

2018

CHEMISTRY

( Major )

Paper : 6.3

( Organic Chemistry )

Full Marks : 60

Time : 3 hours

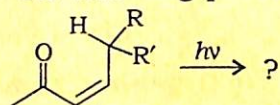
*The figures in the margin indicate full marks for the questions*

1. Answer the following questions : 1×7=7
- (a) What is photostationary state?
  - (b) Mentioning the main source of citral, name one of the methods of extraction of citral from the source.
  - (c) Give the name and structure of a female sex hormone.
  - (d) What is the monomer of Teflon?
  - (e) Write the structure of ala-gly.
  - (f) What is isotactic polymer?
  - (g) Draw the structure of an energy-rich compound in biochemical reaction.
2. Answer any *four* of the following : 2×4=8
- (a) What are essential and non-essential amino acids? Give one example each.



(b) Stating the condition of Norrish type-II reaction, explain why cyclohexanone does not give this type of reaction.

(c) Write down the following product :



(d) What is lysozyme?

(e) Write the structure of adrenaline and mention one of its function.

(f) How will you establish the presence of pyridine in nicotine?

3. Answer any *three* of the following :  $5 \times 3 = 15$

(a) What is special isoprene rule? Plan a synthesis of citral starting from 6-methylhept-3-ene-2-one. Also draw the geometrical isomer of citral.  $1+3+1=5$

(b) What is isoelectric point of amino acids? Mention the use of Sanger's reagent in N-terminal amino acid determination.  $1+4=5$

(c) State and explain Wigner spin conservation rule by taking triplet-triplet energy transfer in photosensitization process. What is optical pumping?  $4+1=5$

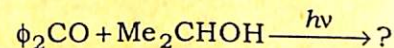
(d) Draw the general structure of the penicillin and discuss the mechanism of action.  $1+4=5$

( Continued )

(e) Draw the structures of the bases present in RNA. 5

4. Answer (a) or (b), (c) or (d) and (e) or (f) :  $10 \times 3 = 30$

(a) (i) Complete the following reaction and write the mechanism :



What is the role of isopropyl alcohol here?  $3+1=4$

(ii) What is glycolysis? Mention the various steps involved.  $1+3=4$

(iii) Write the general mechanism of action of sulpha drugs. 2

(b) (i) Draw the Jablonski diagram to show IC, ISC, F and P. 3

(ii) Name and give the structure of any two antipyretic or analgesic. Write the general mechanism of action of such drugs. 4

(iii) Discuss briefly the effect of denaturation on the structure and activity of protein. 3

(c) (i) Plan a synthesis of the peptide gly-ala. 3

(ii) Explain why most of the photochemical reactions of ketone occur via  $T_1$ -state. 2



- (iii) What is protein? Discuss the various levels of structure of protein. 5
- (d) (i) What is mutarotation in glucose? Draw the  $\alpha$ - and  $\beta$ -anomer of D(+)-glucose in pyranose form and hence explain anomerism. 1+2+2=5
- (ii) Write a short note on biosynthesis of DNA. 3
- (iii) What is nucleotide? Draw the structure of guanylic acid. 2
- (e) (i) Explain why both glucose and fructose reduce Fehling's solution. 2
- (ii) What is the cause of photo-isomerization of olefin? 2
- (iii) How will you prepare paracetamol and sulphapyridine? 3
- (iv) Give example of synthetic rubber and plan its synthesis. 3
- (f) (i) Give the name and structure of a neutral, acidic and basic amino acid. What is zwitterion? 3
- (ii) Describe Watson-Crick model for the structure of DNA. 4
- (iii) What are the fractions of starch? Give the structures. 3

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