

Time: 2 hrs

**N.B.:** All Questions are compulsory.

**Total Marks: 40**

- Q1.** (a) Name two pyrimidine bases present in RNA. (01)  
(b) Name two drugs which inhibit topoisomerase. (01)  
(c) Give role of spliceosomes in RNA splicing. (01)  
(d) Name the initiation codon and its respective amino acid. (01)  
(e) Explain how Chloramphenicol and Streptomycin drugs inhibit protein synthesis. (02)  
(f) Enlist all types of eukaryotic DNA polymerases. (02)

- Q2.** (a) Discuss transcription in prokaryotes. (03)

**OR**

- (a) Give details of promoter regions for initiation of eukaryotic transcription. (03)  
(b) Describe lac-operon. (03)  
(c) Explain Base excision process for DNA repair. (02)

- Q3.** (a) Explain Holliday model for recombination. (03)  
(b) Describe Elongation stage of protein synthesis in bacterial cells. (03)

**OR**

- (b) Differentiate Initiation of translation between prokaryotic and eukaryotic cells with description of the steps for Initiation. (03)  
(c) With a schematic diagram depict Watson-Crick model for DNA structure. (02)

- Q4.** (a) Write note on telomere and telomerase. (03)  
(b) Explain post-translational modifications. (03)

**OR**

- (b) Compare solid phase peptide synthesis with biosynthesis. (03)  
(c) What are mutagens? Give an example of chemical and biological mutagens. (02)

- Q5.** (a) Explain the terms: Unidirectional and bidirectional mode of replication. (02)

**OR**

- (a) Give justification for the statement: 'DNA polymerase III is the principal replication enzyme in E. coli while DNA polymerase II is involved in DNA repair'. (02)  
(b) Discuss SOS DNA repair (02)  
(c) Give the post-transcriptional modifications of mRNA. (02)  
(d) Write a note on Single Nucleotide Polymorphisms. (02)

[ 2 Hours ]

[ Total Marks : 40 ]

Please check whether you have got the right question paper.

- N.B:**
1. All questions are compulsory
  2. Figures to the right indicate full marks.

Q.1 Answer the following: (10)

- a) Give the regulatory requirements for manufacture of eye makeup products.
- b) What are the factors governing formulation of baby products?
- c) Enlist Nail speciality products
- d) What are pearlescent pigments? Give examples.
- e) What is the mechanism of working of hair conditioners?
- f) Distinguish between antiperspirants and deodorants.

Q.2 Answer any two (6)

- a) Vanishing creams are pearlescent and have a slightly acidic pH . Justify .
- b) Elaborate on colours used in cosmetics
- c) Describe any two quality control tests on nail lacquers.

Q.3 Answer any two (6)

- a) Describe the packaging of lipsticks.
- b) Write a note on insect repellants .
- c) Classify surfactants used in shampoos with examples

Q.4 Answer any two (6)

- a) Write on large scale manufacturing of loose face powder.
- b) Enlist various types of shaving products and elaborate on any one.
- c) Give an account of raw materials used in toothpastes.

Q.5 a) Elaborate on methods used for sensorial evaluation of cosmetics (3)

- b) Write 2 in-vitro tests for skin irritation. Discuss sensitivity testing of cosmetic products done on animals. (3)

Q.6 a) Enlists various methods of processing of plant materials used in cosmetics. Explain any one process . (2)

- b) Illustrate the significance of sensorial evaluation for cosmetics. (2)

- c) Give the classification of different depilatory agents. (2)

(2 Hours)

Marks : 40

NB : (1) All questions are Compulsory.

(2) Draw neat labelled diagrams wherever necessary

- Q.1 a How transposition can cause mutations in cells? 2  
 b Explain the two types of mobile genetic elements present in bacteria. 2  
 c What is the importance of horizontal transfer of genetic material in bacteria? 2  
 d What is specialized transduction? 2  
 e Outline the steps for natural transformation in *Bacillus subtilis*. 2
- Q.2 a Distinguish between Prototrophs and auxotrophs. 2  
 b How are F' factors generated? 2  
 c How does a geneticist doing interrupted mating experiments know that the locus for the drug sensitive allele, used to eliminate the Hfr bacteria after conjugation, has crossed into the F- strain? 2
- Q.3 a In a transduction experiment, the donor was  $g^+ e^+ f^+$  and the recipient  $g^- e^- f^-$ . selection was for  $g^+$ . The four classes of transductants from this experiment are given below: 3

| Class | Genetic composition | Number of individuals |
|-------|---------------------|-----------------------|
| 1     | $g^+ e^+ f^+$       | 57                    |
| 2     | $g^+ e^+ f^-$       | 76                    |
| 3     | $g^+ e^- f^-$       | 365                   |
| 4     | $g^+ e^- f^+$       | 2                     |
| Total |                     | 500                   |

- a) Determine the cotransduction frequency for  $g^+$  and  $e^+$ .  
 b) Determine the cotransduction frequency for  $g^+$  and  $f^+$ .  
 c) Which of the cotransduction frequencies calculated in (a) and (b) represents the greater actual distance between the genes? Why?
- b Explain the role of RuvABC complex in resolution of Holliday junction. 3  
**Or**  
 Explain the Holliday model for homologous recombination
- Q.4 a What are plasmids? Explain briefly any 2 types 3  
 b Write a short note on plasmid incompatibility. 3

**Or**

Write the principle and method of isolation of plasmids.

Q.5 a What is artificial transformation in bacteria. Explain two methods for the same. 3

b Write a short note on composite transposons. 3

Or

Integrations are major mechanism for spread of multidrug resistance.

Explain why?

Q.6 a What is catabolite repression? 3

b Explain the regulation of tryptophan operon by attenuation 3

Or

i. Indicate whether for the following genotype,  $\beta$ -galactosidase and permease will be produced or not in the absence and presence of inducer:

| Inducer absent         |          | Inducer present        |          |
|------------------------|----------|------------------------|----------|
| $\beta$ -galactosidase | permease | $\beta$ -galactosidase | permease |

a)  $I^+ P^+ O^c Z^+ Y^-$

b)  $I^- P^+ O^+ Z^+ Y^-$

ii) What is the difference between constitutive gene expression and regulated gene expression?

(2 Hours)

[Total Marks: 40]

- N.B: (1) All the questions are **compulsory**.  
 (2) **Figures** to the **right** indicate full marks.  
 (3) Draw neat labelled sketches wherever necessary

- Q1. a. State what is meant by – primary packaging and secondary packaging. Give two examples of each 1M  
 b. State any two defects observed in glass containers. 1M  
 c. Explain the issues related to biocompatibility of plastics 2M  
 d. Enlist various types of aerosol valves. 1M  
 e. Mention/State basic components of Blister Packs. 1M  
 f. Enlist types of labels 1M  
 g. Give one example of child resistant cap. 1M  
 h. State any two Q.C. tests for paper and paper board. 2M
- Q2. a. Discuss the different types of glass w.r.t. chemical composition. 3M  
 b. Discuss sterilization of plastic containers. 3M
- OR**
- b. Elaborate on sterilization of rubber closures. 3M
- Q3. a. Explain in detail fabrication processes for plastics. 3M  
 b. Describe in detail printing processes of labels 3M
- Q4. a. Elaborate on cans and collapsible tubes for pharmaceuticals. 3M  
 b. Write a note on Packaging and the ICH guidelines 3M
- OR**
- b) Elaborate on photostability testing 3M
- Q5. a. Elaborate on coatings and laminates 3M  
 b. Describe Strip packaging process w.r.t. materials used and machinery. 3M
- OR**
- b) Elaborate on shrink wrapping and stretch wrapping processes in packaging. 3M
- Q6. a. Give the functions of a package. 2M  
 b. Elaborate on ancillary packaging materials. 2M  
 c. Write on elastomeric closures for parenteral products. 2M

[Time: 2 Hours]

[ Marks:40]

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.

- Q.1** Answer the following: **12**
- i) What are functional foods? Give examples.
  - ii) Give limitations of nutraceuticals (any 2)
  - iii) Give the source & structure of Resveratrol.
  - iv) Name one marketed preparation and the therapeutic uses of Curcumin.
  - v) State the role of tocopherol as nutraceuticals.
  - vi) Write the occurrence and use of Glutathione.
  - vii) Give the structure and recommended does of Astaxanthin.
  - viii) Name any 2 processing challenges for liquid oral dosage forms.
  - ix) Give one examples of food-nutraceutical interaction.
  - x) Give any one adverse effect of nutraceutical with suitable examples.
  - xi) What does FPO stand for?
  - xii) Write a pharmacoepial specification for nutraceuticals.
- Q.2** i) Write a note on nutrition and aging. **04**
- ii) Write a note on labeling of nutraceuticals. **03**
- Q.3** i) Discuss adulteration of nutraceuticals. **04**
- ii) Discuss marine nutraceuticals. **03**
- Q.4** i) Comment on AGMARK regulatory aspects for nutraceuticals. **04**
- ii) Write a note on flax Lignans. **03**
- Q.5** i) Discuss the challenges involved in extraction and concentration of nutraceutical constituents. **04**
- ii) Write a note on the occurrence and role of prebiotics and probiotics. **03**

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Time: 2 Hours

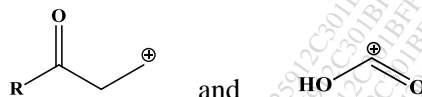
Marks: 40

- N.B.:** 1. All Questions are compulsory  
2. Figures to right indicate full marks

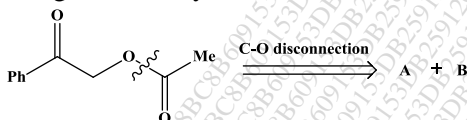
**Q.1.** Answer the following in brief. Draw structures wherever required. **10M**

i. Define: a. Functional group interconversion    b. Synthon **2M**

ii. Suggest suitable synthetic equivalents for the following synthons **2M**

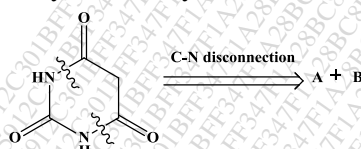


iii. Identify synthon A and B in the given retrosynthesis reaction **2M**

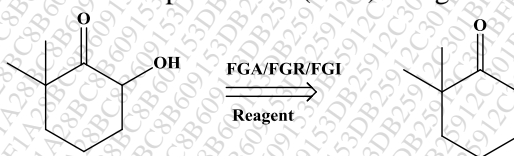


iv. Discuss any two disconnection rules by giving suitable example **2M**

v. Identify A and B in the given heterocyclic retrosynthesis **2M**

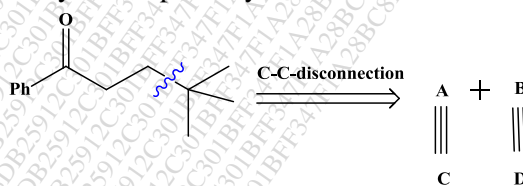


**Q.2.** i. Identify the following conversion as Functional Group Interconversion (FGI) or Functional Group Addition (FGA) or Functional Group Removal (FGR) and give suitable justification **3M**



ii. Suggest the economical and simple retrosynthetic pathway and synthetic scheme for 4-methoxyacetophenone **OR** Ethyl 1,4-diphenylpiperidin-2,6-dione-3-carboxylate **3M**

iii. Complete the following retrosynthetic pathway **4M**

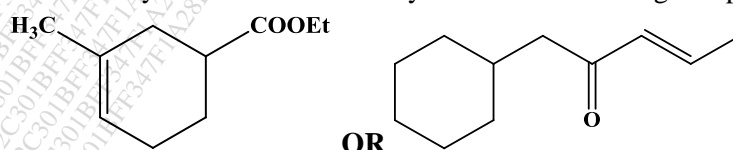


**Q.3.** i. Write the "Order of events" for retrosynthesis of m-nitrochlorobenzene **3M**

ii. Write the retrosynthesis of furan **OR** N-methylpyrrole using "1+4" strategy. **3M**

iii. Discuss the retrosynthetic pathway for Benzocaine **OR** Sulfadiazine **4M**

**Q.4.** i. Suggest a suitable retrosynthetic scheme for any one of the following compounds **3M**



ii. Discuss the term "Umpolung" using suitable example **3M**

iii. Discuss the retrosynthesis of Ibuprofen **OR** Propranolol **4M**