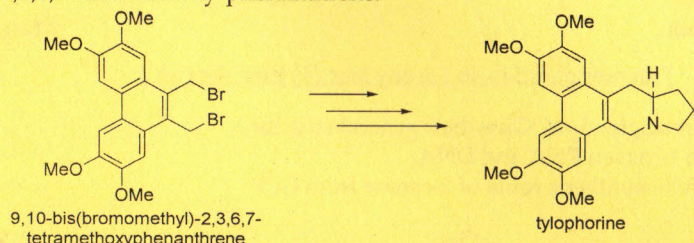


- (b) Give the synthetic route of tylophorine from 9,10-bis(bromomethyl)-2,3,6,7-tetramethoxyphenanthrene.



- (c) Write down the structures of Exaltone and Muscone. Establish the structure of Muscone.
5. (a) Explain about the stereochemistry of steroids.
 (b) How squalene can be biosynthesized from dimethylallyl pyrophosphate?
 (c) What are oestrogens (estrogens)? How oestradiol (estradiol) can be synthesized from oestrone?
 (d) What are equilenins? Explain the synthesis of equilenins.
6. (a) What will be the structure of DNA segment (base sequence) that will be responsible to synthesize the tetrapeptide having the sequence Ala.Lys.Gly.Val. The codons for these amino acids are Ala=CUG, Lys=AAG, Gly=GAG and Val=GUU.
 (b) What are exons and introns?
 (c) Write a short account of bio-synthesis of nucleic acids.
7. (a) Give a brief description of bio-synthesis of proteins.
 (b) What are corticosteroids? Explain about the steps involved in the degradation of diosgenin to progesterone.
8. (a) How carotenoid acts as a quencher? Explain.
 (b) Write down the steps involved in the chemical synthesis of β -carotene.
 (c) What products will be formed when riboflavin is irradiated with light under acidic and alkaline condition?
 (d) How pyridoxal phosphate (PLP) is involved in the decarboxylation process of amino acids? Explain with examples.

== *** ==

2.5

5

2

3

2

3

5

2

3

5

2+3=5

2

3

2

3

REV-00
MSC/42/47

M.Sc. CHEMISTRY
 FOURTH SEMESTER
 ORGANIC CHEMISTRY-IV
 (NATURAL PRODUCT CHEMISTRY)
 MSC-402 A

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70


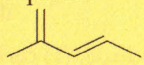

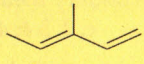
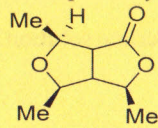
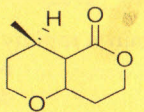
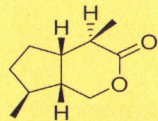
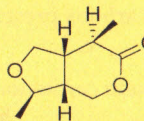
(PART-A : Objective)

Time : 20 min.

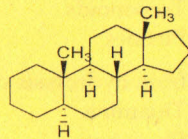
Marks : 20

Choose the correct answer from the following:

1x20=20

1. Which of the followings is the structure of Isoprene?
 a.  b. 
 c.  d. 
2. The DMAPP & IPP are formed in the plastid from:
 a. acetyl-CoA b. acetoacetyl-CoA
 c. mevalonic acid d. pyruvic acid & D-glyceraldehyde- 3-phosphate
3. The example of cyclopentato monoterpene lactone is:
 a.  b. 
 c.  d. 
4. Longifolene is an example of:
 a. monoterpene b. diterpene
 c. sesterpene d. sesquiterpene
5. In the biosynthesis of *trans*-chrysanthemic acid, the cyclopropane ring formation takes place due to the reaction between:
 a. DMAPP & IPP b. DMAPP & DMAPP
 c. IPP & IPP d. FPP & IPP
6. Shikimic acid can be an intermediate in bio-synthesis of:
 a. Alkaloids b. Terpenoids
 c. Steroids d. Purines
7. The substance which will not be obtained from hydrolysis of nucleotides from DNA:
 a. Adenine b. Thiamine
 c. Ribose d. Phosphate
8. Exaltone and Muscone are:
 a. Alkaloids b. Terpenoids
 c. Carbohydrates d. Lipids

9. Which of the following is a **wrong** statement?
- triglycerides are saponifiable lipids.
 - Cis-Jasmone is a terpenoid.
 - bio-synthesis of palmitic acid involve CH_3COSCoA .
 - steroids are non saponifiable lipids.
10. Which of the following statement is **wrong** about DNA molecules?
- 3 different helical structures are available.
 - % of guanine concentration is same as cytosine.
 - m-RNA is formed complementary to sense strand of DNA.
 - All statements are not correct.
11. Which of the following is a **wrong** statement about linolenic acid?
- It is an essential fatty acid
 - It is a ω -3 acid
 - It contains two C=C
 - All C=C have cis-configuration
12. Of the following natural products, (1) carbohydrates, (2) amino acids, (3) alkaloids and (4) carotenoids, which are secondary metabolites?
- 1, 2 & 3
 - 3 & 4
 - 2, 3 & 4
 - 2 & 4
13. Which of the following can produce alkaloids?
- Carbohydrates
 - Lipids
 - Nucleotides
 - Some amino acids
14. The number of conjugated double bonds in lycopene is:
- 10
 - 11
 - 12
 - 13
15. Which of the following vitamin is rapidly oxidized in neutral or alkaline solution?
- Vitamin C
 - Vitamin B₂
 - Vitamin E
 - Vitamin B₁
16. The number of asymmetric carbons present in tocopherols is:
- 4
 - 5
 - 3
 - 6
17. Which of the following is a keto carotenoid?
- Lycopene
 - β -carotene
 - Canthaxanthene
 - Lutein
18. Which of the following acts as a biochemical precursor of steroids?
- Equelenin
 - Phytoene
 - Squalene
 - β -carotene
19. The two angular methyl groups in steroids are present in:
- C-9 and C-10 position
 - C-10 and C-13 position
 - C-10 and C-17 position
 - C-13 and C-17 position
20. The following steroid molecule can be named as:



- 5 β -Androstane
- 5 α -Androstane
- 5 α -Gonane
- 5 β -Gonane

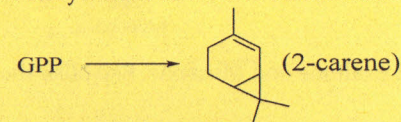
[PART-B : Descriptive]

Time : 2 hrs. 40 min.

Marks : 50

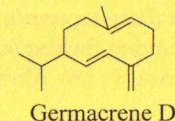
[Answer question no.1 & any four (4) from the rest]

1. (a) What are prostaglandins? Give their general structure. 2x5=10
 (b) Distinguish between RNA and DNA.
 (c) Write down biosynthetic route of 2-carene from GPP

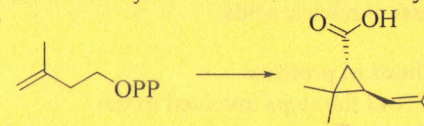


- (d) How vitamin A can be biosynthesized from β -carotene?
 (e) Explain the chemistry of pyridoxine.

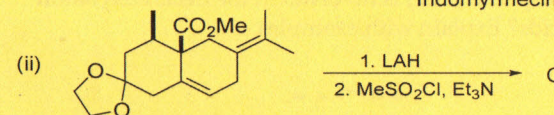
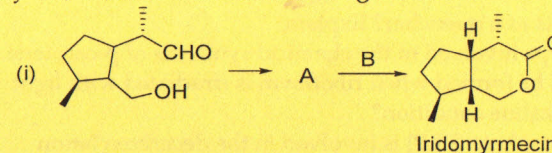
2. (a) Show the biosynthesis of FPP from DMAPP and IPP. Write down the mechanistic pathway of the biosynthesis of **germacrene-D** and draw the structures of both the enantiomers of **germacrene-D** indicating the 'R' & 'S' notations. 2+2+1=5



- (b) Write the biosynthetic route of **trans-chrysanthenic acid** from IPP. 2



- (c) Identify 'A', 'B', and 'C' of the following reactions. 3



3. What are lipids? How are they classified? Discuss *de novo* synthesis of Cis-Jasmone and Methyl-Jasmonate from Linolenic acid. 2+3+5=10

4. (a) Show the trans-annular cyclization route in the biosynthesis of **β -caryophyllene** from the cis, trans-farnesyl. 2.5

