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SEAT No. _____

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[93]

SARDAR PATEL UNIVERSITY

M.Sc. (Organic Chemistry) Examination (CBCS) IIIrd Semester

April-2018

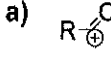
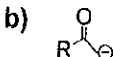
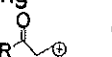

Wednesday, Date: 11.04.2018

Time: 2.00 p.m. to 5.00 p.m., Paper: PS03CORC02

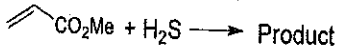
Subject: Organic synthesis: a disconnection approach, Max. Marks: 70





N.B.: i) Figures to the right indicate marks which are carried by each question

Q.1 Answer with correct option highlighted [08]

- i) Logically, possible ways to disconnect PhCH₂OH into...
 - a) PhCOOEt + 2H⁺ b) PhCHO + H⁺ c) Both a) and b) d) Ph⁺ + CH₂OH
- ii) Part(s) of mechanism of Grignard reagent synthesis is/are
 - a) 2RX + Mg → R-R + MgX₂ b) Mg + MgX₂ → 2MgX
 - c) 2MgX + RX → RMgX + MgX₂ d) All
- iii) Identify conditions(s) to access PhCH(OH)COOH from PhCHO
 - a) i) KCN, ii) NH₃ b) i) H₂O, ii) KCN c) i) KCN, ii) OH⁻/H₂O d) None
- iv) Identify illogical synthon from the following
 - a)  b)  c)  d) 

v) Identify right product from the reaction below



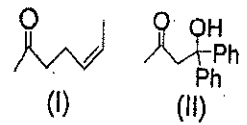
- a) HS-CH₂-CH₂-CO₂Me b) HS-CH=CH-CO₂Me c) HS-CH₂-CH=CH-CO₂Me d) S-CH₂-CH₂-CO₂H
- vi) The ketene formation involved in the mechanism of ...
 - a) Diels-Alder Reaction b) Arndt-Eistert Reaction
 - c) Perkin reaction d) Dickmann reaction
- vii) Polarity of alkylbromide (RBr) is reversed in...
 - a) RMgBr b) RLi
 - c) RZnBr d) All
- viii) Photochemical cycloaddition of two ethylene molecules yields
 - a)  b)  c)  d) 

Q.2 Attempt any SEVEN [14]

- i) State the term 'logical and illogical synthons', with suitable examples.
- ii) Illustrate FGI, with suitable examples
- iii) State the term SE. Suggest suitable SE to synthesize RCH₂OH
- iv) Show in brief disconnection and synthetic approach of the acid RCOOH
- v) Describe in brief disconnection and synthesis of 1,4-dicarbonyl compound
- vi) How will you reduce nitro, oxime and nitrile groups? Explain
- vii) State 'ylide'. Give synthesis of styrene oxide using sulphur ylide
- viii) State the importance of Michael reaction in the disconnection approach
- ix) List key criteria for describing the disconnection best approach to TM

Q.3 a) What are acetal and ketal? State their formation with suitable examples. [06]

b) Design the synthesis of TMs below [06]

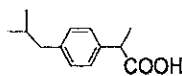


[P. T. O.]

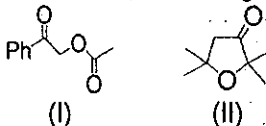
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OR

- b) Give strategy to disconnect acid RCOOH. Design synthesis of TM below



- Q.4 a) State illogical two-group disconnection, and design synthesis of TMs below [06]

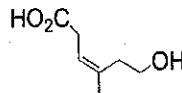


- b) State the synthesis of 1,2-diol. Disconnect and plan synthesis of TM below [06]

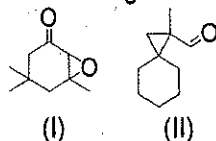


OR

- b) Show strategy to disconnect 1,6-dicarbonyl system. Plan the synthesis of TM below, showing its disconnection



- Q.5 a) Show disconnection and synthesis design of TMs below [06]



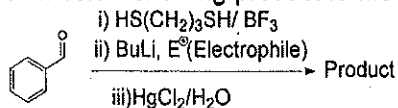
- b) State use of SOCl_2 , Wittig reaction and NaBH_4 in organic synthesis [06]

OR

- b) Show general strategies to achieve disconnection of heterocyclic systems. Disconnect and design synthesis of 6-methyl-piperidine-2,4-dione

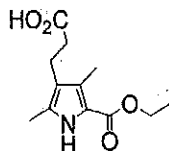
- Q.6 a) State the term 'umpolung'. Benzoin condensation is an example of umpolung strategy! Explain [06]

- b) Complete the conversion below showing product formed at each stage [06]



OR

- b) Disconnect and design synthesis of Mesoporphyrin IX precursor shown below



②