_2\text{CHO}$   
 (1) I > II > III > IV (2) II > I > III > IV  
 (3) IV > III > II > I (4) IV > I > II > III
51. Arrange the following for reactivity towards nucleophilic addition reaction in decreasing order  
 I.  $\text{CH}_3\text{CHO}$  II.  $\text{ClCH}_2\text{CHO}$   
 III.  $\text{HCCl}_2\text{CHO}$  IV.  $\text{CCl}_3\text{CHO}$   
 (1) I > II > III > IV (2) II > I > III > IV  
 (3) IV > III > II > I (4) IV > I > II > III
52. Arrange the following for reactivity towards nucleophilic addition reaction in decreasing order  
 I.  II.   
 III.  IV.   
 (1) I > II > III > IV (2) II > I > III > IV  
 (3) IV > III > II > I (4) IV > I > II > III

## ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	2	3	2	4	1	1	3	4	2	3	3	3	3	3	3
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	2	3	3	4	1	1	2	1	4	2	2	2	4	3	4
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	4	4	2	2	1	1	4	1	2	1	2	2	2	2	1
Que.	46	47	48	49	50	51	52								
Ans.	3	2	2	1	2	3	4								