



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**

October 2017

Duration: 2 Hours

Instructions to Candidates

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

Question 1**[Total: 25 Marks]**

- a) Explain the TWO type of end-users you find in an information system with a suitable example for each. (4 Marks)
- b) "Depending on the job role of the employees within the organizational structure the types of information systems used will vary".
Describe the above statement using your knowledge in information systems in business. (6 Marks)
- c) Payment gateways that allow credit card payments, are an essential technology used in many modern Information Systems.
- Identify a type of modern Information System that has payment gateway as an essential component in it. (1 Mark)
 - Briefly explain why payment gateways are essential to such Information Systems. (3 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)

Partial procurement process within a value chain of the MAGA Company, is described below.

Procurement process starts receiving a **Purchase Request Form (PRF)** by the procurement department. Then, the best supplier is selected and the **Purchase Order (PO)** is prepared. **If it is for a foreign purchase**, it is mandatory to get the management approval prior to sending it to the supplier. Such PO can be rejected due to two reasons. If it is rejected due to inappropriate supplier selection, process is repeated again starting from selecting the supplier. If such foreign PO is rejected due to exceeding the budget, the process is terminated. If the approval is given, PO is sent to the supplier and partial procurement process is terminated. **If it is for a local purchase**, PO is directly sent to the supplier with no management approval and partial procurement process is terminated.

Hint: Supplier and MAGA Company can be considered as different pools of the process.

Question 2**[Total: 25 Marks]**

'Knowledge is Wealth' is an emerging university with a high demand. Following requirements are provided by them for you to design the database for their University Management System.

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

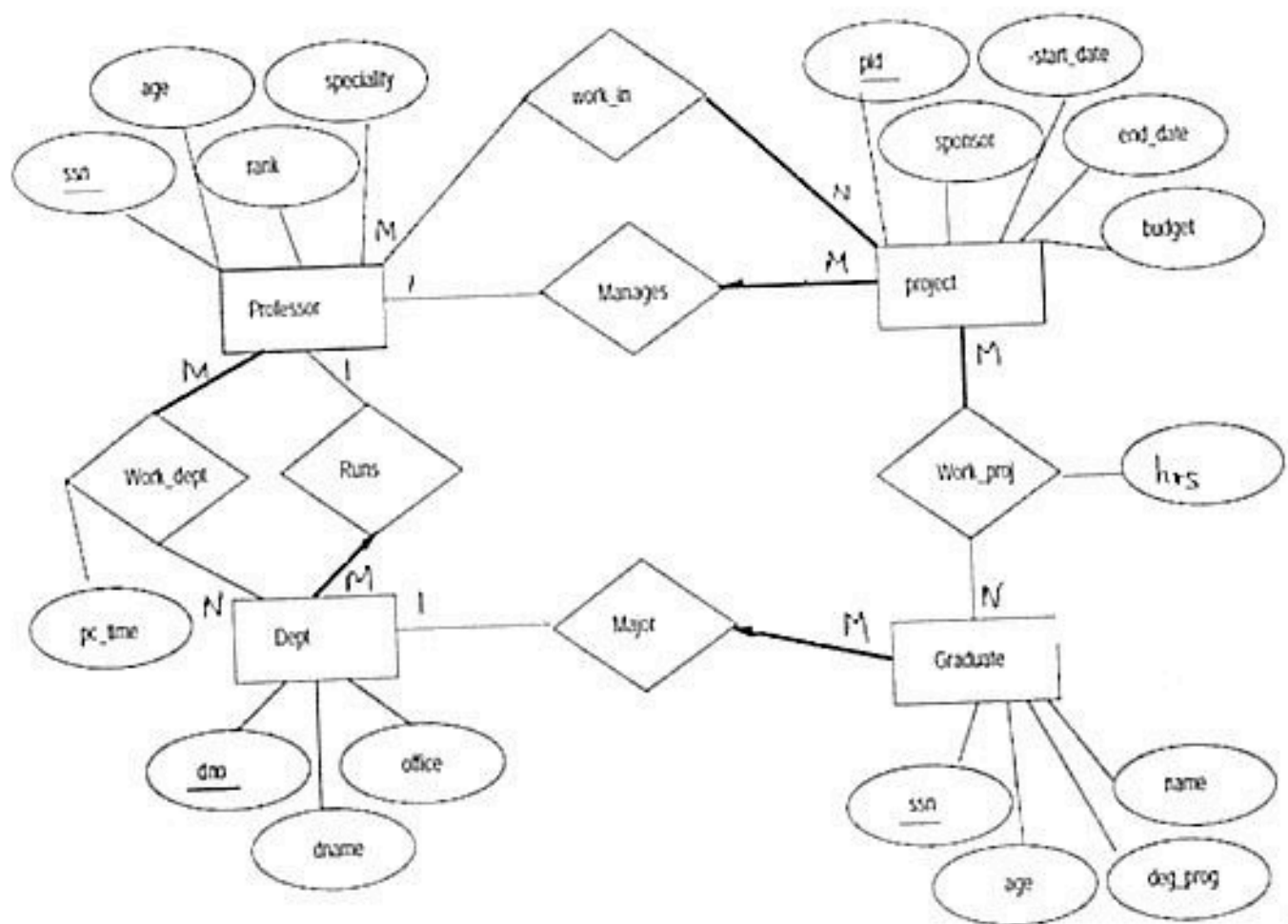
- In an educational institute, there are several departments and students belongs to one of them. Each department has a unique department number, a name, a location, phone number and is headed by a professor.
- Professors have a unique employee Id, name, phone number. They would need to know the following details regarding students: name, unique roll number, sex, phone number date of birth, age and one or more email addresses.
- Student have a local address consisting of the hostel name and the room number. They also have home address consisting of house number, street, city and PIN. It is assumed that all students reside in the hostels.
- A course taught in a semester of the year is called a section. There can be several sections of the same course in a semester; these are identified by the section number. Each section is taught by a different professor and has its own timings and a room to meet.
- Student enroll for several sections in a semester. Each course has a name, number of credits and the department that offer it. A course may have other courses as pre-requisites i.e, courses to be completed before it can be enrolled in.
- Professors also undertake research projects. These are sponsored by funding agencies and have a specific start date, end date and amount of money given. More than one professor can be involved in a project. Also, a professor may be simultaneously working on several projects. A project has a unique projectId.

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

Map the Entity Relationship (ER) diagram given below to the Relational Model.

Identify the **relations** of the schema. Also identify the **attributes/columns**, **Primary Key** and **Foreign Key/s** (if any) for each of the relations in the schema. Using the schema fill the required details in the following table.

(Please draw the given table in the Answer Booklet and write the answers)



Relation	Attributes/columns of the relation	Primary Key	Foreign Key/s	Referenced Relation Name

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

Consider the following schema:

Suppliers(sid: integer, sname: string, address: string)

Catalog(sid: integer, pid: integer, cost: real)

Parts(pid: integer, pname: string, color: string)

The key fields are underlined, and the domain of each field is listed after the field name. Therefore sid is the key for Suppliers, pid is the key for Parts, and sid and pid together form the key for Catalog. The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL.

- Write the SQL statements to create the 'Catalog' table. (5 Marks)
- Find the names of suppliers who supply some red part. (5 Marks)
- Find the sids of suppliers who supply some red part and some green part. (7 Marks)
- Find the pids of the most expensive parts supplied by the supplier named Yosemite Sham. (8 Marks)

---End-of-Paper---