

Candidate Name : \_\_\_\_\_

CT Group : \_\_\_\_\_

Index No : \_\_\_\_\_

**PIONEER JUNIOR COLLEGE  
JC 2 Preliminary Examination**



**H2 COMPUTING**

**9754/1**

**PAPER 1**

Thursday

**11 SEPTEMBER 2008**

3 hours

**TIME** 0800h – 1100h

**INSTRUCTIONS TO CANDIDATES**

Do not open this booklet until you are told to do so.

Write your name, CT Group, and Register No. in the spaces provided on this cover page and on your answer scripts.

Attach this cover sheet to Section A.

Submit answers to Section A and B separately.

Answer **all** questions.

**INFORMATION FOR CANDIDATES**

This question paper consists of 3 printed pages (inclusive of this page).

The number of marks is given in brackets [ ] at the end of each question or part question.

The use of an electronic calculator is expected, where appropriate.

You are reminded of the need for clear presentation in your answers.

<b>FOR EXAMINER'S USE</b>		
	Scored	Marks
Section A		50
Section B		50
TOTAL		100

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**This question paper consists of 4 printed pages.**

## SECTION A (50 marks)

- 1 An importer intends to computerise the production of monthly outstanding statements sent office to customers.
- (a) Give **three** reasons why a clear statement of the needs of the task should be produced. [3]
  - (b) State **two** groups who should be consulted in the investigation of this task and for each indicate the information that could be collected. [4]
  - (c) After analysing the manual system, technical documentation is produced. [6]  
What is technical documentation?  
Give examples of what should be included in this documentation, stating the source of the information documented.
  - (d) A batch operating system will be used for the generating of monthly outstanding statements for 2000 customers every month. What is batch operating system? [2]
  - (e) A multi-users operating system was used in the office by a group of office staff. What are the disadvantages for using such system in monthly outstanding statements generation? [2]
  - (f) All computers in the office are allowed to access data from a server located overseas.
    - (i) What may cause errors occur during data transmission? [1]
    - (ii) Why parity check is useful in data transmission? [2]
    - (iii) What is check sum in data transmission? How to use check sum in data transmission? [4]
  - (g) Internet access is not allowed for office staff.
    - (i) What is Internet? [1]
    - (ii) What hardware and software are used for supporting Internet access? [6]
    - (iii) List some reasons why staff is not allowed to access Internet in the office. [4]

- 2 Figure 2.1 shows syntax diagrams that define an unsigned integer and a digit.

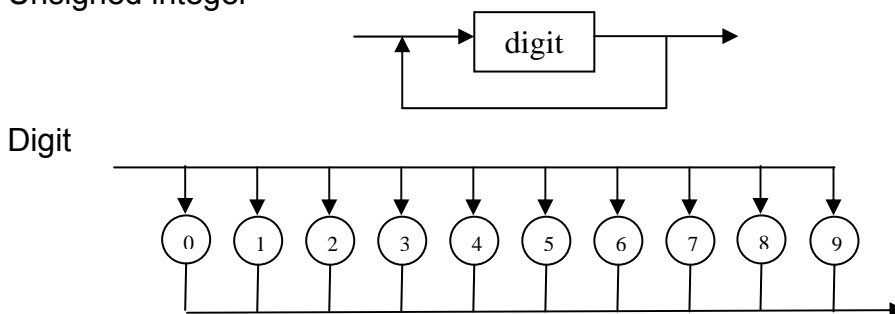


Fig 2.1

In the following questions you may assume the above definitions and you do not need to redraw them.

- (a) Draw a syntax diagram to define an integer, examples of which are 37, +438 and -7234. [3]
- (b) Examples of simple unsigned real numbers are 3.572, 0.912 and 491.0. [2]  
Using the definition of an unsigned integer, draw a syntax diagram to define a simple real number.
- (c) Examples of other real numbers are +32.123, -657.23, 66,661E4, 387.612E+34, and -45.34E-08. Extend you diagram for a simple unsigned real number so as to define all real numbers. [5]
- (d) Create a set of rules in Backus-Naur Form (BNF) to define all real numbers as given in 2(c) [5]

## SECTION B [50 marks]

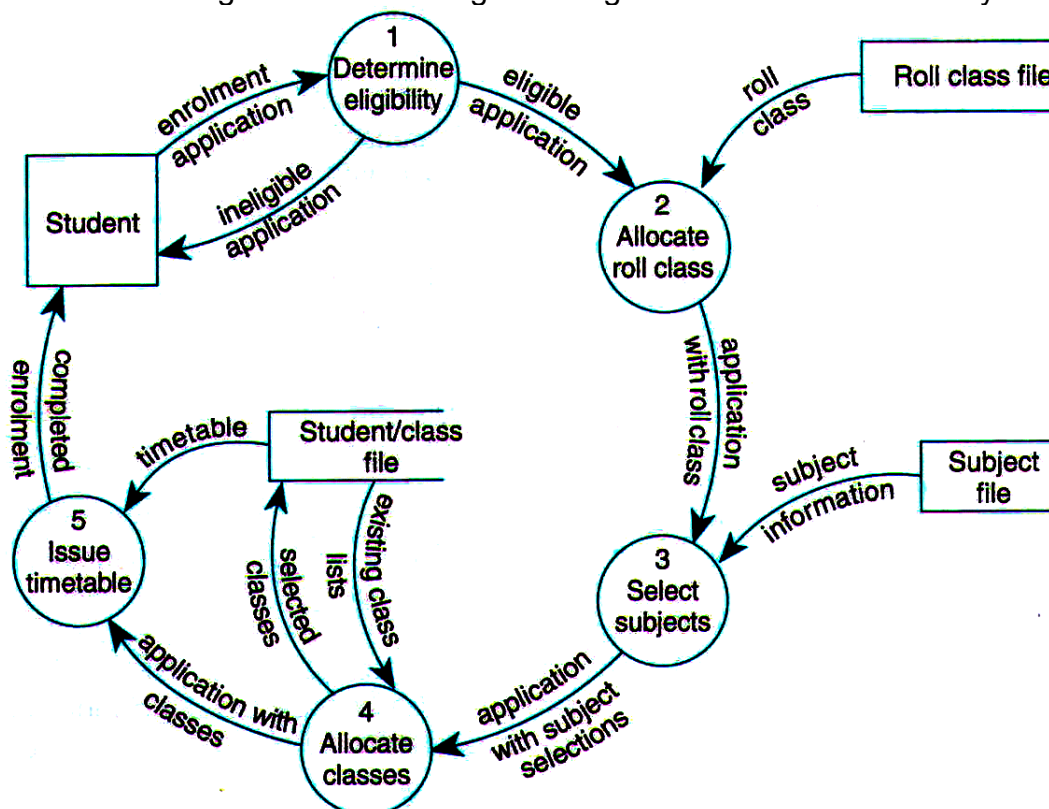
- 3 (a) The decision table below, with redundancies removed, shows the determination of grade in a marking system :

Conditions	Rules		
Mark $\geq 70$	Y	N	N
Mark $\geq 50$ but $< 70$	N	Y	N
Mark $< 50$	N	N	Y
Grade	Action		
Distinction	X		
Pass		X	
Fail			X

[6]

Draw the decision tree and write the pseudocode for the determination of grade process.

- 3 (b) The data flow diagram below the logical design of a school enrolment system:



Write all the processes involved from the time the student fills the enrolment application form until the time he receives the timetable when his enrolment was completed.

[6]

- 4 (a) What is a relational database? [2]  
 (b) List some advantages and disadvantages of using a database instead of a flat file. [4]  
 (c) What is the difference between a primary key and a foreign key used in databases? [2]  
 (d) What are some necessary security measures for protecting a database? [2]  
 (e) Explain the purpose of the following SQL statement:

**SELECT \* FROM Admissions ORDER BY Student\_Number**

[2]

- 5 (a) (i) A binary tree structure is often used to describe the order in which algebraic operations are done in computer or calculator. Why is the structure used? [2]
- (ii) Draw the tree structure to represent  $S = 5 * M - (N \uparrow 3 / T)$  where  $\uparrow$  means "to the power of ". [2]
- (iii) A notation called Reverse Polish is often used in calculators for design reasons. Show the Reverse Polish Notation by performing a traversal on the above tree structure. [2]
- (b) A shop stocks a large quantity of cdroms on computer games. It holds information regarding stock in the form of a binary tree. The information held for each item consist of:
- The part number
  - The quantity in stock
  - The shelf number
- To provide efficient access, the shop wishes to store the information in part number order. Explain, with the aid of a diagram, how the binary tree could be organized. [4]
- 6 (a) Define the term expert system. [2]
- (b) What are the benefits, for an organisation, of using expert systems? [2]
- (c) Explain the functions of the four major parts of an expert system:
- The knowledge base
  - The database
  - The inference engine
  - The user interface
- [4]
- 7 The personnel records for those employees who work in the shop are stored in a linked list in alphabetic order of surname.
- (a) Using a diagram, show the linked list for the employees:  
Ramli , Wong, Bhavani, Govind  
(You should include reference to free space in your diagram) [4]
- (b) With illustration, write an algorithm to search for Tang the linked list. [4]