KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

06 JUN 2019

Level : B. Pharm.
Year : III
Time : 2 hrs. 30 mins.

Course : PHAR 304
Semester: I
F.M. : 55

SECTION "B"
[5Q. × 3 = 15 marks]

Attempt *ANY FIVE* questions.

1. Draw the outline of biosynthetic pathway of Ephedrine in plant.
2. Write down the structural activity relationship (SAR) of Lysergic acid and Ergotamine alkaloids with their structural formula.
3. Briefly explain the chemistry of squill glycosides with suitable structures.
4. Highlight the structural variations in sesquiterpenoids.
5. Explain the detection process for the amount of usnaturation in the terpenoidal compounds.
6. Describe unique features of Sapogenin type of steroids with their structure.
7. Briefly highlight the role of peptide hormones in the human body.

SECTION "C"
[5Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions.

8. Describe the general process of Capsaicin biosynthesis in plants.
9. Compare the structural diversity related medicinal variations within the tetra-terpenoids.
10. Describe the structural elucidation process of beta-Carotene.
11. Briefly explain the nomenclature process of steroids and also give the examples.
12. Write down Diels Alder reaction with the mechanism.
13. Classify the plant lignans and also give the medicinal values of some compounds.
14. Describe the catecholamines and their role in human body.

SECTION "D"
[2Q. × 7.5 = 15 marks]

Attempt *ANY TWO* questions.

15. Classify the flavonoids and also write down the medicinal values of selected compounds with their structures.
16. Describe the uses and their structural patterns with special reference to major active compounds of digitalis and opium.
17. Explain the general method of the structural elucidation of terpenoids.

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SECTION "A"
[20Q. × 1 = 20 marks]

Encircle the most appropriate answer among the given choices.

1. Those Alkaloids containing iso-quinolin ring in their structures
   a. Cinchonidine & Cusparin
   b. Emetine & Cephaline
   c. Baldine & Lupanine
   d. Nicotine & Lobaline

2. When alkaloid is treated with excess of CH_3I to form quartertionarey –ammoniumiodide and then converted to the hydroxide, it is considered determination method of
   a. Hoffmann's exhaustive methylation
   b. Emde degradation method
   c. Von Braun's degradation method
   d. Kuhn –Roth Oxidation method

3. Only one methoxy group is present in the structure of
   a. Reserpine
   b. Ergometrine
   c. (*S*)-Coclaurine
   d. Ephedrine

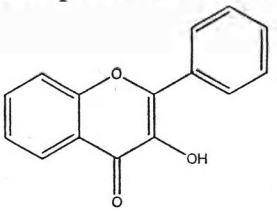
4. Better metabolic stability is observed in plant phenolics for cancer chemopreventive property, if the structure is capped by methylation at the position of
   a. 5,7′,4-trimethoxyflavone
   b. 5,7,4-trimethoxyflavone
   c. 5,7,4′-trimethoxyflavone
   d. 5,7′,4′-trimethoxyflavone

5. The volatile oils mostly consist of a mixture of.....
   a. Aliphatic and cyclic mono- and triterpenes
   b. Aliphatic and cyclic mono- and sesquiterpenes and phenyl-propane derivatives
   c. Oxygenated di- and tri-terpenes
   d. Mostly tetra-terpenes and some bi-cyclic sester-terpenoids.

6. The mechanism of the Diels-Alder reaction is a suitable example of
   a. Rearrangement reaction
   b. Condensation reaction
   c. Substitution reaction
   d. Addition reaction

7. In the structure of insulin there are two peptide chains (A & B) and 3 disulphide bridges. One disulphide bridge is found within the A chain in between A6 & A11 amino acids. Now, find the appropriate position of remaining two disulphide bridge in between the A and B chains.
   a. A7 & B7, A20 & B19
   b. A7 & B7, A19 & B20
   c. A8 & B7, A20 & B19
   d. A7 & B8, A19 & B20

8. The following structural skeleton of plant phenolics is related to flavanoid class of
   a. Catechin
   b. Epicatechin
   c. Isoflavone
   d. Flavone



9. Flavonoids by UV-spectroscopy have revealed that most flavones and flavonols exhibit two major absorption bands ..... and ..... representing ring A and ring B respectively
   a. Band II (250–285 nm) and Band I (320–385 nm)
   b. Band I (320–385 nm) and Band II (250–285 nm)
   c. Band II (350–485 nm) and Band I (220–385 nm)
   d. Band I (250–285 nm) and Band II (320–385 nm)

10. Carotenoid that has a potential effect in maintaining eye health
   a. Luteoxanthin b. Astaxanthin c. β-Carotene d. Violoxanthin

11. A compound which inhibits the cholesterol absorption from the intestines and also appears to be able to protect cells from excitotoxicity
   a. Pinoresinol b. Sesamin c. Syringaresinol d. Lariciresinol

12. Degradative products of Citral on treatment with alkaline $KMnO_4$ followed by chromic acid are
   a. Acetone, Laevulic acid and Oxalic acid
   b. β-Hydroxy acid, Acetone, Laevulic acid
   c. Geranic acid, Laevulic acid and Oxalic acid
   d. Adipic acid, Ketomenthylic acid and Acetone

13. Carvone hydrobromide with Zinc dust and MeOH is converted into Carvotanacetone, then oxidized giving product isopropyl succinic acid , structurally indicates that
   a. The double bond is present at 6 C of Carvone.
   b. Double bond is present in the position 8 C Carvone
   c. Cyclic structure of Carvone
   d. Presence of keto group in Carvone

14. Find a glucocorticoid hormone, synthesized from progesterone in the *zona fasciculata* of the adrenal cortex, involved in stress adaptation, elevates blood pressure and Na^+ uptake.
   a. Cortisol b. Estradiol c. Pregnenolone d. Testosterone

15. An Abietic acid is a terpenoid belongs to class of
   a. Monocyclic sesquiterpenoid b. Tricyclic diterpenoid
   c. Bicyclic sesquiterpenoid d. Bicyclic diterpenoid

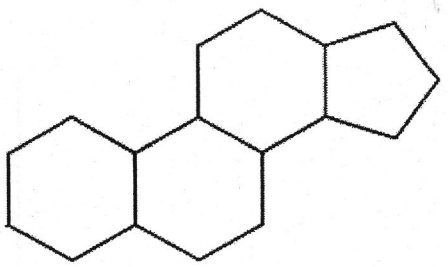
16. When ring expansion occurred in steroid nucleus by inclusion of methyl group, that is indicated by the 'prefix'
   a. Des- b. Seco- c. Homo- d. Nor-

17. In the Reformatsky reaction, ------ is used as a reactant.
   a. α-halo ester b. β-hydroxy ester
   c. α, β unsaturated compounds d. Aromatic aldehydes

18. Strodival drug which is synthesized from Saillarin-A have high therapeutic index which
   a. Act as an inhibitor of the NA(+)/K(+)-exchanging ATPase.
   b. Converts toxic HCN into harmless thycynide
   c. Stimulates the sympathomimetic agonist of adrenergic receptors
   d. Arrest the cell cycle of cancer cells at G1 phase.

Answer the questions.

19. Give the appropriate carbon numbers in following provided skeleton of steroid.



20. Draw a chemical structure of papaverine.