YISHUN INNOVA JUNIOR COLLEGE
JC 1 PROMOTIONAL EXAMINATION
in preparation for General Certificate of Education Advanced Level
Higher 2

CANDIDATE NAME			
CG		INDEX NUMBER	

H2 COMPUTING **9569/01**
Paper 1 Written **25 Sep 2019**
(SAMPLE PAPER) **1 hour 15 minute**

Additional Materials: Answer Booklet

READ THESE INSTRUCTIONS FIRST

An answer booklet will be provided with the question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper ask the invigilator for a continuation booklet.

Answer **all** questions.

Approved calculators are allowed.

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

The total number of marks for this paper is 100.

[Turn over

1 The following table shows a partial list of Unicode characters, represented in UTF-16 using hexadecimal.

Unicode	Character	Denary Value	Description
U+**03B1**	α	945	Greek Small Letter Alpha
U+**03B2**	β	946	Greek Small Letter Beta
U+**03B3**	γ	947	Greek Small Letter Gamma
U+**03B4**	δ	948	Greek Small Letter Delta
U+**03B5**	ε	949	Greek Small Letter Epsilon
U+**03B6**	ζ	950	Greek Small Letter Zeta
U+**03B7**	η	951	Greek Small Letter Eta
U+**03B8**	θ	952	Greek Small Letter Theta

(a) Explain why the Unicode encoding system has replaced ASCII. [2]

(b) The Greek capital letter Omega, '**Ω**', has denary value 937. Write down its corresponding Unicode. [1]

(c) Write down the 16-bit binary value of the Unicode character ☺ with Unicode U+**263A**. [1]

2 A training agency offers software skills courses and decides to use a relational database to manage its course schedule. The courses run for 1 to 3 days and have multiple re-runs throughout the year. Each course is conducted by one trainer.

CourseCode	CourseTitle	Level	Duration	CourseDate	TrainerName	PhoneNo
001	Excel	Basic	1	21/07/2018	Susan Wong	97896754
001	Excel	Basic	1	01/05/2018 13/07/2018 11/06/2018	Adam Smith	77564563
002	Excel	Intermediate	2	14/05/2018	Adam Smith	77564563
002	Excel	Intermediate	2	01/05/2018	Susan Wong	97896754
003	Excel	Advanced	3	14/08/2018	Lily Goh	87713341
003	Excel	Advanced	3	14/08/2018	Lily Goh	87713341
004	Access	Basic	1	06/05/2018	Lily Goh	87713341
005	Access	Intermediate	2	Null	Null	Null
006	Access	Advanced	3	27/07/2018	Adam Smith	77564563
007	Word	Basic	1	17/06/2018	Susan Wong	97896754

Table 1: Course schedule

(a) Explain whether **Table 1** is in the first normal form (1NF). [2]

Table 1 is split into two tables, the `Course` and `Schedule` tables.

CourseCode	CourseTitle	Level	Duration
001	Excel	Basic	1
002	Excel	Intermediate	2
003	Excel	Advanced	3
004	Access	Basic	1
005	Access	Intermediate	2
006	Access	Advanced	3
007	Word	Basic	1
008	Word	Intermediate	2
009	Word	Advanced	3

Table 2 : `Course` Table

CourseCode	CourseDate	TrainerName	PhoneNo
001	21/07/2018	Susan Wong	97896754
001	01/05/2018	Adam Smith	77564563
001	13/07/2018	Adam Smith	77564563
001	11/06/2018	Adam Smith	77564563
002	14/05/2018	Adam Smith	77564563
002	01/05/2018	Susan Wong	97896754
003	14/08/2018	Lily Goh	87713341
004	06/05/2018	Lily Goh	87713341
006	27/07/2018	Adam Smith	77564563
007	17/06/2018	Susan Wong	97896754

Table 3 : `Schedule` Table

[Turn over

A table description can be expressed as:

`TableName (Attribute1, Attribute2, Attribute3, …)`

The primary key is indicated by underlining one or more attributes.

The foreign key is indicated by dotted underlining one or more attributes.

(b) Give a table description for the `Course` table. [1]

(c) Explain why **Table 3** is not in the second normal form (2NF). [1]

Table 3 is further split into two tables, the `Schedule` and `Trainer` tables:

CourseCode	CourseDate	TrainerName
001	21/07/2018	Susan Wong
001	01/05/2018	Adam Smith
001	13/07/2018	Adam Smith
001	11/06/2018	Adam Smith
002	14/05/2018	Adam Smith
002	01/05/2018	Susan Wong
003	14/08/2018	Lily Goh
004	06/05/2018	Lily Goh
006	27/07/2018	Adam Smith
007	17/06/2018	Susan Wong

Table 4 : `Schedule` Table

TrainerName	PhoneNo
Susan Wong	97896754
Adam Smith	77564563
Lily Goh	87713341

Table 5 : `Trainer` Table

(d) Explain why **Table 2** is not in the third normal form (3NF) and suggest how you will convert it to 3NF. [2]

(e) Draw the entity-relationship diagram for this scenario, showing clearly all the attributes, relations, primary and foreign keys. [3]

(f) By considering the `course` table (**Table 2**) and the `schedule` table (**Table 3**), write the SQL query to find the total number of days that Adam Smith is scheduled to conduct the training in the year 2018. [2]

(g) The agency implements the above relational database using a Database Management System (DBMS).

The firm uses a Graphical User Interface (GUI) for the registration of new courses.

Name **three** types of components that could be used in the registration form and the types of data it is used to capture. [3]

3 When designing an online quiz application, part of the program requires the new user to do the following:

- inputs a User ID
- checks that this User ID has not been used before
- stores the User ID in a binary search tree
- generates the list of User IDs arranged in alphabetical order

(a) The binary search tree has data inserted in the following order.

Raspberry
BarbieDoll
JamesBond
SuperGirl
Jedi
AngBao

Draw the binary search tree. [4]

(b) **(i)** Using the binary search tree, describe how the program could check that a User ID has not been used. [2]

(ii) Using the binary search tree in **part (a)**, describe how the program would provide an alphabetical list of all the User IDs. Include in your description how the list would be obtained from the binary search tree in **part (a)**. [6]

[Turn over

4 A software development company currently hosts its own email server. The company is considering to replace it with webmail service using cloud computing.

(a) State two advantages of this change. [2]

(b) State one disadvantage of this change. [1]

The company is also considering other uses of the cloud. These include collaborative activities between employees of the company and developing of new application software for their clients.

(c) Describe an example of how employees of the company may use the cloud to work collaboratively. [3]

(d) Describe how the cloud can be beneficial to the company when developing new application software for their clients. [4]

END OF PAPER