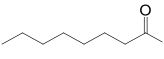


K1 Level

- Which of the following molecular formula for diterpenoids?
a) **C₂₀H₃₂** b) C₁₀H₁₆ c) C₆H₆ d) all
- Choose the molecular formula for natural terpenoids hydrocarbon
a) **(C₅H₈)_n** b) (C₅H₈) c) (C₅H₇)_n d) all
- Select the following product obtained by the oxidation of dihydrozingiberene with KMnO₄
a) Tricarboxylic acid b) **Keto dicarboxylic acid** c)  d) all
- Find the following reaction involved in conversion of squalene to formaldehyde, acetaldehyde and succinic acid
a) **Dehydrogenation** b) oxidation c) reduction d) redox reaction e) all
- Name the following product are obtained from α-pinene by bromination
a) **α-pinene dibromide** b) α-terpineol (c) α-pinene bromide d) none
- Which of the following molecular formula for santonin?
a) **C₁₅H₁₈O₃** b) C₁₀H₁₈O₃ c) C₁₅H₁₈O₂ d) none
- Choose the molecular formula for squalene
a) **C₃₀H₅₀** b) C₃₂H₅₂ c) C₃₀H₅₁ d) none
- Select the following product are obtained by the reduction of santonin oxime
a) hyposantonin b) **amine santonamine** c) santoninic acid d) all
- Find the following reaction involved in conversion of caryophyllene to mono epoxide
a) **oxidation** b) reduction c) redox d) none
- Name the following product obtained from eudesmol by catalytic hydrogenation.
a) **dihydroeudesmol** b) eudalene c) naphthol d) none
- Which of the following molecular formula for Diel's hydrocarbon?
a) **C₁₈H₁₆** b) C₁₀H₁₆ c) C₆H₆ d) all
- Choose the molecular formula for cholesterol
a) **(C₂₇H₄₆O)** b) (C₁₅H₂₈O) c) (C₅H₇O) d) all

13. Select the following product obtained by the selenium dehydrogenation of cholesterol
- a) C_6H_6 **b) $C_{18}H_{16}$** c) $C_{10}H_{16}$ d) all
14. Find the following reaction involved in conversion of aetiobilanic acid in to aetiobilanic anhydride
- a) Dehydrogenation **b) thermal** c) reduction d) redox reaction e) all
15. Name the following product are obtained from ergosterol by ozonolysis
- a) methylisopropyl acetaldehyde** b) stigmasterol (c) quercetin d) none
16. Which of the following molecular formula for santonin?
- a) $C_{15}H_{18}O_3$** b) $C_{10}H_{18}O_3$ c) $C_{15}H_{18}O_2$ d) none
17. Choose the molecular formula for ergosterol
- a) $C_{28}H_{44}O$** b) $C_{32}H_{52}O$ c) $C_{30}H_{51}O$ d) none
18. Select the following product are obtained by the oxidation of dehydroepiandrosterone
- a) hyposantonin **b) androsterone dione** c) testosterone d) all
19. Find the following reaction involved in conversion of cholesterol to cholestanol
- a) oxidation **b) reduction** c) redox d) none
20. Name the following product obtained from cholestanone on treatment with CH_3MgI followed by Se
- a) 3',7-dimethyl cyclopenteno phenanthrene** b) 3,7-dimethyl cyclopenteno phenanthrene
c) naphthol d) none
21. Which of the following molecular formula is flavone?
- a) $C_{15}H_{10}O_2$** b) $C_{10}H_{16}O$ c) C_6H_6 d) all
22. Choose the molecular formula for cyaniding chloride
- a) $C_{15}H_{11}O_6Cl$** b) (C_5H_8Cl) c) (C_5H_7) d) all
23. Select the following molecular formula for D-penicillamine
- a) $C_{10}H_{16}O$ **b) $C_5H_{11}NO_2S$** c) $C_{15}H_{11}O_6Cl$ d) all

24. Find the following reaction involved in conversion of pelergonin chloride in to pelergonidin chloride
- a) Dehydrogenation **b) Hydrolysis with HCl** c) reduction d) redox reaction e) all
25. Name the following product are obtained from cyanin chloride by hydrolysis with HCl
- a) cyanidin chloride b) D-glucose **(c) both a and b** d) none
26. Which of the following molecular formula is penicillin?
- a) $C_9H_{11}N_2O_4SR$** b) $C_{10}H_{18}O_3$ c) $C_{15}H_{18}O_2$ d) none
27. Choose the molecular formula for penilloaldehyde
- a) $C_3H_4NO_2R$** b) $C_{32}H_{52} NOR$ c) $C_{30}H_{51}$ d) none
28. Select the following molecular formula of streptomycin
- a) $C_{21}H_{39}N_7O_{12}$** b) $C_3H_4NO_2R$ c) $C_9H_{11}N_2O_4SR$ d) all
29. Find the following reaction involved in conversion of penicillin to penicilloic acid
- a) Hydrolysis wit alkali** b) reduction c) redox d) none
30. Name the following product obtained from the reaction between 2,4-dihydroxy phenyl p-hydroxy benzyl ketone and ethyl formate
- a) daidzein** b) quercetinc) curcumin d) none
31. Which of the following product is obtained from self condensation of aromatic aldehydes in Presence of CN^- ion?
- a) Benzoin** b) Phenone c)  d) all
32. Choose the following compound is not successfully undergoing benzoin condensation
- a) aliphatic aldehydes** b) ketone) aromatic aldehyde d) all
33. Select the following product obtained by the Dieckmann condensation
- a) cyclic ketone** b) aldehyde c) acid d) all
34. Find the following reaction involved in conversion of aldehydes or ketones in to α -haloester
- a) Darzen glycidic ester condensation** b) benzoin condensation c) birch reduction d) all
35. Name the following products are obtained from knoevenagel condensation
- a) crotonic acid** b) butanal (c) both a and b d) none

36. Which of the following product is obtained from Mannich reaction?
a) Mannich base b) Tertiary base c) quaternary base d) none
37. Choose the products obtained from Stobbe condensation
a) α , β -unsaturated halo ester b) ester c) aromatic ketone d) none
38. Select the following product is obtained from intermediate imine by hydrolysis
a) hyposantonin **b) α -cyanoketone** c) santonic acid d) all
39. Find the following reaction involved in conversion of phosphonium salt from triphenylphosphine
a) Wittig reaction b) aldol condensation c) redox d) none
40. Name the following product obtained from Wolff rearrangement.
a) ketene b) aldehyde c) ester d) none
41. Which of the following product is obtained from iodobenzene react with lithium dimethyl cuprate?
a) Toluene b) phenol c) benzene d) all
42. Choose the following product is obtained from p-nitro benzoyl chloride react with lithium dimethyl cuprate
a) p-nitroacetophenone b) o-nitroacetophenone c) both a and b d) all
43. Select the following higher order cuprate
a) $R_2Cu(CN)Li_2$ b) $RCuLi$ c) both a and b d) all
44. Find the following reagent involved in the conversion of alkyl halide to methyl lithium
a) Li b) CH_3Li c) CH_2Li d) all
45. Name the following product is obtained from LDA reagent
a) alkyne b) alcohol (c) acid d) none
46. Which of the following product is obtained from Vilsmeier reaction?
a) 2,4 dimethoxy benzaldehyde b) dimethoxy benzaldehyde c) quaternary base d) none
47. Choose the product obtained from the reaction of pyridine to a solution of chromium (VI) oxide in HCl
a) PCC b) DBU c) aromatic ketone d) none

48. Select the following compound name is Wilkinson catalyst

a) triphenyl **b) chloro rhodium** (I), tris triphenyl phosphine c) santonic acid d) all

49. Find the following reagent involved in conversion of primary alcohols to aldehydes in presence of DMF

a) PDC b) DCC c) PCC d) none

50. Name the following compound is belongs to amidine compound.

a) DBU b) DCC c) PDC d) none

K2 level

1. Show any two medicinal values of santonin
2. What is Isoprene rule?
3. List out any two chemical properties of terpenes?
4. Define gem dialkyl rule.
5. Why trans fusion is impossible to α -pinene?
6. Show any two uses of rosin and colophony
7. List out any two major resin acid
8. What is the product obtained from retene by degradation?
9. Define DBE.
10. Show any two uses of vitamin-D₄
11. Show any two functions of progesterone.
12. What is coprostane?
13. List out the products formed by cholesterol acetate on oxidation with chromic acid?
14. How to confirm position of methyl group for cholesterol?
15. Why the structure of bile acids is different from sterols?
16. Show any two uses of testosterone.
17. List out any two sources of monohydroxy cholonic acid.
18. Show the position and configuration of OH group for cholic acid
19. What is the product obtained from dehydroepiandrosterone by oxidizing yeast with O₂?
20. Why β -hydroxy cholic acid cannot be converted in to lithocholic acid?
21. Show any three points constitute the primary structure of proteins
22. What is a protein?
23. List out two different conformations for secondary structure of proteins?
24. Define hydrazinolysis.
25. Why penicillamine containan isopropyl end group instead of methyl end group?

26. Show any two uses of aminopeptides
27. List out any four uses of RNA
28. What are the side effects of streptomycin?
29. Define antibiotic.
30. Show any four important uses of DNA
31. Show any one application of Wagner Meerwin rearrangement.
32. What is Thorpe rearrangement?
33. List out any one application of Neber rearrangement?
34. Define Claisen condensation.
35. Why is Baeyer-Villiger rearrangement much faster than peracetic acid ?
36. Show any one application of Stevens rearrangement
37. List out any one application of Fries rearrangement.
38. What are the products obtained from Arndt-Eistner reaction?
39. Define Benzidine rearrangement.
40. Show any one application of Curtius rearrangement
41. Show any one application of DBU.
42. What is Peterson olefination?
43. List out any one application of NBS?
44. Define Vilsmeier reaction.
45. Why is alcohol activation needed for elimination reaction?
46. Show any one application of Triethyl silyl Iodide
47. List out any one application of carbonyl activation.
48. What are the products obtained from Gilman's reagent?
49. Define retrosynthesis.
50. Show any one application of sulfonylation reagents.

K3 level

1. Discuss the classification and isolation of terpenoids.
2. Explain the structural elucidation of zingiberene.
3. Describe the synthesis of zingiberene.
4. Demonstrate the Karrer and Helfenstein synthesis of squalene.
5. Elaborate and give justification for mixture of 4 isomeric form of squalene.
6. Illustrate the conversion of pinol to sobrerithritol.
7. Deduce the synthesis of following compounds.
i) cis-norpinic acid ii) terpenylic acid
8. Establish the synthesis and uses of santonin
9. Compose the structural elucidation for caryophyllene.
10. Propose the synthesis for the following compounds.
i) caryophyllene ii) 2,2-dimethyl-4-keto glutaric acid
11. Discuss the structure of Diel's hydrocarbon.
12. Explain the following terms of cholesterol.
i) Occurance ii) function ii) extraction and isolation
13. Describe the synthesis of ergosterol.
14. Demonstrate the structural elucidation of ergosterol.
15. Elaborate the synthesis of progesterone.
16. Illustrate the structural elucidation for progesterone.
17. Deduce the synthesis of progesterone from the following compounds.
i) stigmasterol ii) cholesterol
18. Establish the synthesis and uses of testosterone
19. Compose the structural elucidation for testosterone.
20. Propose the synthesis for the following compounds.
i) deoxycholic acid ii) lithocholic acid

21. Discuss the primary and secondary structure of proteins.
22. Explain any two methods of C- terminal and N- terminal residue analysis.
23. Describe the synthesis of polypeptides.
24. Demonstrate the synthesis of enzymes.
25. Elaborate the bio synthesis of proteins.
26. Illustrate and draw the tertiary structure of proteins.
27. Deduce the synthesis of following compounds.
i) Penicillin ii) streptomycin
28. Establish the synthesis and uses of erythromycin and Chloromycetin
29. Compose the structural elucidation for tetracycline.
30. Propose any two syntheses for the following compounds.
i) uracil ii) cytosine iii) thiamine
31. Discuss the mechanism of following condensation.
i) Benzoin ii) Dieckmann
32. Explain mechanism for the following condensation reaction
i) Darzen ii) Knoevenagel
33. Describe the mechanism of Mannich reaction and stobbe condensation
34. Demonstrate the mechanism of Thorpe and Wittig reaction
35. Elaborate mechanism of following condensation
i) Claisen ii) Dieckmann
36. Illustrate the mechanism for Wagner-Meerwin rearrangement and dienone phenol rearrangement.
37. Deduce the mechanism for following rearrangement
i) Wolf ii) favorski
38. Establish mechanism for following rearrangements
i) Neber ii) Bayer villager
39. Compose the mechanism for Stevens and chapman rearrangement with applications.

40. Propose the mechanism for following rearrangement with applications.
i) Benzidine ii) Fries
41. Discuss the preparation and applications of Gilman's reagent.
42. Explain the preparation and applications of Lithium Dimethyl Cuprate
43. Describe the preparation and application of lithium diisopropyl amide
44. Demonstrate the preparation and application of Trimethyl silyl iodide
45. Elaborate mechanism of Peterson's synthesis with applications.
46. Illustrate the mechanism of Vilsmeier reaction and its applications
47. Deduce the preparation and synthetic application for the following compounds
i) DBU ii) DCC
48. Establish preparation and synthetic application for the following compounds
i) 1,5-diazabicyclo[5.4.0] undecene-5 ii) Dicyclohexylcarbodiimide
49. Compose the preparation and synthetic application for NBS.
50. Propose the mechanism and synthetic application for PCC.

K4 level

1. Discuss in detail about the synthesis and structural elucidation of abietic acid.
2. Describe the synthesis and structural elucidation of eudesmol.
3. Illustrate the structural elucidation and synthesis of α -santonin.
4. Explain in detail about the synthesis and structural elucidation of α -pinene.
5. Elaborate the structural elucidation and synthesis of squalene.
6. Demonstrate the structural elucidation and synthesis of zingiberene.
7. Discuss in detail about the position of hydroxyl group and double bond of cholesterol.
8. Describe the nature and position of the side chain of cholesterol.
9. Illustrate the point of attachment of the side chain to the nucleus and position of angular methyl group of cholesterol.
10. Explain in detail about the synthesis and structural elucidation of ergocalciferol.
11. Elaborate the structural elucidation and synthesis of bile acid.
12. Demonstrate the structural elucidation of vitamin-D₃ and D₄ with DBE.
13. Discuss in detail about the structure and application of RNA and DNA.
14. Describe the following synthesis of flavones.
 - i) Chalcone ii) Baker venkataraman iii) Wheeler iv) Robinson v) Kostanecki
15. Illustrate the following synthesis of purines and guanine.
 - i) Fischer ii) Traube iii) Todd iv) Brederick
16. Explain in detail about the synthesis and structural elucidation of cyanin chloride.
17. Elaborate the structural elucidation and synthesis of pelargonidin chloride.
18. Demonstrate the structural elucidation and synthesis of penicillin.
19. Discuss in detail about the mechanism and application of the following rearrangements.
 - i) Arndt Eister synthesis ii) Lossen iii) Wallac
20. Describe the mechanism, application of following rearrangements.
 - i) Curtius ii) Hoffmann-Löffler-Freytag iii) Demjanov
21. Illustrate the mechanism, application of Von-Richter, Sommelet Hauser and Smiles rearrangements.

22. Explain in detail about the applications for following condensation reactions.
i) Benzoin ii) Dieckmann iii) Darzen iv) Knoevenagel v) Mannich.
23. Elaborate the application for following mechanism..
i) Stobbe ii) Thorpe iii) Wittig iv) Claisen v) Dieckmann
24. Demonstrate the application for following rearrangements.
i) Wagner-Meerwin ii) Dienone phenol iii) Wolf iv) Favorski v) Neber vi) Bayer villager
25. Discuss in detail about the preparation and synthetic applications of PDC and Wilkinson's catalyst.
26. Describe the retro synthesis analysis of simple organic compounds.
27. Illustrate the mechanism, role and application of functional group interconversion in retro synthesis.
28. Explain in detail about the application of activation and protecting group in retro synthesis.
29. Elaborate the preparation and application for following reagents.
i) LDC ii) LDA iii) Trimethyl silyl iodide iv) Gilmans
30. Demonstrate the preparation and application for following compounds.
i) DBU ii) DCC iii) NBS iv) PCC v) PDS