



Date: 05.06.2014

Time: 1.00 p.m. –4.00 p.m.

Answer **FOUR** Questions **ONLY**.

Q1)

- i. The waterfall model is commonly used for systems development.
 - a. Identify the five (05) phases of the waterfall life cycle.
 - b. State two (02) different types of System Development Life Cycle (SDLC) and identify the phases of them. Briefly describe one of them.
- ii.
 - a. What is the purpose of doing a feasibility study and why is it important in system development?
 - b. Describe three (03) aspects of testing feasibility.
- iii. State the six (06) properties that software should consist of and briefly explain three of them.
- iv. How do CASE tools help in the process of software development?

Q2)

- i. Briefly explain the following terms.
 - a. Data flow
 - b. External Entity
 - c. Process
 - d. Data store
- ii.
 - a. What is a Context Diagram?
 - b. What are the principle rules for drawing context diagram for a given scenario?
- iii. A system is to be built to assist Accounting and Business Information Systems (ABIS) to school administrative staff in the booking of classrooms. A more detailed description of the system is as follows.

The system is to accept classroom booking requests from ABIS administrative staff. When a request is received then it is checked to see that all the required information is included (e.g. date, the details of the course, time and duration of time for which it is required, the number of students, facilities needed and so on). If the request is incomplete or invalid in some other way then an “invalid request” message is sent to the requestor. On the other hand, for a valid request, the booking file is used

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to generate a list of rooms that are available at the required date and time. If no rooms are available at that time, then a booking failure notice is sent to the requestor. If one or more rooms are available, these are then checked to see if it is of sufficient size and have the facilities required. If it does not satisfy the conditions and if there are no rooms suitable, a booking failure notice is sent to the requestor. Finally, if only one room is available then it is booked. If more than one room is available then the room that can accompany the total number of students is selected out of the available rooms and it is booked, and will be the smallest one out of the others. In either case, a booking confirmation notice is sent to the requestor as well as to the course lecturer giving the information about the room that has been booked.

Construct a Context Diagram and level zero Data Flow Diagram for the above class room booking system.

Q3)

- i. What is an Entity Relationship (ER) diagram?
- ii. Explain the following terms.
 - a. Entity
 - b. Entity type
 - c. Attribute
 - d. Relationship
- iii. Give one (01) example for each of the following data relationship complexities.
 - a. One-to-One (1:1)
 - b. One-to-Many (1: M)
 - c. Many-to-Many (M: N)

Draw Entity Relationship Diagrams for each of your examples. Be sure to label data entities, relationships and relationship types.

- iv. A company has employees. An employee has a unique number, a name and a salary. A company has a unique number and a name which is also unique. Draw an Entity Relationship Diagram including attributes and primary keys.

Q4)

- i. What are the three (03) types of decision tables? Describe them by giving examples.
- ii. A description about students grading in Prince and Princess College is given below. Using the information, construct a decision table for the given scenario.

A student may receive a final course grade of A, B, C, D, or F. In deriving a student's final course grade, the instructor first determines an initial or tentative grade for the student, which is determined in the following manner:

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- A student who received a total of not lower than 75 percent on the first three assignments and received a score not less than 70 percent on the fourth assignment will receive a grade of "A".
 - A student who received a total of not less than 75 percent on any two out of the first three assignments and received a score not less than 70 percent on the fourth assignment will receive a grade of "B".
 - A student who received a total of not less than 75 percent on any one out of the first three assignments and received a score not less than 70 percent on the fourth assignment will receive a grade of "C".
 - A student who received a total of less than 75 percent on first three assignments and received a score not less than 70 percent on the fourth assignment will receive a grade of "D".
 - Other score combinations results a grade of "F".

Q5)

- i. What is a decision tree?
- ii. What are the main components of a decision tree?
- iii. There are different entrance rules for different days of the week. Those rules differ among themselves depending on whether it is a national holiday or a non-holiday. Particularly, if you visit on a Saturday which also happens to be a national holiday, do not bother to come because the site is closed. But on other Saturdays you can use the Main Head Quarter (HQ) entrance. If you are visiting on a Sunday, the site is again closed if it is a national holiday. But if not, you should use the Bartlett Avenue entrance for access. If you'd like to pay visit on a regular weekday, use the Anerst Pearst entrance if it is a national holiday, if not use the Main HQs entrance.

Construct a decision tree using the above scenario.

Q6)

- i.
 - a. What is Prototyping?
 - b. What are the advantages and disadvantages of prototyping?
- ii. External Design and Internal Design are types of software design. Write the roles and characteristics of external design.
- iii.
 - a. Why do software designers divide software systems into separate modules?
 - b. Explain the terms *coupling* and *cohesion*. Give the least desirable types of them.

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