



Sri Lanka Institute of Information Technology

B.Sc. Special Honours Degree in IT

**Regular Examination**

Year 1, Semester 2 (2017)

**IT1090 – Information Systems and Data  
Modeling**

December 2017

**Duration: 2 Hours**

**Instructions to Candidates**

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1. This paper is preceded by a **10-minute** reading period. The supervisor will indicate when answering may commence.
2. This paper contains **FOUR (04) Questions** printed on **FIVE (05) pages** including the cover page.
3. Answer **ALL** questions on the **ANSWER BOOKLET** provided.
4. The entire exam is worth **100 marks** and contributes **60%** of the final grade.

### **Question 1**

**[Total: 25 Marks]**

- a) Explain the need for information systems/ information technology in contemporary business organizations. Provide THREE reasons with examples. (6 Marks)
- b) "Not all information generated from an information system is valuable for business decision making." Briefly describe the above statement using TWO characteristics that determine the value of information. (4 Marks)
- c) Identify and explain the type of modern information systems which has both man to machine and machine to machine communication. Your answer should also explain why is it known as machine to machine as well. (4 Marks)
- d) Identify the start and end events, activities, gateways and artifacts of the process given below and model the process flow using standard BPMN. (11 Marks)

Royal City bank issues financial loans to customers. The loan process starts receiving a Loan Application Form (LAF) from a customer. Credit department of Royal City bank checks the documents for completeness. If incomplete, loan request is rejected, customer is notified and process is terminated. Otherwise, LAF is accepted. Next, for all the accepted LAFs, according to the customer's credit worthiness, an appropriate loan amount and the prevailing interest rate is set.

However, if the customer's requested loan amount in the LAF is greater than one million rupees, documents are sent to the legal department for Advanced Validation. If Advanced Validation is passed, then valid documents are forwarded to the manager (credit department) for final approval. However, there is a possibility to fail the Advanced Validation at legal department. Then the loan request is rejected, customer is notified and process is terminated.

If requested loan amount in the LAF is not greater than one million rupees, directly send the documents to the manager of the credit department for final approval. As the final step of this process, credit manager checks all the documents and decides to approve or reject the loan request. If the loan is approved, customer is issued the loan amount and process is terminated. If the loan is rejected, customer is notified and process is terminated.

*Hint: Royal City bank and Customer (Loan requester) can be considered as two different pools of the process.*

## **Question 2**

**[Total: 25 Marks]**

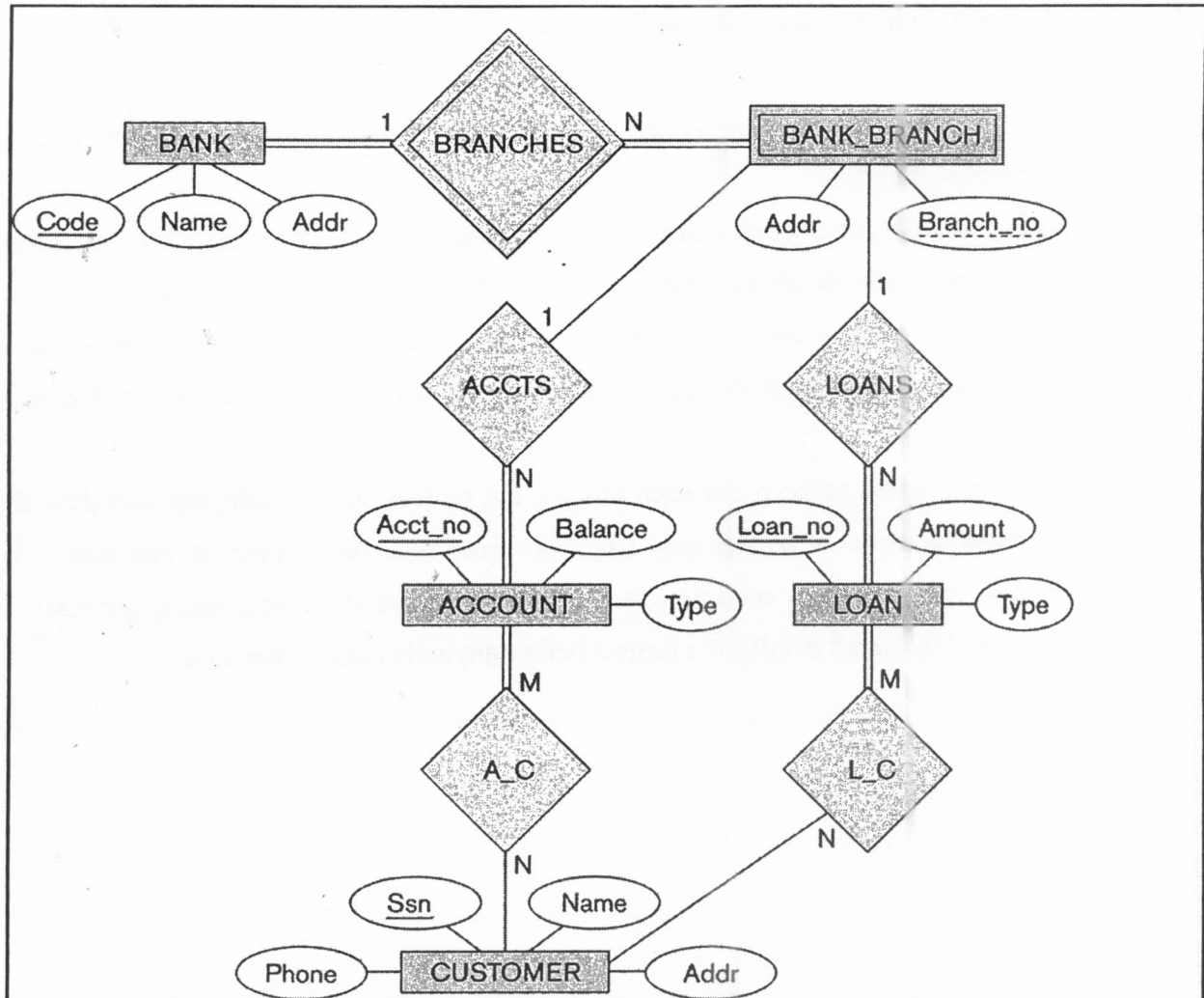
The following requirements are provided to design the database for “**BizWorld**” Company to keep track of their personal and project activity records.

Show the design of your database using the ER model/diagram.

1. For each permanent employee there is a requirement to keep: his/her name, department title and identity code, the department budget code, job title, current projects, names and dates of training courses attended.
2. The training courses are internal courses set up by each department for their own personnel. Training course details should only be recorded if at least one person has attended.
3. In addition there are a number of contract workers who need the following information recorded: his/her name, contract hire company name and address, job title and current projects.
4. There is a requirement to keep, for each project: the project budget code, the start date, the target completion date. A person may work on more than one project at one time. The number of hours worked on each project needs to be recorded for accounting purposes. It would be useful to record details of a project before anybody participates in it.

**Question 3****[Total: 25 Marks]**

Convert the following Entity Relationship (ER) diagram given below to the Relational Model (Schema).



**Question 4****[Total: 25 Marks]**

Consider the following schema:

**Employee** (eid: integer, name: string, salary: real, dno: string)

**Department** (dno: string, dname: string)

**Project** (pid: string, pname: string)

**Works\_on** (pid: string, eid: integer)

The key fields are underlined, and the domain of each field is listed after the field name. The Works\_on relation lists the projects worked by Employees.

Write the following queries in SQL.

- a) Write the SQL statements to create the 'Department' table. (5 Marks)
- b) Find the names of Employees who are working in department of 'Finance'. (5 Marks)
- c) For each Employee list down the number of projects that they have worked on. (7 Marks)
- d) Find the eids and working department names of Employees who has a salary less than the salary of 'John Smith'. (8 Marks)

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