

2019

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 : $1 \times 7 = 7$

(a) Define quantum yield. What does it signify in the photochemical reaction?

(b) What is photosensitizer? Give one example.

(c) What is antiretroviral drug? Give one example.

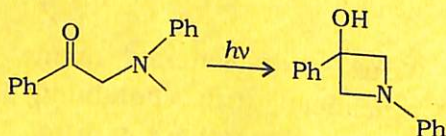
(d) Write the generic name of the anticancer drug containing Pt metal used as chemotherapy drug.

(2)

- (e) What are the three components of a nucleotide?
- (f) Name the enzymes used for digesting proteins.
- (g) Draw the structure of nicotine.

2. Answer any *four* of the following : $2 \times 4 = 8$

- (a) What is quaternary structure of protein? Give two examples of protein with quaternary structure.
- (b) What is Norrish type-I reaction? What are the products expected to obtain when acetone is photolyzed above 100°C ?
- (c) Show the reaction mechanism of the following photochemical reaction. Name the cleavage :



(3)

- (d) What is lignin? What important roles are played by lignins in plants?
- (e) How does lysozyme act as antibacterial agent?
- (f) Write one method of preparation of sulphonilamide.

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

- (a) What are oxyhaemoglobin and deoxygenated haemoglobin? Write the functions of haemoglobin and myoglobin. What is the structural difference between haemoglobin and myoglobin? $2+2+1$
- (b) Name the monomer of natural rubber. Define syndiotactic and atactic polymers. What is plasticizer? Show by reaction the formation of urea-formaldehyde resins. $1+2+1+1=5$

(4)

(c) Give one example of optically inactive neutral amino acid. How can it be prepared by Gabriel's phthalamide synthesis? Define essential and non-essential amino acids with one example of each type. $1+2+2=5$

(d) What are the bases present in DNA? Draw the structures of the bases present in DNA. $1+4=5$

(e) Discuss the mechanism of action of sulpha drugs and penicillin. $2\frac{1}{2}+2\frac{1}{2}=5$

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

(a) (i) What is Paterno-Buchi reaction? Explain with a suitable example to account for the yield of the probable products. $1+3=4$

(ii) What is Krebs' cycle? What are the steps of Krebs' cycle? What is the main function of Krebs' cycle? $1+2+2=5$

(5)

(iii) What is special isoprene rule? 1

(b) (i) What are adrenocortical hormones? What are the main functions of these hormones? Name and draw the structures of any two adrenocortical hormones. $1+2+2=5$

(ii) Explain with examples fluorescence and phosphorescence. $2+2=4$

(iii) What is intersystem crossing (ISC) in photochemistry? 1

(c) (i) Give evidences to ascertain the ring structure of glucose. What are anomers? $4+1=5$

(ii) What is polypeptide? Plan a synthesis of the peptide gly-ala. $1+2=3$

(iii) What is asymmetric synthesis of drugs? Explain with an example. 2

(6)

(d) (i) How are terpenoids classified? Give two examples of monoterpenoids.
What is carotenoid? $1+1+1=3$

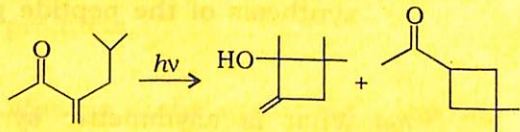
(ii) Discuss the role of RNA in protein synthesis. 5

(iii) Draw the structures of quinine and chloroquine. $1+1=2$

(e) (i) What is the chemical name of vitamin B₃? Give a preparation of the compound. $1+2=3$

(ii) Write the structures and preparations of aspirin and paracetamol. $2+2=4$

(iii) The following photochemical reaction gives two products as shown below :



Provide the mechanism to show the formation of these two products. 3

(7)

(f) (i) What is triglyceride? Write the functions of the lipids in our body.
How is lipid different from fats?
 $1+2+2=5$

(ii) Write short notes on the following :
 $2\frac{1}{2} \times 2 = 5$

1. Glycolysis
2. *cis-trans* isomerization of stilbene on irradiation

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