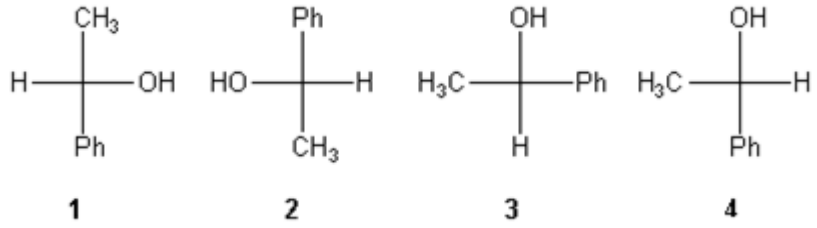
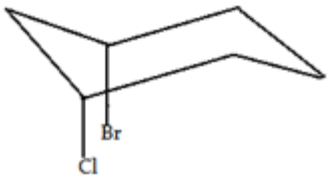
Name: Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

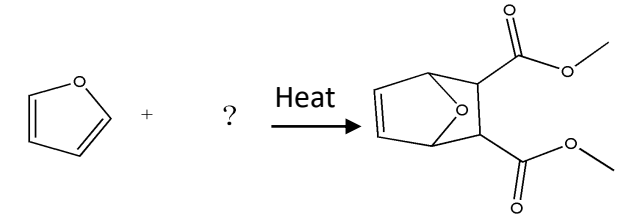
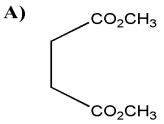
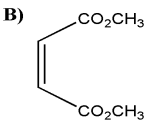
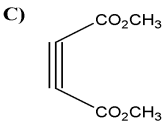
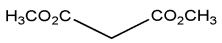
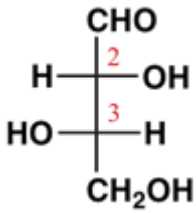
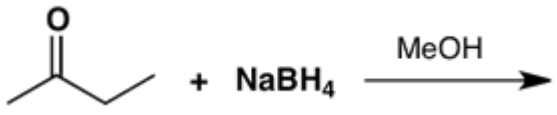
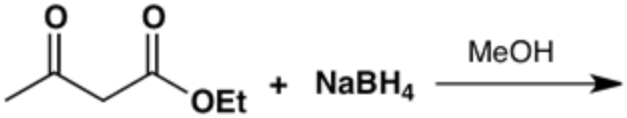
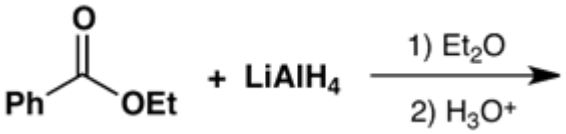
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

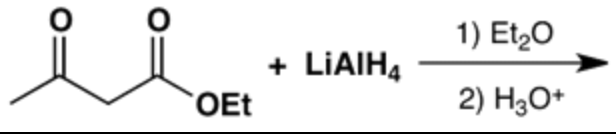
Course: Pharmaceutical Organic Chemistry III — **Semester: IV**
Program: B. Pharm. — **Time: 03 hrs.**
Course Code: BP401T — **Max. Marks: 75**
Instructions: All the sections are compulsory.

SECTION A

1. Each Question will carry 1 Marks
2. Instruction: Select the correct answer(s), Answers all the 20 questions.

S. No.	Questions	CO
Q 1	**Compounds which have different arrangements of atoms in space while having same atoms bonded to each other are said to have** a) position isomerism b) functional group isomerism c) chain isomerism d) stereoisomerism	**CO2**
Q 2	**Hinsberg synthesis is used to prepare** a) Furan b) Thiophen c) Pyrrole d) None of these	**CO1**
Q 3	**Which of the following Fischer projections is different from the other three?**  1 2 3 4	**CO2**
Q 4	**What is the relationship between the two groups in the following molecules?**  a) They are equatorial to one another b) They are axial to one another c) They are cis to one another d) They are trans to one another	**CO2**
Q 5	**Which of the following is an alkane which can exhibit optical activity?** a) Neopentane b) Isopentane c) 3–Methylpentane d) 3–Methylhexane	**CO1**

Q 6	**Ranitidine drug contain** a) Furan ring b) Pyrrole ring c) Pyrazole ring d) Quinoline ring	**CO3**
Q 7	**Find out the reactant of the following reaction**  A)  B)  C)  D) 	**CO1**
Q 8	**Which of the following is not true about the five membered rings?** a) Five membered rings are more stable than 4 membered rings b) Five membered rings are more stable than 6 membered rings c) Five membered rings are more stable than 7 membered rings d) Five membered rings are more stable than 8 membered rings	**CO1**
Q 9	**Which is the correct assignment of chirality at C2 and C3 of the following molecule?**  a) 2S,3S b) 2R,3R c) 2S,3R d) 2R,3S	**CO2**
Q 10	**Which of the following reactions gives no chiral product?** a)  b)  c) 	**CO2**

	d) 	
Q 11	**Two sp2 hybridized electron pairs available in which of the following heteroaromatic compound?** a) Pyrazole b) Pyrrole c) Pyridine d) Oxazole	**CO1**
Q 12	**Which of the following can make difference in optical isomers?** a) heat b) temperature c) polarized light d) pressure	**CO2**
Q 13	**Oxazole compound is showing _____ activity** a) Antifungal b) Antibiotic c) Pyridine d) Oxazole	**CO3**
Q 14	**Which of the following groups has the highest priority according to the Cahn-Ingold-Prelog sequence rules?** a) CH_3 b) CH_2Cl c) CH_2OH d) CHO	**CO2**
Q 15	**Robinson-Gabriel synthesis is used to prepare** a) Thiazole b) Quinoline c) Oxazole d) Furan	**CO1**
Q 16	**Cis and Trans isomers are the forms of which isomerism** a) Optical isomers b) Geometrical isomers c) structural isomers d) Chain isomers	**CO2**
Q 17	**Why pyridine is more basic than pyrrole?** a) In pyridine, lone pair of electrons on nitrogen atom are not participating in resonance. b) In pyrrole, lone pair of electrons on nitrogen atom are not participating in resonance. c) Pyrrole is having lone pair of electrons perpendicular to the plane of the ring structure. d) both (a) and (c)	**CO1**
Q 18	**What is the molecular formula for the alkane of smallest molecular weight which possesses a stereogenic center?** a) C_4H_{10} b) C_5H_{12} c) C_6H_{14} d) C_7H_{16}	**CO2**
Q 19	**$LiAlH_4$ is _____ agent.** a) Reducing agent b) Pyrophoric agent c) Oxidizing agent d) both (a) and (b)	**CO3**

Q 20	**What is the product when thiophene reacts with Br_2 in benzene?** a) 2-bromothiophene b) 3-bromothiophene c) 2,5-dibromothiophene d) 3,4-dibromothiophene	**CO1**

SECTION B

1. Question will carry 10 marks.
2. Instruction: Long Answer type questions (Any two of three)

Q 1	**A)** What is Atropisomerism? **B)** What are the factors influence Atropisomerism? **C)** What are the conditions required for biphenyls to be enantiomeric? (1+4+5)	**CO2**
Q 2	**A)** Write a short note on Paal-Knorr synthesis to prepare pyrrole compound. **B)** "Pyrrole undergoes electrophilic substitution at C-2 position" – Briefly discuss the reason with an example. **C)** Write down the pharmaceutical use of pyrrole. **(4+4+2)**	**CO1**
Q 3	**A)** Describe Skraup quinoline synthesis. **B)** "Nucleophilic substitution reaction is mostly favored at C-4 position of 4,7-dichloro quinoline ring"- Explain it with an example. **C)** Write down the different reduction reaction process of quinoline ring. **(5+2.5+2.5)**	**CO1**

SECTION C

1. Each question will carry 5 marks. Answer any seven questions out of nine questions
2. Instruction: Short Answers type questions

			10
Q 1		**(A)** What do you mean by stereoisomer? **(B)** Explain the difference between configurations and conformations with proper examples. **(1+4)**	**CO2**
Q 2		Why C-4 position in pyrazole is mostly favored for electrophilic substitution instead of C-3 and C-5 positions? Explain the reason briefly with an example.	**CO1**
Q 3		**A)** Draw all possible conformational structures of cyclohexane. **B)** Why chair conformation of cyclohexane is more stable than other conformations? **(2+3)**	**CO2**
Q 4		**A)** Why pyridine is less basic than aliphatic amine? **B)** How Diels-Alder reaction can be utilized to prepare pyridine from oxazole? **(2+3)**	**CO3**
Q 5		**(A)** Why pyrazole is having weak acid as well as weak basic chemical property? **(B)** Explain the mechanism of synthesis to prepare pyrazole from pyrimidine moiety. **(2+3)**	**CO1**
Q 6		**(A)** Define asymmetric synthesis? **(B)** Write down the difference between chiral pool synthesis and chiral axillary synthesis with examples. **(1+4)**	**CO2**

Q 7		**(A)** How imidazole ring can show its catalytic activity with an ester to form an acid group? **(B)** Why oxazole is less reactive compare to imidazole? **(3+2)**	**CO1**
Q 8		**(A)** What do you mean by racemic compound? **(B)** Write a short note on resolution of racemic mixture. **(1+4)**	**CO3**
Q 9		**(A)** What are the chemicals required for Birch reduction? **(B)** How benzene ring can be converted to cyclohexadienes? **(2+3)**	**CO3**