Total pages: 03

PG (CBCS)
M.SC. Semester- IV Examination, 2026
CHEMISTRY
PAPER: CEM 402
(ADVANCED ORGANIC CHEMISTRY-III)

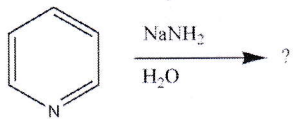
Full Marks: 40 **Time: 2 Hours**

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

1. Answer any FOUR of the following questions: **4×2=8**

a) Write a short note on Hoffmann–Löffler–Freytag reaction.
b) Define energy transfer phenomenon in organic photochemical reactions.
c) Write down the structure of FMN.
d) Define coenzymes.
e) How to prepare pyridazine starting from maleic anhydride?
f) Wtite down the product of the following reaction



GROUP-B

2. Answer any FOUR of the following questions: **4×4=16**

a) What is Norrish type II reaction? Write down the condition for cyclobutanol formation in Norrish type II reaction. (4)
b) What will happen when quinoline reacts with acetyl nitrate? (4)
c) Identify the products of cyclopentenone dimerization reaction under photochemical condition and also discuss about the expected product ratio in methanol and hexane differently as a solvent.
d) Discuss about major functions of vitamin A. What are vitamins? (3+1)
e) Write down the structure of penicillin G. How penicillins are biologically active towards bacteria? (1+3)
f) Define photoreduction. Explain why the following reaction has $\phi = 1$

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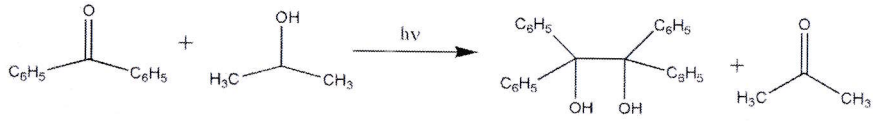
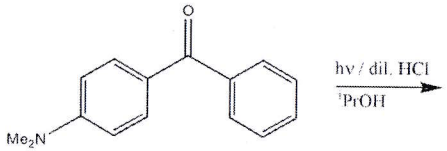


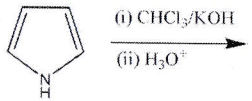
GROUP-C

3. Answer any TWO of the following questions: **2×8=16**

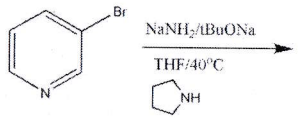
a) (i) 'Michler's ketone does not undergo photoreduction under the same condition at which benzophenone absorbed'-Justify.
(ii) Comment on the feasibility of the following reaction:- (4+4)



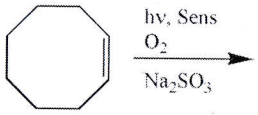
b) Write down the products of the reactions with suitable mechanism:
(i)



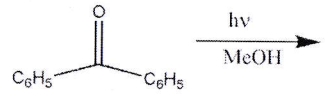
(ii)



(iii)



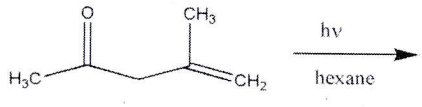
(iv)

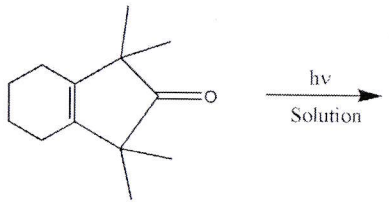


(2×4)

c) (i)Write down the scope and limitations of Paterno-Büchi addition reaction.
(ii) Discuss briefly on photolysis of hypohalites. (4+4)

d) (i) Butadiene exists in solution as a mixture of *S-trans* (95%) and *S-cis* (5%) conformers but direct irradiation of butadiene yield cyclobutene and bicyclo [1.1.0] butane in 95% and 5% respectively. Explain the above observation.
(ii) Complete the following reactions:





(4+4)

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