



**University of Kelaniya – Faculty of Social Sciences  
Academic Year 2017/2018**

**Bachelor of Arts Honors Degree Second Year  
Second Semester Examination, February 2020**

**Social Statistics**

**SOST 32434 - Information Systems and Database Management**

**Answer Four (04) Questions only**

**No. of Questions: 07**

**Time: 03 hours**

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01. i. Briefly explain the characteristics of high quality information. (04 Marks)
- ii. Discuss the main characteristics of an Information Systems (04 Marks)
- iii. Office Automation Systems (OAS) are almost taken for granted in the modern corporate workplace, yet they have a critical role in the management of an organization. Describe, with examples, the importance of an Office Automation System for a business enterprise (04 Marks)
- iv. Describe the two types of Information systems that could be used strategic management in an organization (08 Marks)
02. i. Define the roles and responsibilities of the following system personnel: (08 Marks)
- a) System Owner
  - b) System Designer
  - c) System Builder
  - d) System User

- ii. State the two main characteristics of software process model  
(02 Marks)
- iii. Discuss how both the waterfall model and prototyping model can be accommodated in the spiral process model  
(10 Marks)
03. i. Briefly describe the benefits of using a database system rather than a traditional file system within an organization  
(04 Marks)
- ii. Distinguish between hierarchical, network and relational data models  
(06 Marks)
- iii. Describe ANSI/SPARC Three Tier Architecture under the following headings
- a) The external schema, the internal schema and the conceptual schema  
b) The external/conceptual mapping and the conceptual/internal mapping  
(10 Marks)
04. i. In the context of database design give a precise definition of an Entity Type  
(02 Marks)
- ii. Describe the Insert, delete and update anomaly with suitable example  
(06 Marks)
- iii. Define the three types of data integrity constraints  
(06 Marks)

ii. Following table shows manually recorded information of Doctors' Appointments

Doctor_No	Doctor_Name	Room_No	Location (Hall)	Patient_ ClinicID	Patient_Name	Address
D1	Dr. Jones	1	Deluxe	123	Mrs. Brown	Kandy
D2	Dr. Chin	2	Diamond	234	Mr. Smith	Colombo
D1	Dr. Jones	1	Deluxe	345	Miss. Ball	Galle
D1	Dr. Jones	1	Deluxe	234	Mr. Smith	Colombo
D3	Dr. Peters	3	Jasmin	123	Mrs. Brown	Kandy
D2	Dr. Chin	2	Diamond	345	Miss. Ball	Galle

a) Describe the three stages of normalization to provide 3NF (third normal form)  
(06 Marks)

05. i. Discuss the advantages of flowcharts in program designing  
(06 Marks)

ii. Identify the difference between program flow chart and system flow chart  
(04 Marks)

iii. The commission rate for a salesperson in a given amount of sales are shown below.

Sales	Commission Rate
<= 2000	2%
2001 - 4000	4%
4001 - 6000	7%
> 6000	10%

a) Draw a flowchart to calculate the commission for a salesperson, given amount of sales  
(05 Marks)

b) Write python codes for the above (a) flowchart  
(05 Marks)

06. i. Following tables are taken from a database and two tables contain information about Customer and Orders

Table 1: Customer

Cus_ID	Name	Address	ContactNo	Credit_Limit
0023	K.D.S. Perera	Kandy	xxxxxx	20,000
0045	P.P. Aponsu	Galle	xxxxxx	15,000
0123	L.H. Wishwa	Kandy	xxxxxx	50,000
0567	S.N. Senanayake	Gampaha	xxxxxx	22,000
1156	D.T. Galagedara	Galle	xxxxxx	12,000

Table 2: Order

Order_No	Date	Status	Cus_ID
12	11/01/2020	Dispatched	0023
34	22/01/2020	Ongoing	0045
14	05/01/2020	Ongoing	0567
22	18/01/2020	Dispatched	0023

Using the above database tables write down the SQL codes to,

- Select the customers who are in different cities  
(02 Marks)
- Select the Cus\_ID and Name, whose credit value is less than 20,000  
(03 Marks)
- Update the Status of the Cus\_ID 0045 as "Dispatched"  
(03 Marks)
- Find all the customers who have more than one order  
(03 Marks)

ii. Explain with the aid of suitable examples, the following operators in Relational Algebra

- NATURAL JOIN
- SELF JOIN
- EQUI JOIN

(09 Marks)

07. i. Briefly explain the factors that assist to improve the quality of software  
(04 Marks)

ii. Describe the following terms

- a) Validation and Verification
- b) Top-down and Bottom-up integration testing
- c) Black Box and White Box Testing
- d) Unit testing and Module testing

(16 Marks)

