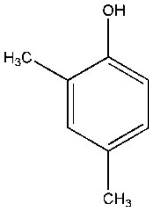
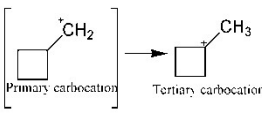
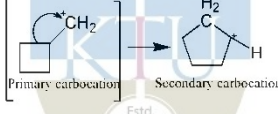
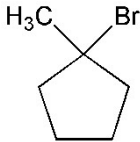
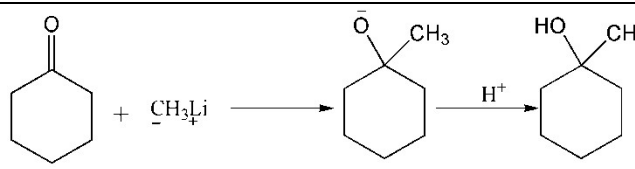


<b>Scheme of Valuation/Answer Key</b> (Scheme of evaluation (marks in brackets) and answers of problems/key)		
<b>APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY</b> THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018		
<b>Course Code: CH207</b>		
<b>Course Name: CHEMISTRY FOR PROCESS ENGINEERING- I</b>		
Max. Marks: 100		Duration: 3 Hours
<b>PART A</b>		
<i>Answer any two full questions, each carries 15 marks.</i>		Marks
1	a) Explanation of each structure (1 mark for each). ( $-H^+$ from structure 1, $-H^-$ from structure 2, $-Cl^-$ from structure 3).	(3)
	b) Generation of Electrophile (1 mark). Illustration of the resonance forms for all the three attacks (3 marks). Explanation of the directing effect (2 marks).	(6)
	c) Aromatic nucleophilic substitution reaction – Elimination-addition mechanism-  Benzyne mechanism-Explanation and Illustration (5 marks). Product (1 mark)	(6)
		
2	a) <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;">  <p>Primary carbocation      Tertiary carbocation</p> </div> <div style="text-align: center; margin-right: 20px;">  <p>Primary carbocation      Secondary carbocation</p> </div> <div style="text-align: center;"> <p>(2 marks)</p> </div> </div> <p>From these rearranged intermediates, either loss of a proton (E1) or attack by the solvent (SN1) gives the observed product. (6 marks)</p>	(8)
	b) Definition (2 marks). Three examples with structures (3×1 marks)	(5)
	c) Definition (1 mark). Structure with explanation of aromaticity (1 mark).	(2)
3	a) Pinacol-pinacolone rearrangement- Detailed mechanism (5 marks).	(5)
	b) Detailed free radical mechanism. Initiation step (2 marks); Propagation steps  Generation of tertiary radical (3 marks) Major product (1 mark)	(6)
		

c)	 <p>CH<sub>3</sub><sup>-</sup> as carbanion (nucleophile) and electrophilic addition on the carbonyl carbon. Explanation and illustration (1+1 marks)</p>	(2)
d)	Definition (1 mark). Singlet and triplet carbenes with electronic representation (1 mark)	(2)

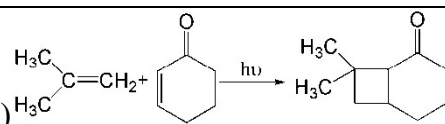
### PART B

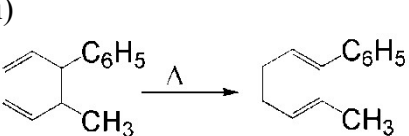
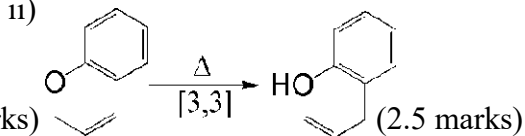
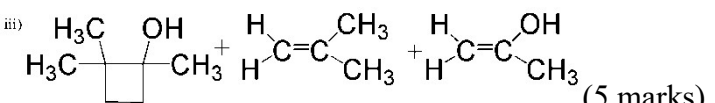
*Answer any two full questions, each carries 15 marks.*

4	a)	D-arabinose is the product formed for both D-glucose and D-mannose when subjected to Ruffs degradation. (3 marks for each)	(6)
	b)	Definition with an example (2.5 × 2 = 5 marks)	(5)
	c)	Definition (2×2 = 4 marks)	(4)
5	a)	Synthesis of Fluorescein dye (1.5 marks) its uses (1 mark). Synthesis of Congo dye (1.5 marks) its uses (1 mark).	(5)
	b)	Definition with help of example (2.5×2 = 5 marks)	(5)
	c)	Definition (2 marks)	(2)
	d)	Definition (1 mark). Two examples with structures (2 marks).	(3)
6	a)	Synthesis (3 marks). Two uses (1 mark for each).	(5)
	b)	i) Gabriel phthalimide synthesis (2.5 marks) ii) Definition with example (2.5 marks)	(5)
	c)	Explanation (1.5 marks). Schematic representation (1.5 marks)	(3)
	d)	Definition-Artificial sweetener (1). Structure (1 marks)	(2)

### PART C

*Answer any two full questions, each carries 20 marks.*

7	a)	Structure of starch – Amylose and amylopectin with explanation (2.5 marks) Structure of cellulose with explanation (2.5 marks). Function of starch (1 mark). Function of cellulose (1 mark). Hydrolysis by acid (3 marks)	(10)
	b)	Definition with example (2.5×2 = 5 marks)	(5)
	c)	 <p>[2+2] cycloaddition (3 marks)</p>	(3)
	d)	Definition with an example (2 marks)	(2)
8	a)	Oxidoreductases, Transferases, Hydrolases, Lyases, Isomerases, Ligases.	(6)

	Explanation with the biological function (Detailed explanation of any three $2 \times 3 = 6$ marks)	
b)	Explanation of photosynthesis in plants with chemical equations (4 marks)	(4)
c)	Definition (1 mark). Explanation with mechanism (4 marks).	(5)
d)	Structure (1 mark). Explanation of the mechanism with a schematic diagram (4 marks).	(5)
9 a)	Description of various steps involved in the drug designing (Understanding the disease to clinical trials-illustration) (8 marks). QSAR approach in drug design (2 marks).	(10)
b)	<p>i)  (2.5 marks)</p> <p>ii)  (2.5 marks)</p> <p>iii)  (5 marks)</p> <p>c) Norrish type II reaction</p>	(10)

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