

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATION

CH 223 – ADVANCED ORGANIC CHEMISTRY

MONDAY 26th OCTOBER 2020 – 8:20 AM

TIME ALLOWED: 2 HOURS

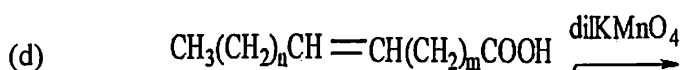
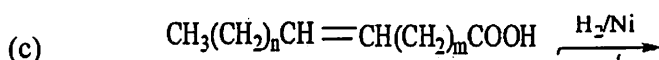
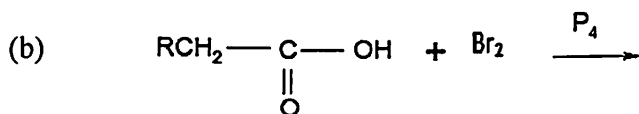
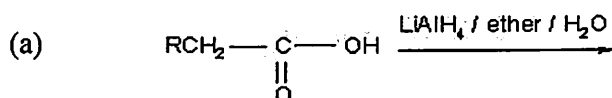
INFORMATION FOR CANDIDATES:-

1. You will have 10 minutes to read the questionpaper. You **MUST NOT** begin writing in the answer book during this time
2. **ANSWER ALL QUESTIONS**
3. All answers **MUST** be written on the answer book provided
4. Calculators are permitted in the examination room. Lecture notes, notebooks plain papers and textbooks are **NOT** allowed
5. Mobile phones are not allowed. **SWITCH OFF THE MOBILE PHONES**
6. Show all workings and calculations in the answer book.
7. **DRAW the STRUCTURES** clear and visible
8. **DO NOT** over write
9. Write your name and number clearly on the front page. **DO IT NOW**

MARKING SCHEME:Total 50 marks

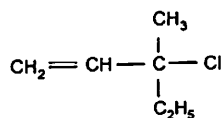
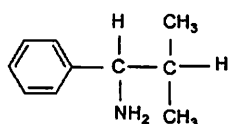
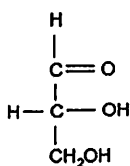
1. Write an equation for the iodination of glycerol trioleate (olein) and calculate the iodine number (given that M.Wt of olein = 884 g/mol and M.Wt of iodine = 254 g/mol). (5 marks)

2. Predict the products in the following reactions:



(5 marks)

3. (a) Write the decreasing priority order of groups attached to the chiral carbon in the following molecules:



- (b) Explain the termination of free radical polymerization of ethylene by disproportionation with suitable equation. (5 marks)

4. Explain the conformational isomers of butane with appropriate structure and compare the stabilization energies of isomers. (5 marks)

5. (a) Explain the physiological functions of the following proteins:
(i) Transport proteins (ii) Hormones

- (b) Write all the possible metameric structures of molecular formula $\text{C}_5\text{H}_{10}\text{O}_2$. (5 marks)

6. Write the name and molecular formula of the monomers used to prepare the following hetero polymers:
- (a) Nitrile rubber
 - (b) Butyl rubber
 - (c) Styrene butadiene rubber
 - (d) Saran
- (5 marks)
7. (a) Explain the differences between glass transition temperature of polyethylene and nylon-6 and give reasons.
- (b) Draw the R and S configurations of the chloriodomethanesulphonic acid
- (5 marks)
8. (a) Explain the chemical behavior of amino acids in dry solid state and in liquid state.
- (b) Distinguish between ionic detergent and non-ionic detergent with ONE example each.
- (5 marks)
9. (a) Write the equation for the laboratory preparation of cis-2-butene from 2-butene.
- (b) Draw the E and Z isomeric structures of 2-hydroxymethyl-2-butenic acid.
- (5 marks)
10. Define the following:
- (a) Isoelectric point.
 - (b) Amphipathic.
 - (c) Amphoteric.
 - (d) Plane of symmetry.
- (5 marks)