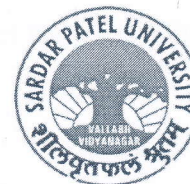


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 VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester IV) Internal Test - 2026
SUBJECT CODE : US04MACHE01
SUBJECT TITLE : ORGANIC CHEMISTRY

DATE : 07-03-2026
DAY : SATURDAY

TIME : 2.45 P.M. TO 4.15 P.M.
TOTAL MARKS: 30

Q.1 Choose and rewrite the correct option for the following.

[6]

- (1) In R-S nomenclature, if four groups attached to chiral carbon are -CHO, -CN, -CH(CH₃)₂ and -CH=CH₂ then highest priority is given to :
 (a) -CH=CH₂ (b) -CH(CH₃)₂ (c) -CN (d) -CHO.
- (2) The compound whose molecules are superimposable on their mirror image even though they contain asymmetric carbon atom is called :
 (a) Meso compound (b) Levo rotatory compound
 (c) Diastereomers (d) Conformational isomer.
- (3) Which of following group is the consider as an auxochrome ?
 (a) -NH₂ (b) -NO₂ (c) -N=N- (d) -N=O.
- (4) Which of following is the common table sugar ?
 (a) Sucrose (b) Fructose (c) Glucose (d) Galactose.
- (5) Glucose and mannose are.....epimer.
 (a) C-1 (b) C-2 (c) C-3 (d) C-4.
- (6) The nucleophilic attack on a acyl compound involves :
 (a) Pentavalent intermediate (b) Tetrahedral intermediate
 (c) Carbocation intermediate (d) Carbanion intermediate.



Q. 2 ANSWER THE FOLLOWING

[6]

- (A) Write sequence rules for R/S nomenclature with suitable example.
- (B) What is 1,3-diaxial interaction ?

OR

[P.T.O.]

Q. 2 ANSWER THE FOLLOWING

[6]

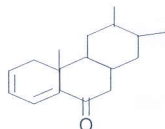
Draw all Newmann formulae resulting from rotation along C₂-C₃ bond of n-butane through 60°. Name all the conformations and arrange them into increasing order of their stability with potential energy diagram.

Q. 3 ANSWER THE FOLLOWING

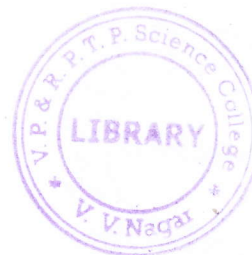
[6]

(A) Give at least **five** applications of UV spectroscopy.

(B) Calculate the $\lambda_{\max}$ of the following compound.



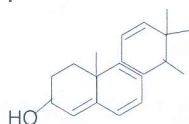
OR



Q. 3 ANSWER THE FOLLOWING

[6]

(A) Calculate the $\lambda_{\max}$ of the following compound.



(B) Discuss detail about various types of electronic transitions and arrange them into decreasing order of energy.

Q. 4 ANSWER THE FOLLOWING

[6]

(A) Prove that glucose is a pyranose not a furanose.

(B) What is reducing sugars? Give at least one name of reducing sugar and non-reducing sugar.

OR

Q. 4 ANSWER THE FOLLOWING

[6]

(A) Explain Ruff degradation.

(B) Explain Kiliani-Fischer synthesis.

Q. 5 ANSWER THE FOLLOWING

[6]

Arrange the decreasing acidity order of following molecules and give **detail** explanation for your answer.

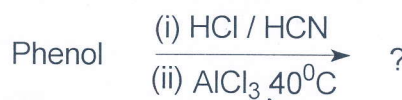
- (a) Alcohol (b) Carboxylic acid (c) Phenol.

OR

Q. 5 ANSWER THE FOLLOWING

[6]

Complete the following reaction and give appropriate detail stepwise mechanism.



THE END

There is no short cut, except hard work with understanding to excel in examination.

Data sheet
Table : Rules for α , β -Unsaturated Aldehydes and Ketones

(2)

λ_{max} for $\pi \rightarrow \pi^*$ transitions ϵ_{max} 4500-20,000 ($\times 10^2 \text{ m}^2 \text{ mol}^{-1}$) $\alpha\beta$ -Unsaturated carbonyl compounds (in ethanol)		
Value assigned to		
β α		
ketones — $\text{C}=\text{C}-\text{CO}-$	acyclic or 6-ring cyclic	215 nm
	5-ring cyclic	202 nm
aldehydes — $\text{C}=\text{C}-\text{CHO}$		210 nm
acids and esters — $\text{C}=\text{C}-\text{CO}_2 \text{ H(R)}$		197 nm
extended conjugation		add 30 nm
δ γ β α		
— $\text{C}=\text{C}-\text{C}=\text{C}-\text{CO}_2$ etc.		
homodiene component		add 39 nm



The structural increments for estimating λ_{max} for a given α , β -unsaturated Carbonyl compound are as follows :

- | | |
|---|--------------|
| (i) For each exocyclic double bond | + 5 m μ |
| (ii) For each double bond endocyclic in
five or seven membered ring except
cyclo-pent-2 enone | + 5 m μ |
| (iii) For each alkyl substituent or ring residue at the | |
| α -position | + 10 m μ |
| β -position | + 12 m μ |
| γ - or δ - or higher position | + 18 m μ |
| (iv) For each double bond extending conjugation | + 30 m μ |
| (v) For a homoannular conjugated diene. | + 39 m μ |
| (vi) Increments for various auxochromes in the various α -, β -, γ - etc. positions are given in
the following Table | |

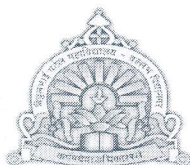
Parent value for Butadiene system or a cyclic conjugated diene	217 m μ
Acyclic Triene	245 m μ
Homoannular conjugated diene	253 m μ
Heteroannular conjugated diene	215 m μ
Increment for each substituent	
Alkyl substituent or ring residue	5 m μ
Exocyclic double bond	5 m μ
Double bond extending conjugation	30 m μ
Auxochrome	
—OR	+ 6 m μ
—SR	+ 30 m μ
—Cl*, —Br*	+ 5 m μ
—NR ₂	+ 60 m μ
OCOCH ₃	

(P.T.O.)

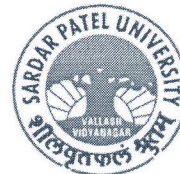
Dr. H.R. MARADIYA V.P. AND R.P.T.P. SCIENCE COLLEGE

Chromophore	Increment in nm (or mμ) for position w.r.t. the carbonyl group			
	α -	β -	γ -	δ - or higher
—OH	+ 35	+ 30	—	+ 50
—OAc	+ 6	+ 6	—	+ 6
—Cl	+ 15	+ 12	+6	—
—Br	+ 25	+ 35	—	—
—OR	+ 35	+ 30	—	—
—SR	—	+ 85	17	31
—NR ₂	—	+ 95	—	—





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Bachelor of Science (Semester IV) Quiz - 2026	
SUBJECT CODE: US04MACHE01	SUBJECT NAME : ORGANIC CHEMISTRY
Date: 07-03-2026	Day : SATURDAY
Time: 20 minutes	Total marks :15
Q-1	Fill in the blanks with appropriate answer given in the bracket. [08]
(i)	10 cm is equal(1 dm, 0.1 dm)
(ii)	 have same physical properties (enantiomer, Diastereomer)
(iii)	 group is the consider as chromophore. (-OH , -N=N-)
(iv)	The effect of the UV radiation on organic compound is to cause..... in molecule. (Bond vibration, Electronic transition)
(v)	A pair of diastereomeric aldoses that differ only in configuration about C-2 are called(Anomers , Epimer)
(vi)	 compound upon enzymatic hydrolysis give equal amounts of D-(+)-glucose and D-(-)-fructose. ((+)-Cellobiose, (+)-Sucrose)
(vii)	reaction is useful to prepare phenolic acid. (Kolbe reaction , Gatterman reaction)
(viii)	Salicylaldehyde can be synthesis by.....(Kolbe reaction, Reimer-Tiemann reaction)
Q-2	Whether the following statement is true or false. Write your answer in the box [07]
(i)	Correct priority order of groups in assigning R/S configuration is -CHO > -OH > -CH ₂ OH > -H []
(ii)	Lactic acid has three stereoisomers. []
(iii)	In carbonyl compound (aldehyde and ketone) $\pi \rightarrow \pi^*$ transition is less intense. []
(iv)	-OH group is the consider as an chromophore. []
(v)	(+)-Sucrose possess mutarotatory property. []
(vi)	(+)-Mannose is a alpha (α)-anomer. []
(vii)	Carbon atom of acyl carbonyl group has SP ² -hybridization. []

THE END