

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec 2020

Course: B.Sc.(H) Chemistry
Program: Organic chemistry-IV
Course Code: CHEM 3001

Semester: V
Time: 03 hrs.
Max. Marks: 100

SECTION A

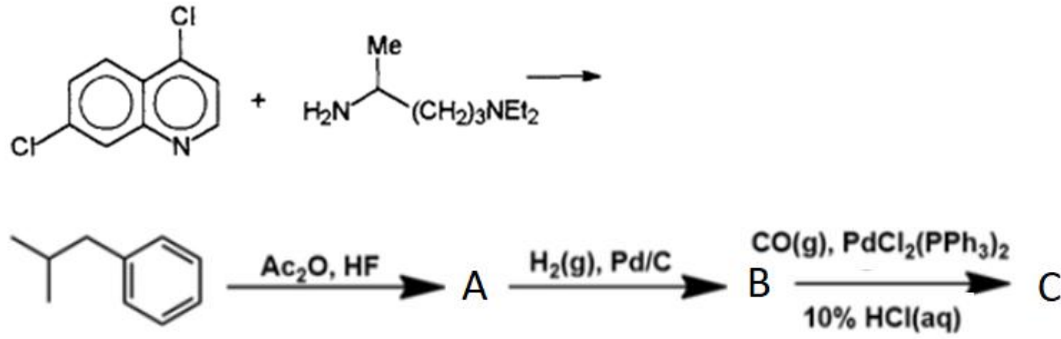
Attempt all the questions

S. No.			Marks	CO
Q 1	A	Nucleotide bases pair in DNA through: (a) hydrogen bonds between complementary bases (b) polar covalent bonds between complementary bases (c) sugar bonds between complementary bases (d) none of the choices	2	CO1
	B	A DNA segment contains 100 Adenine and 100 cytosines, how many nucleotides are present in the segment? (a) 100 (b) 200 (c) 400 (d) 50	2	CO1
	C	The repeating units in both DNA and RNA are called	1	CO1
Q 2	A	Which of the following is true about amino acids? (a) They are constituents of all proteins (b) Alanine having one amino and one carboxylic group (c) Glycine is the only naturally occurring amino acid which is optically inactive. (d) All	2	CO1
	B	Which compound can exist in a dipolar (zwitter ion) structure? (a) $C_6H_5CH_2CH(N=CH_2)COOH$ (b) $(CH_3)_2CHCH(NH_2)COOH$ (c) $C_6H_5CONHCH_2COOH$ (d) $HOOCCH_2CH_2COCOOH$	2	CO1
	C	A dipeptide hasamino acids andpeptide bonds.	1	CO1
Q 3	A	This statement about enzymes is true (a) enzymes accelerate reactions by lowering the activation energy (b) enzymes are proteins whose three-dimensional form is key to their function (c) enzymes do not alter the overall change in free energy for a reaction (d) all of these	2	CO2

	B	Saponification is hydrolysis _____ a) By alkalis b) In digestive tracts of human beings c) By acids d) By salts	2	CO2
	C	Denaturation of protein leads to loss of its biological activity by loss ofstructure.	1	CO2
Q4	A	The 'lock and key hypothesis' mechanism is related with: A. Digestion of fat in the body B. For enzyme specificity C. For the formation of vacuole D. Explosives	2	CO1
	B	What is an apoenzyme? a) It is a protein portion of an enzyme b) It is a non-protein group c) It is a complete, biologically active conjugated enzyme d) It is a prosthetic group	2	CO1
	C	A _____ is a biocatalyst that increases the rate of the reaction without being changed.	1	CO1
Q 5	A	Cleavage of Fructose 1, 6-biophosphate yields _____ a) Two aldoses b) Two ketoses c) An aldose and a ketose d) Only a ketose	2	CO2
	B	Which of the following is not formed during the Krebs cycle? (a) Lactate (b) Isocitrate (c) Succinate (d) Both (a) and (b)	2	CO2
	C	A single molecule of glucose generates _____ molecules of acetyl CoA, which enters the Krebs cycle.	1	CO2
Q6	A	Select the correct statement about Vitamin C (a) It has anti-oxidant property (b) It helps in reconversion of methaemoglobin to haemoglobin (c) Its deficiency causes Scurvy (d) All	2	CO3
	B	Chemotherapeutic agents (a) kill the invading organisms selectively without causing any harmful effect on the host (b) act on various functions of the body (c) Control various metabolic processes (d) Required for maintenance and normal growth of the organism	2	CO3
	C	Chloramphenicol is an example of	1	CO3

SECTION B

Attempt all the questions

Q 7	What are anti-malarial drugs? Give examples. Also, explain their mode of action and side effects.	10	CO3
Q 8	Complete the reactions: 	10	CO3
Q 9	a. An oil undergoes oxidation very rapidly. Which property of the oil, do you feel responsible for that and how will you measure the extent of that property? b. Discuss the double helical structure of DNA.	10	CO2
Q 10	a. Complete the reactions: (i). $\text{H}_2\text{N}-\underset{\text{R}}{\text{CH}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}-\underset{\text{R}'}{\text{CH}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}-\underset{\text{R}''}{\text{CH}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH} \xrightarrow[\text{H}_2\text{O}]{\text{carboxy peptidase}}$ (ii) $\text{NH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{COOH} \xrightarrow{\Delta}$	6+4	CO2
Q 11	a. What are enzymes? How can they be differentiated from chemical catalysts? b. Describe the functions of the following enzymes: i. Transferase ii. Hydrolase	5+5	CO1

SECTION-C

Attempt any one question

Q 12	a. Explain the different types of specificity of enzymes. b. Explain Glycolysis cycle with the help of suitable reactions. Also, calculate the net ATP gain from the process.	6 + 14	CO2
	OR		
	a. Explain two main theories of mode of action of enzymes. b. Explain Citric acid cycle with the help of suitable reactions.	10+10	

