

MUG Sample Question Paper Set 2

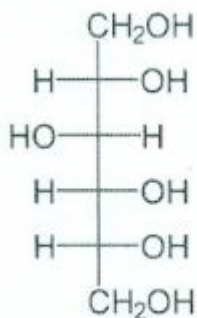
1. In the peptide, Ala-Ser-Lys-Gly; which amino acid has free amino group and which has free carboxylic group; accordingly:

a) Gly / Ala
b) Lys / Gly
c) Ala, Lys / Gly
d) Ala / Gly

2. Water solution of acid (formula HR) contains $0.2 \text{ mol } \bar{R}^-$ and 2 mol of undissociated HR molecules. Degree of dissociation is equal:

a) 0.091 b) 0.200 c) 0.100 d) 0.182

3. The following compound called sorbitol is obtained from glucose during:



a) reduction reaction
b) Hydrolysis reaction
c) Neutralization reaction
d) Oxidation reaction

4. Which of the following compounds will exhibit geometrical isomerism?

a) 1,1 - dichloroprop - 1-ene
b) 2,3 - dichlorobutane
c) 2 - methylbut - 2 - ene

d) 2,3 - dichlorobut - 2 - ene

5. In which of the following species would hydrogen bonding occur?

a) PH_3 b) H_2S c) CH_4 d) $\text{CH}_3\text{CH}_2\text{OH}$

6. The following is a list of selected standard reduction potentials. Which of the following species is the best oxidizing agent?



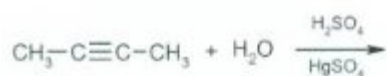
a) $\text{Cd}_{(s)}$ b) $\text{Ni}^{2+}_{(aq)}$ c) $\text{Zn}_{(s)}$ d) $\text{Zn}^{2+}_{(aq)}$

7. Choose the group in which there are only acidic oxides:

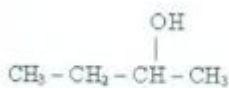
- a) NO, NO₂, N₂O₅ b) CO₂, Cr₂O₃, PbO c) CrO, CrO₃, Cr₂O₃

d) CrO₃, NO₂, SO₂

8. The final product of the reaction shown below is:



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



c) $\text{CH}_3\text{-CH(CH}_3\text{)-C(=O)-H}$

d) $\text{CH}_3\text{-CH(OH)-CH(OH)-CH}_3$

9. The rate expression for a chemical reaction is: Rate = K [A] [B]². If the concentration of A & B are both doubled; the rate would increase by a factor of:

- a) 2 **b) 8** c) 16 d) 4

10. Count all σ n bonds in the compound: CH≡C-CHO

- a) 4 σ, 2 n b) 5 σ, 2 n c) 5 σ, 1 n **d) 5 σ, 3 n**

11. Secondary alcohol is:

a) 3-methyl-2-butanol b) 2-methyl-2-pentanol c) 3-methyl-3-hexanol

d) 3-methyl-1-butanol

12. 5 cm³ 40% NaOH (density 1.40 g/cm³) was diluted to volume of 200 cm³. Concentration of the resulting solution was:

13. The number of the subatomic particles for X is equal 86; in which 32 are neutrons. Define the position of X in the Periodic table:

- a) group 9, period 4
- b) group 16, period 3
- c) group 18, period 5**
- d) group 4, period 4

14. Amonia is a(n):

- a) base according to Bronsted-Lowry and to Lewis
- b) base according to Bronsted-Lowry
- c) acid according to Bronsted-Lowry

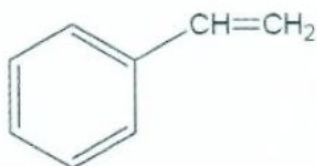
d) base according to Lewis

15. Carbon solid reacts with oxygen gas to form carbon monoxide gas. How addition of carbon solid influence the equilibrium?



- a) No effect
- b) Shift left to produce more oxygen
- c) shift right to use added carbon**
- d) Shift right as there are more molecules.

16. What is produced when following molecule is polymerized?



- a) Teflon
- b) polystyrene**
- c) polyvinyl chloride
- d) saran

17. Calculate the heat (ΔH^0) of a reaction for the combustion of n-butane:

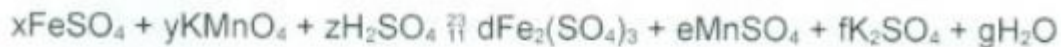


Enthalpies of formation, ΔH_f^0 (kcal/mole) at 298°C:



- a) -132 b) -192 **c) -686** d) -310

18. In the presented reaction equation the coefficients are as follows:



	x	y	z	d	e	f	g
a)	5	2	8	5	2	1	4
b)	5	1	8	5	3	2	1
c)	10	2	8	5	2	1	8
d)	10	2	4	5	2	1	8

- a) d b) b c) a **d) c**

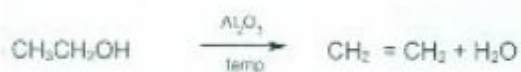
19. What is the pH of 0.010 M NaOH solution?

- a) 14 b) 10 c) 2 **d) 12**

20. How long would a constant current of 4.5 amperes be required to flow in order to plate out 15 g of chromium from chromium (III) sulfate solution?

- a) 268 hours **b) 5.15 hours** c) 309 hours d) 23.2 hours

21. Which one of the following reactions does not occur?



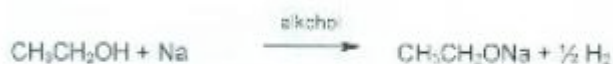
a)



b)

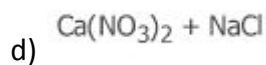
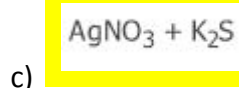
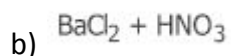
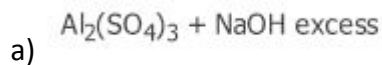


c)

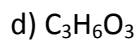
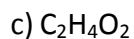
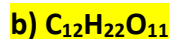
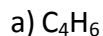


d)

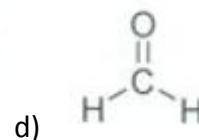
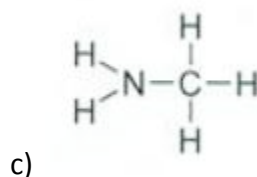
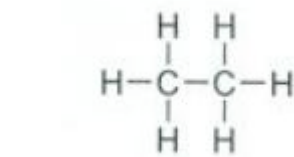
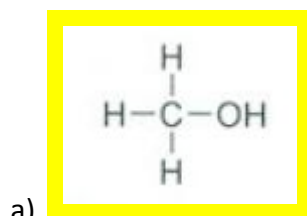
22. Insoluble precipitates will be produced in which of the following reactions:



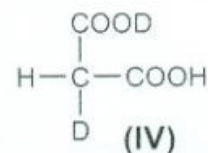
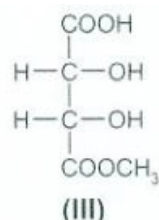
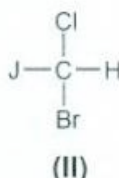
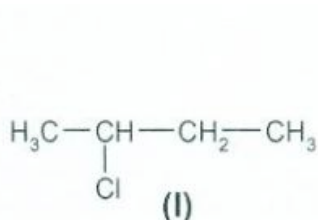
23. Of the following the only empirical formula is:



24. Choose the substance with the highest boiling point:



25. Which of the molecules can exist as optical isomers?



a) II

b) III

c) IV

d) I

26. Sodium-25 was to be used in an experiment; but it took 3 minutes to get the sodium from the reactor to the laboratory. If 5 mg of sodium-25 was removed from the reactor; how many mg of sodium-25 were placed in the reaction vessel 3 min. later if the half-time of sodium-25 is 60s?

- a) **0.625 mg** b) 0.06 mg c) 2.65 mg d) 13.25 mg

27. Tollens test enables distinction of:

- a) butanal from propanal
b) butene from butane
c) butanone from propanone

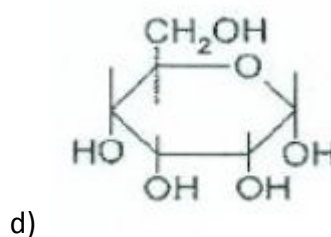
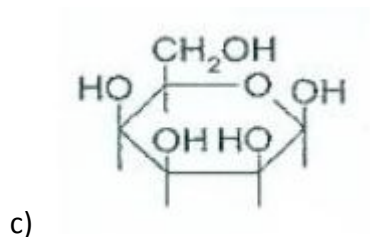
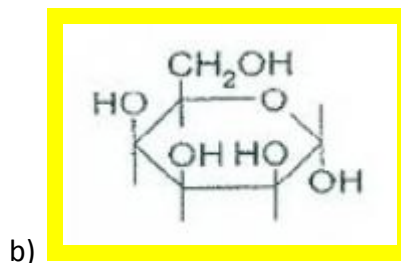
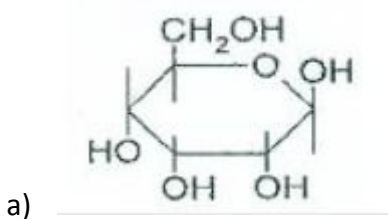
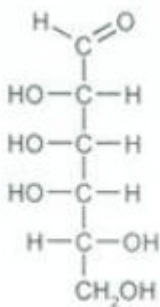
d) butanal from butanone

28. The process that is used to convert unsaturated vegetable oils, which are lipids at room temperature, to saturated fats, which are solids at room temperature:

- I. It is called hydrogenation reaction
II. Needs catalyst (Pt, Ni or some other metal)
III. A structure called micelle is formed
IV. Digestive enzymes called lipases are involved

- a) II and III
b) II and IV
c) I and IV
d) I and II

29. The fisher projection for aldohexose named D-talose is shown below. Indicate Haworth formula for β -D-talopyranose.



30. What is the molar mass of the alcohol ROH, if in the reaction 23g of alcohol will liberate 1.5×10^{23} hydrogen molecules? ($1.5 \times (10)$ raised to the power 23)



a) 46 g/mol

b) 92 g/mol

c) 23 g/mol

d) 69 g/mol

