Sri Lanka Institute of Information Technology

B.Sc. Special Honours Degree in IT

Regular Examination

Year 1, Semester 2 (2018)

IT1090 – Information Systems and Data Modeling

June 2018

Duration: 2 Hours

Instructions to Candidates

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) "An Information System is a collection of components that work together to provide information to help in the operations and management of an organization".

Assume that you are been hired to investigate the Library Information Systems at SLIIT.

i. Identify the components of the Library Information Systems at SLIIT. (7.5 Marks)

ii. Identify the types of end-users of the Library Information Systems at SLIIT. (2 Marks)

iii. Explain TWO benefits gained from the Library Information Systems at SLIIT. (2 Marks)

b) Groupware assists teams of people working together through facilities such as email and teleconferencing within or between companies.

i. Identify a type of modern Information System that has groupware as an essential component in it. (1 Mark)

ii. Briefly explain the capabilities of such Information Systems. (2.5 Marks)

c) The description given bellow explains the automated procurement process of Hela Clothing. Model the below procurement process using standard business process mapping. (10 Marks)

Procurement process starts by receiving a purchase request form by the procurement department. The supplier is selected from the supplier database maintained in the procurement department and the Purchase Order (PO) is prepared considering obtained information. It is mandatory to get the management approval if the acquisition to be done from a foreign supplier, prior to sending the order. Such PO can be rejected due to inappropriate supplier selection which results in repeating the process again starting from selecting the supplier. Once the selection is finalized budget allocation is checked which results in terminating the process. If the approval is given, PO is sent to the supplier and the procurement process is terminated. When the purchase is to be done from a local supplier, PO is directly sent to the supplier with no management approval and procurement process is terminated.

Question 2 [Total: 25 Marks]

Draw the ER diagram to model the following real world situation. Your diagram should show entities, relationships, and suitable attributes (including the primary key), and should include 1:1, I: M, N: M labels.

A hospital has a large number of registered physicians. Attributes of physician include Physician ID and specialty. Patients are admitted to the hospital by physicians. Attributes of patient include Patient ID, Patient Name, age and address. Any patient who is admitted must have exactly one admitting physician. A physician can admit any number of patients. Once admitted, a given patient must be treated by at least one physician. A particular physician may treat any number of patients.

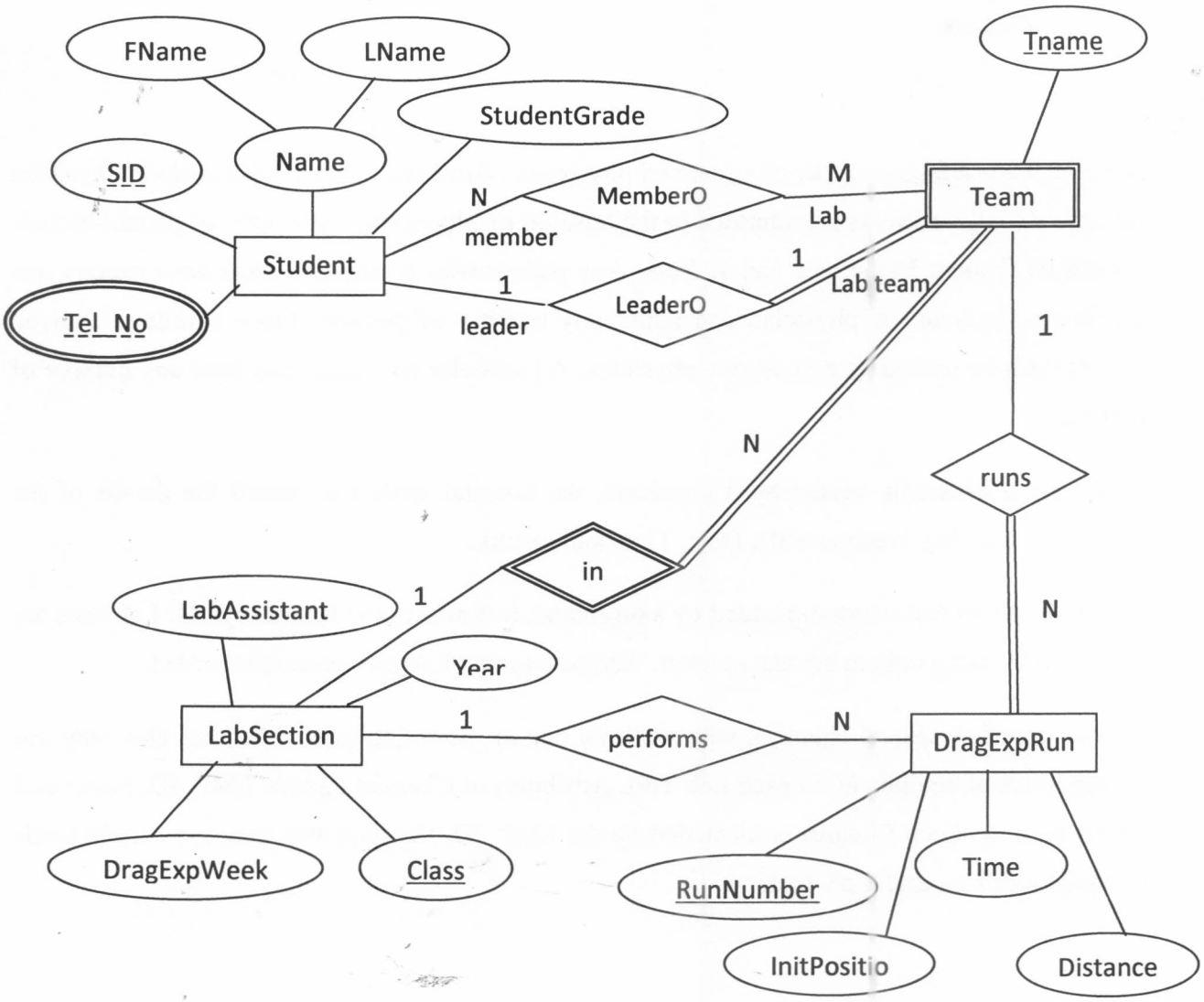
Whenever a patient is treated by a physician, the hospital wishes to record the details of the treatment including Treatment ID, Date, Time and results.

Whenever a Lab test is recommended by a physician, it is sent to the laboratory. All Lab tests are identified by using unique lab test number. Addition to that Lab test name is recorded.

A laboratory has several chemists who work on one or more Lab tests. Chemists also may use certain kinds of equipment on each Lab Test. Attributes of Chemist include EMP_ID, Name and Phone number. Each Chemist is identified by the EMP_ID. Chemist also may use certain kinds of equipment's on each Lab Test.

Question 3 [Total: 25 Marks]

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



Question 4 [Total: 25 Marks]

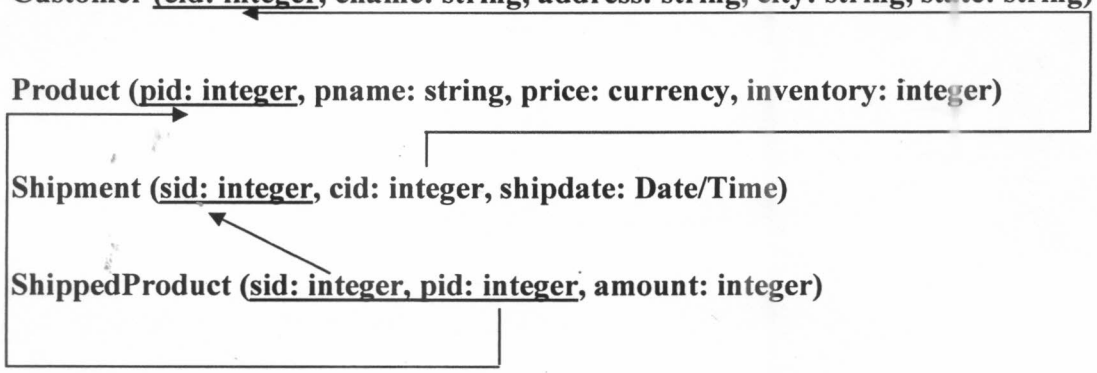
Consider the following schema:

Customer (cid: integer, cname: string, address: string, city: string, state: string)

Product (pid: integer, pname: string, price: currency, inventory: integer)

Shipment (sid: integer, cid: integer, shipdate: Date/Time)

ShippedProduct (sid: integer, pid: integer, amount: integer)



The primary keys are underlined, and the domain of each field is listed after the field name. Write the following queries in SQL.

a) Write the SQL statements to create the 'Customer' relation. (4 Marks)

b) Write the SQL statement to insert the following customer details to the 'Customer' relation. (4 Marks)

cid	cname	address	city	state
100	Amal	Kadawatha	Colombo	Western

c) Find the number of Employees from each state. Display the number of employees and the state name. (5 Marks)

d) Display product names and total amount shipped for products price over Rs.10000. (6 Marks)

e) Find the product ids and names of products with prices greater than price of product id 200. (6 Marks)

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