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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020**

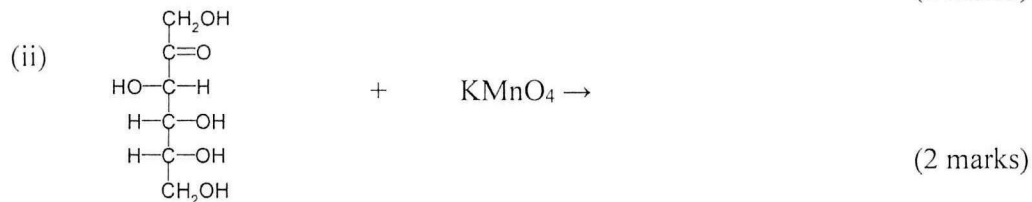
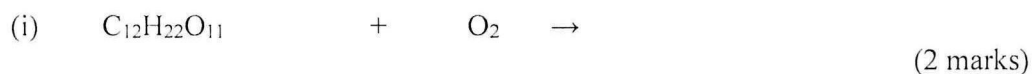
COURSE NAME : FOOD CHEMISTRY AND BIOCHEMISTRY
COURSE CODE : BWD 21203
PROGRAMME CODE : BWD
EXAMINATION DATE : DECEMBER 2019/JANUARY 2020
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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Q1 (a) Suggest the product of the reactions below (balanced equation):



(b) (i) Based on **Figure Q1(b)**, draw phenylalanine (phe) structure in acid and base medium. (2 marks)

(ii) Sketch a dipeptide bond when phenylalanine is linked to form phe-phe-phe protein. (2 marks)

(c) Compare and contrast between caramelization and Maillard reactions. (6 marks)

(d) (i) Describe the differences between saturated and conjugated unsaturated fat. (4 marks)

(ii) Malaysia is the 27th largest oil-producing country in the world. In order to sustain, the vegetable cooking oil from Malaysia must follow certain specifications. Discuss **THREE (3)** physical and **THREE (3)** chemical properties of any vegetable oil available in Malaysia. (6 marks)

Q2 (a) Explain all types of fat-soluble vitamins, their sources and effect of deficiencies. (4 marks)

(b) Suggest vitamin intakes to deficiency cases below:

(i) Small acne-like bumps on arms and thighs. (1 marks)

(ii) Failure to appropriately gain weight despite adequate caloric intake via breastfeeding. (1 marks)

(c) By taking **TWO (2)** examples of minerals, discuss the issues of bioavailability and absorption of minerals in human. (4 marks)

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- (d) Evaluate the data in **Table Q2(d)** and discuss at least **THREE (3)** important conclusions. (6 marks)
- (e) Discuss thoroughly **FIVE (5)** objectives in adding food additives. Include your view as food technologist to sustain the food quality versus the value gained. (10 marks)
- Q3**
- (a) As a Meat Hygiene Inspector, you are responsible for the health mark of animals and the resulting carcass that have undergone ante and post-mortem inspection in order to pass the meat as fit for human consumption.
- (i) Outline a flow chart for post-mortem decision tree that you would use during the assessment. (10 marks)
- (ii) During the inspection, you have found that one of carcasses had a severe non-septic arthritis. Justify your observation. Suggest what you would do to the affected joint. (15 marks)
- Q4**
- (a) Explain **TWO (2)** roles of high molecular weight glutenin fraction in gluten formation and quality. (4 marks)
- (b) (i) Define rennet enzyme. (2 marks)
- (ii) Explain rennet utilization for formation of casein curds. (4 marks)
- (c) Summarize the enzymes involved in cellulose, starch and pectin degradation of fruit and vegetables during storage. (15 marks)

-END OF QUESTION-

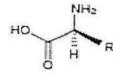
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Amino Acids



General Form

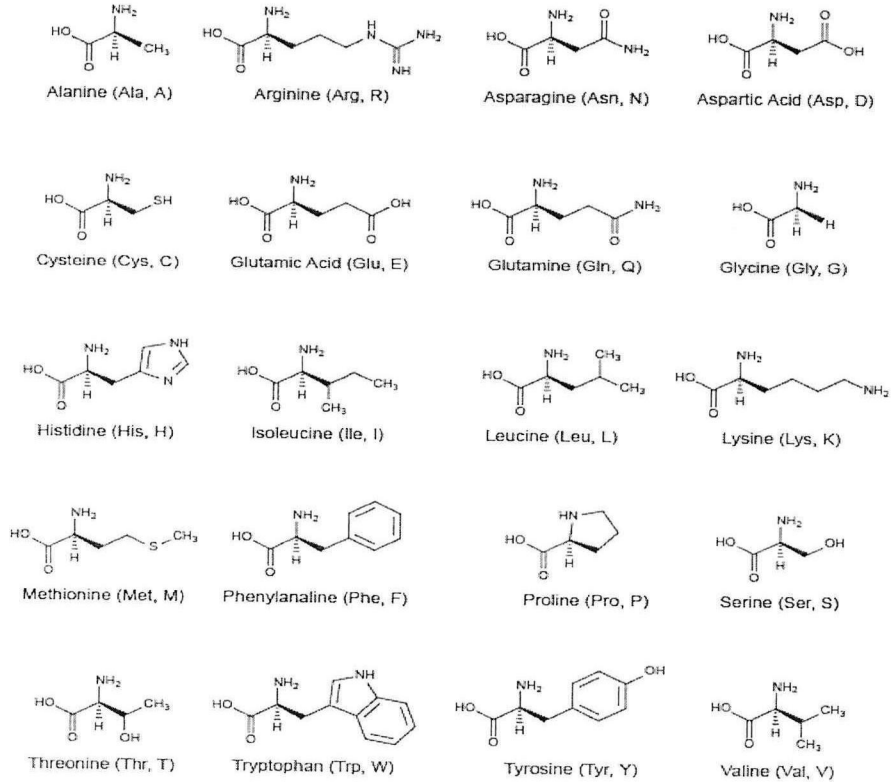


Figure Q1(b) Table of amino acid. Image source: *Food Chemistry 4th Edition by Belitz, W. Grosch, P. Schieberle, Springer-Verlag Berlin Heidelberg (2009)*

Table Q2(d)

Product	Protein (g/100 g)
Meat: beef	16.5
Fish: cod	17.6
Peas	6.3
Beans: dry, raw	22.3
Beans: cooked	7.8

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