**BACHELOR OF PHARMACY HONOURS - LEVEL 3 - 2023/24**
**BSU3341- PHARMACEUTICAL CHEMISTRY II**
**FINAL EXAMINATION**

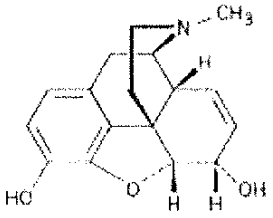
**INDEX NO:** .....

**Part B –Answer all questions**

***(80 marks)***

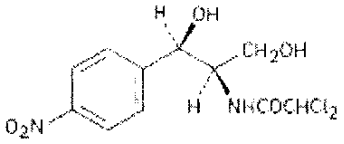
1.

i) How many chiral centers does the morphine have? In theory, how many stereoisomers of morphine are possible. (02 marks)




Morphine

ii) Chloramphenicol, a powerful antibiotic which is active against a broad spectrum of bacterial infections.




Chloramphenicol

a) Assign configuration (as R or S) to each stereocenter of Chloramphenicol. (04 marks)
b) Draw the structure of an enantimore of Chloramphenicol. (02 marks)
c) Draw the structure of diastereoisomer of Chloramphenicol. (02 marks)

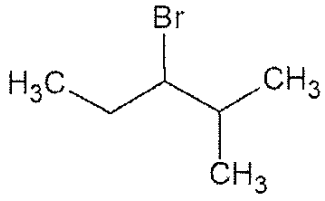
2.

i) Draw Newman projection diagrams to show staggered and eclipsed conformations of 2-bromobutane when the C2-C3 bond is rotated through $360^0$. Indicate the most stable conformation(s). (05 marks)

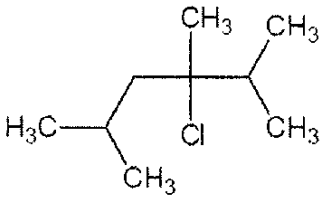
ii) Draw chair conformations of cis-1,2-dimethylcyclohexane and trans- 1,2-dimethylcyclohexane. Indicate which chair conformation is the most stable in each cases (provide reasons). (05 marks)

3)

i) What products would you expect from elimination reactions of the following alkyl halides? Which product will be the major product in each case? (Ignore the double-bond stereochemistry of the products). (10 marks)




a)

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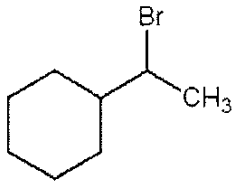
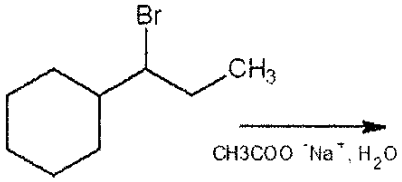
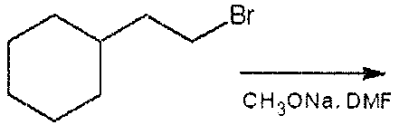



c)

ii) Draw the structures of the products of following substitution reactions. Providing reasons, predict whether each of the reactions is likely to be $S_N1$ or $S_N2$. (06 marks)




a)



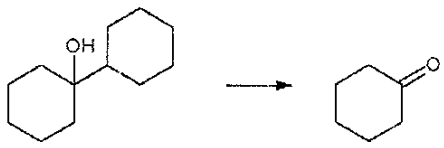

b)

iii) Explain the effect of solvents polarity in $S_N1$ reactions. (04 marks)

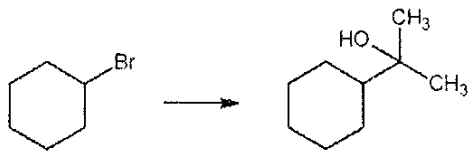
4.

i) Provide the structures of appropriate starting materials to synthesize 4-methylpent-3-en-2-one via an aldol condensation. Could it give a high yield? Briefly explain your answer. (08 marks)

ii) Giving necessary reagents and conditions, show how you would carry out the following multistep transformations. (12 marks)



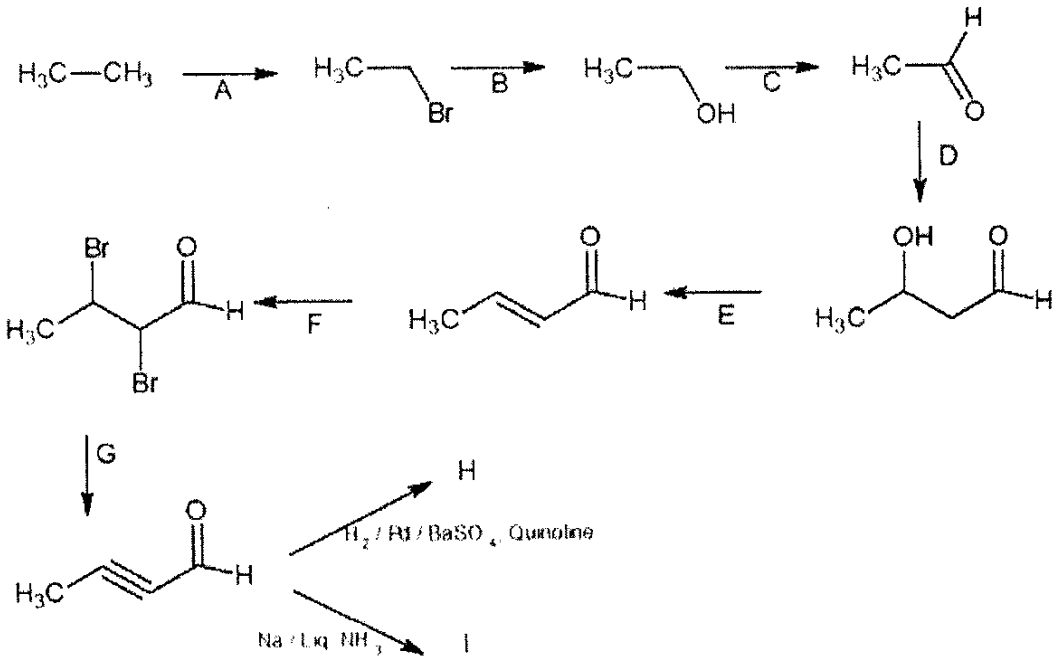

a)




b)

5.

i) Complete the following reaction sequence by providing structures of missing products, reagents, and conditions (**A-I**). (12 marks)




ii) How would you carry out the following transformation? (08 marks)

**END**