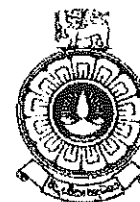


THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF BASIC SCIENCES



BACHELOR OF PHARMACY HONOURS- LEVEL 04 - 2020/21
BSU4340- PHARMACEUTICAL CHEMISTRY III
NBT 02

DATE: 05th January 2022

DURATION: 1.5 HOURS

TIME: 11.00 p.m. – 12.30 p.m.

REGISTRATION NO:

1. This question paper consists of 11 pages with 20 Multiple Choice Questions (Part A) and 04 Short Answer Questions (Part B).
2. Please fill the address sheet. (See last page)

IMPORTANT INSTRUCTIONS TO CANDIDATES

- Write your Registration Number in the space provided.
- Answer **ALL** questions.
- **Multiple Choice Questions (Part A):** Indicate answers in the answer sheet provided by placing a cross (X) in **INK** in the relevant cage.
- Answers in pencil will **NOT** be marked.
- **Short Answer Questions/ (Part B):** Write answers within the space provided.
- Do not remove any page/part of this question paper from the examination hall.
- Mobile phones and the electronic equipment are **NOT** allowed. Leave them outside.

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REGISTRATION NO:

ANSWER SHEET FOR PART A

Q. No.	(a)	(b)	(c)	(d)
1.1				
1.2				
1.3				
1.4				
1.5				
1.6				
1.7				
1.8				
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1.20				



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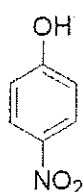
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Part A – Multiple Choice Questions

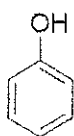
(20 marks)

1. Choose the most suitable answer and indicate with a 'X' in the answer sheet provided.

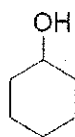
1.1 Rank the following in the order of increasing acidity.



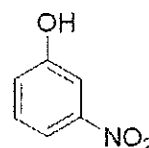
A



B



C



D

- a) C<B<D<A b) B<C<D<A c) A<B<C<D d) B<A<D<C

1.2 Melting points of phenolic compounds are relatively high for aryl compounds because of:

- a) Ionic bonding b) Hydrogen bonding c) Metallic bonding d) Covalent bonding

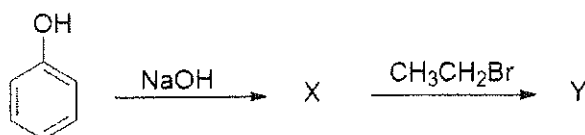
1.3 Which of the following compounds will be most easily attacked by an electrophile?

- a) Benzene b) Chlorobenzene c) Phenol d) *p*-nitrophenol

1.4 Ortho-nitrophenol is less soluble in water than *p*- and *m*- nitrophenols because

- a) *o*-nitrophenol is more volatile than those of *m*- and *p*-isomers
b) *o*-nitrophenol shows intermolecular H-bonding
c) melting point of *o*-nitrophenol is lower than those of *m*- and *p*-isomers
d) *o*-nitrophenol shows intramolecular H-bonding

1.5 Identify the final product (Y: major) of the reaction sequence given below.



- a) Sodium bromide b) Sodium phenoxide c) Benzoic acid d) Ethyl phenyl ether



1.6 Benzoquinone is prepared by reaction of phenol with
a) $\text{Na}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4$ b) NaOH c) $\text{CHCl}_3, \text{NaOH}$ d) $\text{NaNO}_2, \text{HCl}$

1.7 When phenol is treated with bromine in CH_2Cl_2 , it gives

- a) *m*-bromophenol b) *p*-bromophenol
b) 2,4-dibromophenol c) 2,4,6-tribromophenol

1.8 Which one of the following reagent/s will NOT react with phenol?

- a) Br_2 water b) NaOH c) NaHCO_3 d) Conc. $\text{HNO}_3/\text{H}_2\text{SO}_4$

1.9 Which of the following arylamines will not form a diazonium salt on reaction with sodium nitrite and HCl ?

- a) *N,N*-dimethylaniline b) 3-chloroaniline
b) *p*-aminoacetophenone d) *m*-ethylaniline

1.10 What is the most suitable temperature for the diazotization reaction to take place?

- a) 100°C b) 0°C c) 25°C d) 60°C

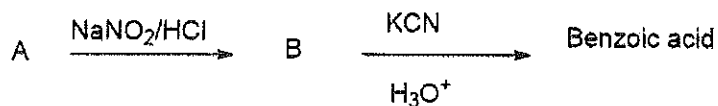
1.11 When benzenediazonium chloride is treated with H_3PO_2 acid, the product obtained is

- a) phenol b) chlorobenzene
c) benzene d) aniline

1.12 What is the color of the product of the reaction between benzenediazonium chloride and phenol?

- a) Yellow b) Colorless c) Red d) Orange

1.13 Which of the following is compound A for the following reaction sequence to produce benzoic acid?



- a) phenol b) Benzene c) Toluene d) Aniline

1.14 The 'N' atom in pyridine is

- a) sp^2 hybridized b) sp^3 hybridized
b) sp hybridized d) None of these

1.15 Which one of the following statements is **INCORRECT**?

- a) The reactivity of pyridine resembles that of a highly deactivated benzene.
b) Pyridine N-oxides are reactive towards both electrophilic and nucleophilic substitutions.
c) Pyridine undergoes electrophilic aromatic substitution easily.
d) Pyridine readily undergoes nucleophilic substitution reactions.



1.16 Which element is present as hetero atom in pyridine?

- a) Sulphur
- b) Nitrogen
- c) Oxygen
- d) Sulphur and nitrogen

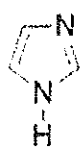
1.17 At which position of pyridine electrophilic substitution reaction is most preferred?

- a) First and third
- b) Second
- c) Second and Forth
- d) Third

1.18 Which of the following compound is most resonance stabilized?

- a) Furan
- b) Thiophene
- c) Pyrrole
- d) Pyridine

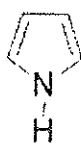
1.19 Which one of the following compounds is most basic?



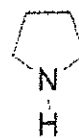
a)



b)

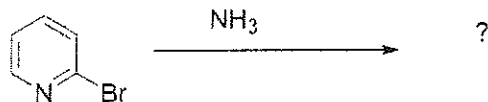


c)



d)

1.20 What will be the product of the following reaction?



- a) 2-aminopyridine
- b) 3-aminopyridine
- c) 3,5-diaminopyridine
- d) 2,5-diaminopyridine

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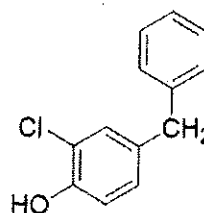
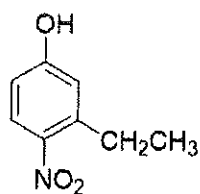
Part B –Short Answer Questions

(80 marks)

Write answers in the space provided.

1. a) Explain why *p*-cyanophenol is slightly more acidic than *m*-cyanophenol. (06 marks)

b) Provide the IUPAC Name of the following aromatic compound. (08 marks)



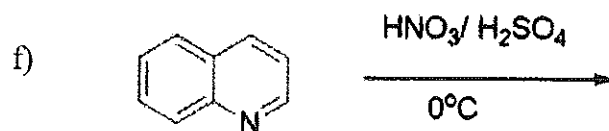
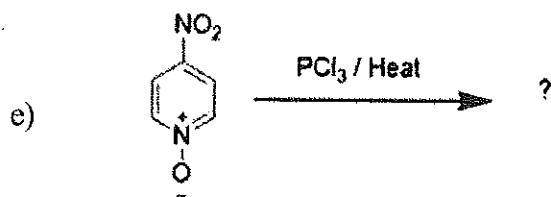
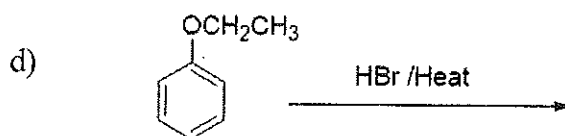
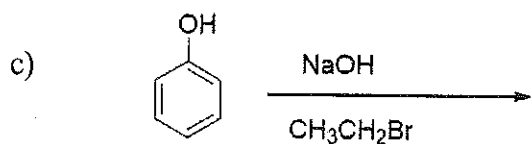
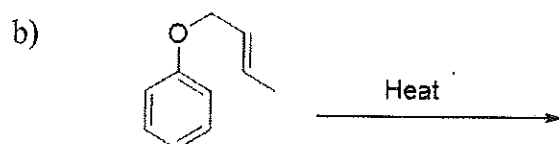
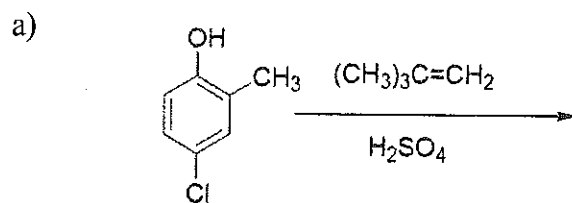
c) Which of the following isomer is more volatile: *O*-nitrophenol or *P*-nitrophenol?
Explain your answer. (06 marks)

2. a) Pyrrole is more reactive than benzene towards electrophilic substitution reactions.
Explain. (10 marks)

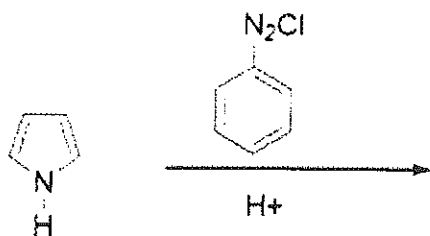
b) Explain why pyrrole is a weaker base than pyridine? (10 marks)



3. Give the structures of the major products of the following reactions (a-g). (20 marks)



g)



4. Giving necessary reagents and conditions, show how you would carry out the following multistep transformations. (20 marks)

