

Marks Scored:

KATHMANDU UNIVERSITY  
End Semester Examination (C)  
January, 2018

Level : B.Sc./B. Pharm.

Year : II

Exam Roll No. :

Time: 30 mins.

Course : CHEM 203

Semester : II

F. M. : 20

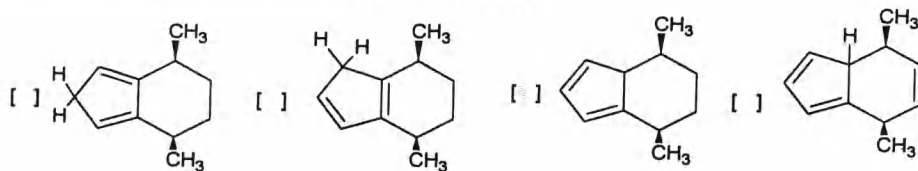
Registration No.:

Date JAN. 09, 2018

SECTION "A"

[20 Q. × 1 = 20 marks)

1. What is the product for the given reaction?



2. Which of the following statements is NOT true regarding fatty acids?

Fatty acids dissolve in nonpolar solvents.

Triglycerides are esters of fatty acids.

Most naturally occurring fatty acids have trans double bonds.

Fatty acids are biosynthesized from acetate.

3. CO<sub>2</sub> on reaction with Grignard reagent gives

Primary alcohol  Secondary alcohol  Propanal  Carboxylic acid

4. Which of the following is not true?

[4n+2] thermalcycloaddition takes place on antra, antra mode

[4n+2] photochemicalcycloaddition takes place on antra, supra mode

[4n] thermalcycloaddition takes place on supra, supra mode

[4n] photochemicalcycloaddition takes place on antra, antra mode

5. Which of the following compounds does NOT undergo mutarotation?

glucose

sucrose

ribose

fructose

6. The position of -CH<sub>3</sub> groups in the given steroid are .....

18,19,20

18,19,21

17,19,21

18,20,21

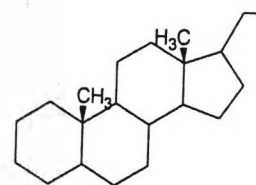
7. Electrophilic substitution in Pyridine is favorable at.....position

2

3

4

2 & 4







8. In 1,3,5, hexatriene, the excited state LUMO is present at the energy level.....

$\psi_2$

$\psi_3$

$\psi_4$

$\psi_5$

9. Which compound is most basic?        

10. Acetoacetic ester is .....

alpha-hydroxyaldehyde

beta-keto ester

beta-keto acid

alpha-ketoaldehyde

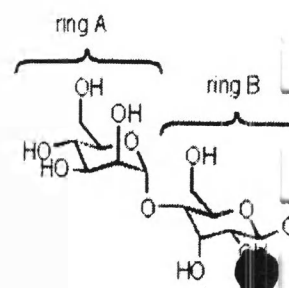
11. Which of the following statements is not true about Aromatic compounds?  
 They are cyclic  They may be ionic  
 They have  $(2n+4)$  pi- electrons  They are unsaturated compounds

12. What reagent is used in the Edman degradation for N-terminal group analysis of peptides?

- phenyl isothiocyanate  di-t-butyl dicarbonate  
 dicyclohexylcarbodiimide  benzyl chloroformate

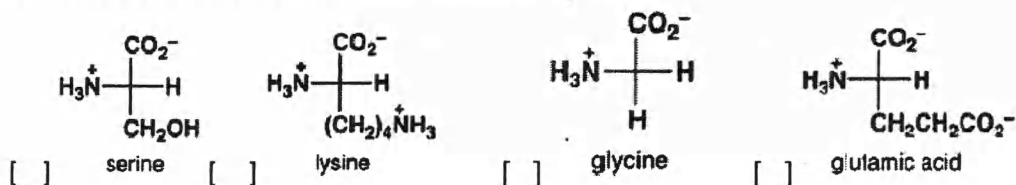
13. Which statements are correct about the following disaccharide?

- Ring A is an acetal in the  $\alpha$  configuration; ring B is a hemiacetal in the  $\beta$  configuration.  
 Ring A is an acetal in the  $\beta$  configuration; ring B is a hemiacetal in the  $\alpha$  configuration.  
 Ring A is a hemiacetal in the  $\alpha$  configuration; ring B is an acetal in the  $\beta$  configuration.  
 Ring A is a hemiacetal in the  $\beta$  configuration; ring B is an acetal in the  $\alpha$  configuration.



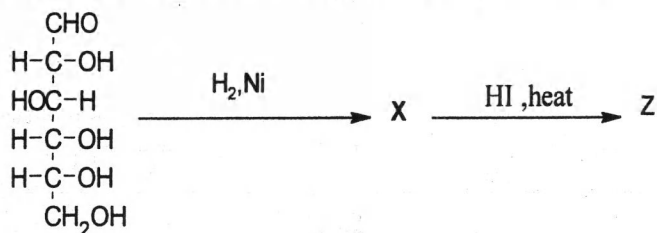
14. Which of the following statements regarding the reducing ability of a sugar is wrong?  
 The aldehyde group of a saccharide is responsible for its reducing properties.  
 Ketoses are not reducing sugars because they are not aldehydes.  
 D-Glucose is predominantly in a cyclic hemiacetal form but it is a reducing sugar through the acyclic form with which the hemiacetal is in equilibrium.  
 A methyl glucoside is not a reducing sugar.

15. Which amino acid has the lowest isoelectric point?



Fill in the blanks.

16. Dicyclohexylcarbodiimide(DDC)has a the molecular formula as.....  
 17. The transfer constant in the polymerization process is expressed as.....  
 18. Write down the product/s  $\text{BrCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{Br} + \text{Na}_2\text{S} \longrightarrow$  .....  
 19. Benzaldehyde on cross aldol condensation with  $\text{CH}_3\text{COCH}_3$  produces.....  
 (draw structure).  
 20. What is Z in the following reaction?( draw structure)



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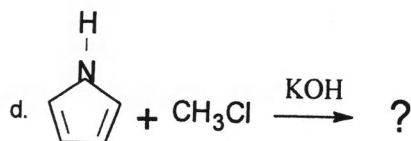
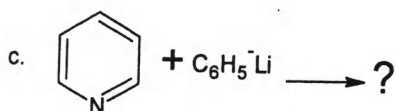
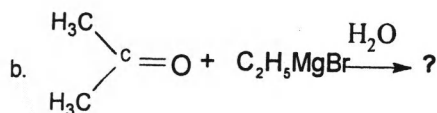
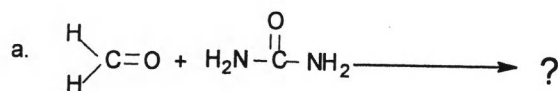
Level : B.Sc./B. Pharm.  
Year : II  
Time : 2 hrs. 30 mins.

Course : CHEM 203  
Semester : II  
F. M. : 55

SECTION "B"

Attempt ALL questions.

1. Give the mechanism for the following reactions. [2 × 6 = 12]
  - a. Aldol condensation
  - b. Free radical polymerization of Styrene
  - c. Malonic ester synthesis .
  - d. Wittig reaction
  - e. Butylmagnesiumchloride with ethylethanoate followed by hydrolysis.
  - f. [2+2] cycloaddition reaction on thermal condition.
2. Give the chemical reactions involved in the following process. [1.5 × 6 = 9]
  - a. Reaction of Maltose with Phenylhydrazine.
  - b. Synthesis of aminoacids by phthalimidomalonic ester method.
  - c. Polymerization between Phenol and formaldehyde.
  - d. Reaction of 1,4 dibromobutane with Sodiunsulphide on heating
  - e. Conversion of an aldopentose to alohexose.
  - f. Photochemical cyclization of trans,cis, cis-2,4,6-Octatriene.
3. Explain the following . [2 × 4=8]
  - a. Cleanig action of soap
  - b. Electrophoresis
  - c. Steroids
  - d. Space network polymers
4. Give the product/s of the following reactions. [1.5 × 4 = 6]



5. Explain the following statements. [2 × 5=10]
- a. [1,3] carbon shifts occurs with inversion of configuration
  - b. Nucleophilic substitution in Pyridine is favorable at 2&4-position.
  - c. Sucrose is non reducing sugar.
  - d. [4n+2]cycloaddition occurs in supra,antra or antra,supra mode in photochemical process.
  - e. X-ray diffraction of proteins indicates the the regular repetition of certain structural units in the distances of  $7.0 \text{ \AA}$ ,  $1.5 \text{ \AA}$  and  $5.1 \text{ \AA}$
6. Write short notes: [2.5 × 4=10]
- a. Co-ordination polymerization
  - b. Terninal residue analysis of proteins
  - c. Structure of cyclodextrin
  - d. Synthesis of fatty acid.

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Level : B.E.

Year : II

Exam Roll No. :

Time: 30 mins.

Course : CHEG212

Semester : II

F. M. : 10

Registration No.:

Date JAN . 0 9 . 2018

SECTION "A"

[20 Q.  $\times$ 0.5 = 10 marks)

Attempt *ALL* the questions.

1. Which of the following is not a primary dimension?  
a) Mass                      b) Length                      c) Temperature                      d) Surface tension
2. The ratio of pressure force to inertial force is called  
a) Weber number      b) Reynolds number      c) Euler number                      d) Mach Number
3. Shear-thickening fluid is  
a) Pseudo-plastic      b) Dilatant                      c) Bingham Plastic                      d) Newtonian
4. Which of the following is variable area meter?  
a) Rotameter                      b) Venturimeter                      c) Orifice meter                      d) Pitot tube
5. The valve used for prevention of back flow is  
a) Glove valve                      b) Ball valve                      c) Check valve                      d) Safety relief valve
6. An ideal fluid is  
a) Frictionless & incompressible                      b) One which obeys Newton's law of viscosity  
c) Highly viscous                      d) Non-uniform
7. Drag co-efficient for motion of spherical particles in a stationary fluid in the Stoke's law range is  
a) 24/Reynolds Number                      b) 16/ Reynolds Number  
c) 32/ Reynolds Number                      d) 48/ Reynolds Number
8. Differential manometer measures the  
a) absolute pressure                      b) gauge pressure  
c) pressure difference                      d) pressure gradient
9. Terminal velocity is  
a) constant velocity with no acceleration  
b) a fluctuating velocity  
c) attained after moving one-half of total distance  
d) maximum velocity during the flow
10. The Reynolds number for an ideal fluid flow is  
a) 4                      b) 2100-4000                      c) 4000                      d) Infinity

11. All varieties of fuel oil and lubes is transported by  
 a) Screw pump      b) Lobe pump      c) Vane pump      d) Gear pump
12. Propellers are  
 a) axial flow mixers      b) low speed impeller  
 b) used for mixing liquids of high viscosity d) radial flow mixers
13. Net positive suction head (NPSH) of a centrifugal pump must be  
 a) greater than the vapour pressure of the liquid  
 b) less than the vapour pressure of the liquid  
 c) equal to the vapour pressure of the liquid  
 d) less than barometric pressure
14. Bernoulli's equation is not applicable, when the flow is  
 a) irrotational      b) incompressible  
 c) viscous      d) irrotational, incompressible and viscous
15. Each term of the Bernoulli's equation written in the form represents the total energy per unit  
 a) mass      b) volume      c) specific weight      d) density
16. Pressure drop in a packed bed for laminar flow is given by the \_\_\_\_\_ equation.  
 a) Kozney-Karman      b) Blake-Plummer  
 c) Leva's      d) Fanning friction factor
17. The equivalent diameter for pressure drop calculation for a fluid flowing through a rectangular cross-section channels having sides 'x' & 'y' is given by  
 a)  $2xy/(x+y)$       b)  $xy/(x+y)$       c)  $(x+y)/2xy$       d)  $(x+y)/xy$
18. When the pipe Reynold's number is 6000, the flow is generally  
 a) viscous      b) laminar      c) turbulent      d) transition
19. Bernoulli's equation does not apply to the functioning of a/an  
 a) Venturimeter      b) Orificemeter      c) Pitot tube      d) Ultrasonic meter
20. Priming is needed in a \_\_\_\_\_ pump.  
 a) reciprocating      b) gear      c) centrifugal      d) diaphragm