Register Number:……..

KUMARAGURU
college of technology
character is life

B.TECH DEGREE EXAMINATIONS: JUNE 2017

(Regulation 2015)

Second Semester

BIOTECHNOLOGY

U15CHT206**:** Chemistry for Biotechnology

COURSE OUTCOMES

CO1: Outline basic concepts of stereochemistry (K2)

CO2: Discuss the basic concepts of chemistry in amino acid (K2)

CO3: Paraphrase an experiment in required sequence (K3)

CO4: Design a water purifier (K4)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

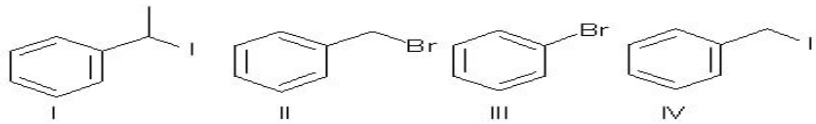
PART A (10 x 1 = 10 Marks)

1. Match each item from the **List I** with **List II** and select one correct combination using the codes given below CO3 [K_2]

List I	List II
A. Excitatory neurotransmitter	i. Electrical problem
B. Western blotting experiments	ii. Tight wrapping of alpha chains
C. Cardiac arrest	iii. L-Aspartate
D. Collagen	iv. Glycine

	A	B	C	D
a)	(ii)	(i)	(iv)	(iii)
b)	(iv)	(iii)	(ii)	(i)
c)	(iv)	(i)	(ii)	(iii)
d)	(iii)	(iv)	(i)	(ii)

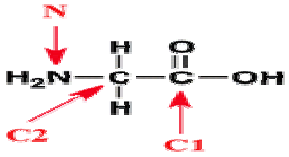
2. Sequence the following in decreasing order of reactivity with methanol CO1 [K_2]



a) III > II > IV >I b) I > IV > II > III

c) I > II > III > IV d) II > III > IV >I

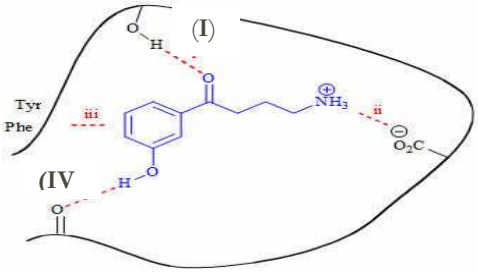
3. Which set of hybridization states of C1, C2, and N of the following molecule is correct? CO1 [K_2]



a) C1 sp^2, C2 sp^3, N sp^3 b) C1 sp^3, C2 sp^2, N sp^3

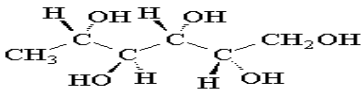
c) C1 sp^3, C2 sp^2, N sp^2 d) C1 sp^2, C2 sp^2, N sp^3

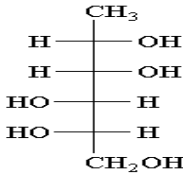
4. In the molecule Identify the binding interactions taking place at I and IV CO1 [K_2]



a) Hydrogen bond, Ionic bond
b) Ionic bond, Covalent bond
c) Hydrogen bond, Hydrogen bond
d) Hydrogen bond, Covalent bond

5. The following stereoisomers are related as CO1 [K_2]





a) Enantiomers
b) Diastereomers
c) Epimers
d) Identical compounds

6. Bacteria prefer to use the codon CGA instead of AGA to code for Arginine. This is an example for CO2 [K_2]

a) Nullomers
b) Second genetic code
c) Transcriptional Decoding
d) Allomers

7. **Assertion (A) :** Colour of Urine a water fluid is pale Yellow CO2 [K_3]
Reason (R) : Breakdown product of haemoglobin from worn out RBC, the Urochrome, imparts color

a) Both assertion and reason are the true statements and reason is a correct explanation of the assertion
b) Both assertion and reason are the true statements and reason is a not correct explanation of the assertion
c) Assertion is true but reason is false
d) Assertion is false and reason is true

8. Consider the following statements regarding phosphoric acid estimation in soft drinks and select the correct code which gives the correct statements? CO3 [K_2]
(i) Problem causing substance in soft drinks is Phosphoric acid
(ii) Ascorbic acid is used in determination of coca-cola as it can complex with the polymolybdates
(iii) In phosphoric acid estimation, Heteropolymolybdate is reduced to penta valent form
(iv) In phosphoric acid estimation Transfer of electrons form Mo(V) to Mo(VI) occurs

a) (i), (ii), (iii), (iv)
b) (iii), (iv)
c) (ii), (iii),(iv)
d) (i), (iii), (iv)

9. Removal of oil and grease from water is invariably done by CO4 [K_2]

a) Carbonate conditioning
b) Colloidal conditioning
c) Aerobic digestion
d) Activated sludge process

10. Lagoons may be used for ---------- of water CO4 [K_2]

a) Aerobic treatment
b) Filtration
c) Skimming
d) Scaling

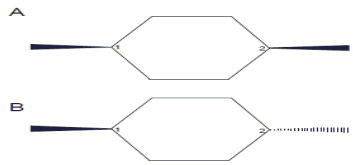
PART B (10 x 2 = 20 Marks)

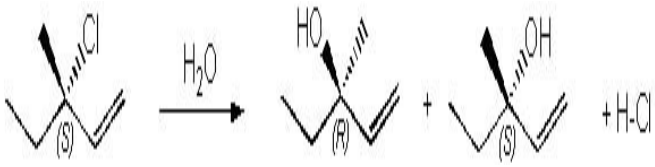
(Answer not more than 40 words)

11. Differentiate between covalent bonding and ionic bonding. CO1 [K_1]

12. With an example explain the mechanism of E2 reaction. CO1 [K_2]

13. Find which type of isomerism is exhibited by the following compounds? CO1 [K_2]



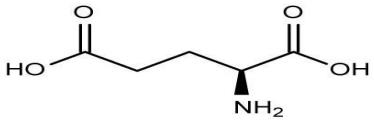
14. 

CO1 [K_2]

Find whether the above reaction follows SN1 or SN2 and justify the answer.

15. With an example state the role of protecting group in protein synthesis CO2 [K_3]

16. From the given L-Glutamic Acid deduce glutamine structure and Classify Glutamine based on CO2 [K_3]
1. Structure 2.Nutrition 3. Metabolic fate



17. State the role of Fluorescein used in Fluorescein Angiography CO3 [K_2]

18. Elucidate the role of cobalt in Vitamin B12 in the human system CO3 [K_2]

19. List the disadvantages of using hard water in industry CO4 [K_2]

20. Draw the break point chlorination curve with proper explanation CO4 [K_2]

Answer any FIVE Questions:-

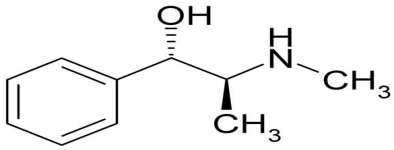
PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

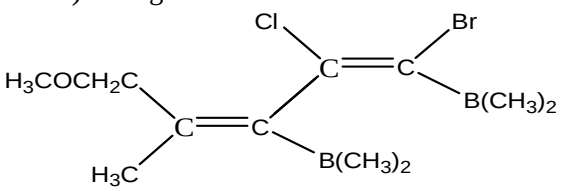
Q.No. 21 is Compulsory

21. (i) Using Cahn Ingold Prelog notation (8) CO1 [K_3]

A) Assign R / S configuration for the following compound and justify the answer.



B) Assign the E/Z notation for the following compound and justify the answer.



(ii) Complete the table given below (6) CO2 [K_2]

S.NO	REACTION	SPECIFIC GROUP IN AMINO ACID	COLOUR
1	Millons reaction		
2	Sakaguchi reaction		
3	Hopkins – Cole reaction		
4	Folin – Ciocalteau's test		
5	Sulfur test		
6	Pauly's test		

22. (i) Define hydrogen bonding and explain the consequences of hydrogen bonding and the anomalies pertaining to water. (8) CO1 [K_3]

(ii) Define hybridization and explain with orbital diagrams the formation of pi and sigma bonds in acetylene (6) CO1 [K_2]

23. Classify isomers with suitable examples CO1 [K_2]

24. (i) Explain transamination process with suitable reactions involving the conversion of glutamine to alanine. (8) CO2 [K_3]

(ii) Write the Strecker synthesis reactions for synthesising an aminoacid. (6) CO2 [K_2]

25. (i) The recent failure of monsoon has necessitated the conversion of hard water to soft water. Explain the desalination process and involving this process, design a water purifier to assist the community in utilization of sea water. (8) CO4 [K_4]

(ii) List the different filtration techniques and With a neat diagram discuss the sand filtration technique used in domestic water treatment. (6) CO4 [K_2]

26. (i) Elucidate the different steps involved in estimation of iodine in iodised salts (8) CO3 [K_3]

(ii) Describe the activated sludge process for water treatment (6) CO4 [K_2]

27. (i) Paraphrase the process of estimation of calcium in milk. (8) CO3 [K_3]

(ii) Anaemia is the general term for having either fewer red blood cells than normal or having an abnormally low amount of haemoglobin in each red blood cell. Red blood cells carry oxygen around the body using a substance called haemoglobin. To detect the condition of anaemia explain the estimation of iron in blood. (6) CO3 [K_3]

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