

This question paper contains 5 printed pages]

AY—80—2018

FACULTY OF SCIENCE

M.Sc. (First Year) (First Semester) EXAMINATION

MARCH/APRIL, 2018

CHEMISTRY

Paper (CH-412)

(Organic Chemistry-I)

(Wednesday, 11-4-2018)

Time : 10.00 a.m. to 1.00 p.m.

Time—3 Hours

Maximum Marks—75

N.B. :- (i) Attempt All questions.

(ii) Figures to the right indicate full marks.

(iii) Multiple Choice Questions (MCQs) should be attempted only once on page number three of answer-book with complete answer.

1. Answer any *three* of the following : 15

(a) Nitration of toluene gives 58% ortho and 37% para isomers, whereas nitration of tert. butyl benzene gives 16% ortho and 73% para product. Explain.

(b) Explain Hammond's postulate with energy profile diagram.

(c) Explain vinyl chloride is unreactive towards S_N^1 and S_N^2 reaction.

(d) Explain the conversion of S_1 to T_1 is effectively achieved in benzophenone but not with 1, 3-butadiene.

(e) Conversion of organonitriles into nitroso alcohol can be explained under photochemical condition.

P.T.O.

2. Answer any *three* of the following :

15

- (a) Explain generation and stability of free radicals and carbene.
- (b) What is antiaromaticity ? Explain alternant and non-alternant hydrocarbon.
- (c) Explain neighbouring group participation by σ and π bonds ?
- (d) What is Paterno-Buchi reaction ? Discuss mechanism along with stereochemical sequence.
- (e) Explain the photochemistry of vision.

3. (A) Comment on the following :

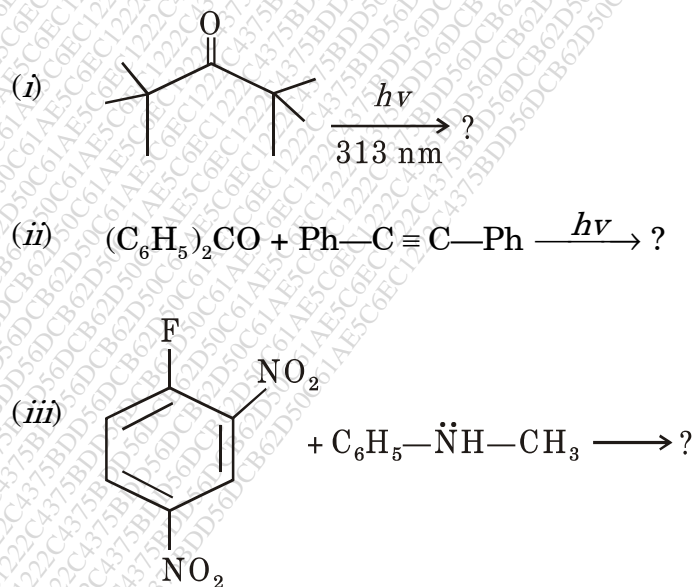
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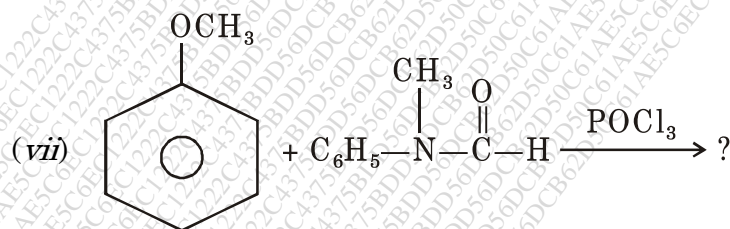
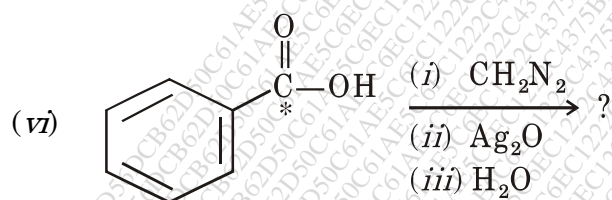
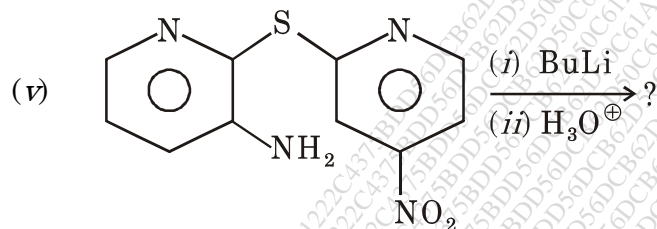
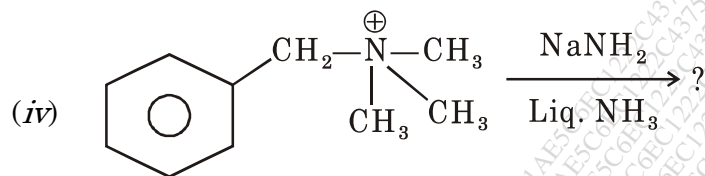
- (i) Benzenoid and non-benzenoid
- (ii) Hammett equation.

Or

What is photochemistry ? Explain $n-\pi - p\pi$ rearrangement with suitable example.

(B) Predict the product(s) with mechanism of the following (any *four*) : 8





4. (A) What are Norrish type I and II reaction ? Explain its mechanism with suitable example. 7

Or

Discuss the following :

- (i) Anchimeric assistance
(ii) Von Richter reaction.

P.T.O.

(B) Explain the following : 8

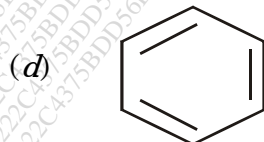
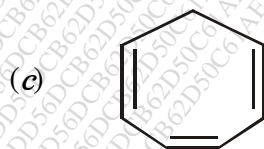
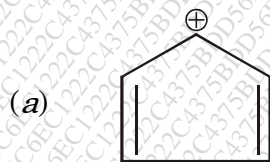
- (i) IPSO-substitution reaction.
- (ii) Gattermann-Koch reaction.

Or

- (i) What are annulenes ? Explain the aromaticity of [14] annulenes.
- (ii) Taft equation.

5. (A) Select the *correct* answer from the following Multiple Choice Questions : 5

- (i) The removal of diazo group from benzene diazonium salt is an example of :
 - (a) SN^2
 - (b) E_1CB
 - (c) SE^2
 - (d) $ArSN^1$
- (ii) Which one of the following compounds will be non-aromatic in nature ?



- (iii) Conversion of benzophenone to benzpinacol photochemically is an example of
- (a) Norrish type-I
 - (b) Photo reduction
 - (c) Paterno-Buchi reaction
 - (d) Norrish type III
- (iv) The aryne mechanism follows the route :
- (a) Elimination-addition
 - (b) Addition
 - (c) Elimination
 - (d) Addition-elimination
- (v) Carbon atom of carbene in singlet state is :
- (a) $sp^3 d$
 - (b) sp^2
 - (c) sp^3
 - (d) sp

(B) Write short notes on (any two) :

10

- (i) Jablonski diagram
- (ii) S_N^i -reactions
- (iii) Homoaromaticity.