Total No. of Questions : 7]

SEAT No. : ____

PB3083

[Total No. of Pages : 2

[6257]-101

F.Y. M.Sc. (Computer Applications)

CA -501 MJ : DATABASE SYSTEMS AND SQL

(Credit 2023 Pattern) (Semester-I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7.***
3) ***Questions from Q.2 to Q.7 carry equal marks.***

Q1) Solve any five of the following: **[10]**

a) Define unique Key.

b) Define decomposition.

c) What are the attributes of a cursor?

d) Write the syntax for trigger.

e) What is the view?

f) Explain the levels of abstraction.

Q2) Attempt all. **[12]**

a) What is a cursor? Explain its types.

b) Explain the database architecture in detail.

c) Differentiate between DBMS and RDBMS.

Q3) Attempt all. **[12]**

a) Define attributes. Explain types of attributes.

b) List and explain users of DBMS.

c) Explain the use of Group By and Having Clause.

P.T.O.

Q4) Attempt all. **[12]**

For the questions a and b: Consider the following Entities and Relationships.

Department (dept_no, dept_name, location)

Employee (emp_no, emp_name, address, salary, designation)

Relation between Department and Employee is One to Many

a) Write queries for the following.
   i) Find the total salary of all computer department employees.
   ii) Find the name of a department whose salary is above 10000.

b) Write queries for the following.
   i) add column mobile_no in the employees table.
   ii) Display the maximum salary and employee name of each department.

c) Explain the design issues in the ER Diagram.

Q5) Attempt all. **[12]**

For the questions a, b and c: Consider the following entities and their relatioship.

Client (Client_no, client_name, address, birthdate)

Policy_info (Policy_no, desc, maturity_amt, prem_amt, date)

The relationship between client and policy_info is Many to Many. Write PL/SQL blocks in SQL for the following:

a) Write a function which will return the total maturity amount of policies of a particular client.

b) Write a cursor which will display policy date wise client details.

c) Write a trigger which will fire before insert or update on maturity-amt greater than zero. (Raise user defined exceptions and give appropriate messages).

Q6) Attempt all. **[12]**

a) Explain the advantages of DBMS.

b) Explain the properties of relational decomposition.

c) What is an entity? Explain types of entity sets.

Q7) Write short notes on any Two of the following. **[12]**

a) Generalization and Specialization.

b) Data types in SQL.

c) Index and Views in SQL.

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Total No. of Questions : 7]

SEAT No. : ____

PB-3084

[Total No. of Pages : 2

[6257]-102
M.Sc.
COMPUTER APPLICATIONS
CA-502 MJ: Python Programming and Data Structures
(2023 Pattern) (Semester - I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any five questions from Q2 to Q7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Attempt any Five of the following : **[10]**

a) What is Binary tree?

b) What is the role of indentation in Python?

c) Define Data Structure.

d) List any four features of Python.

e) What.are operations performed on queue?

f) What is recursion?

Q2) Attempt all of the following : **[12]**

a) Explain any four methods in Dictionary.

b) Sort the following elements using bubble sort algorithm.

89 29 39 79 59 49 69 19

c) Write a program to create singly linked list.

Q3) Attempt the following : **[12]**

a) Write a program to reverse a given string using stack.

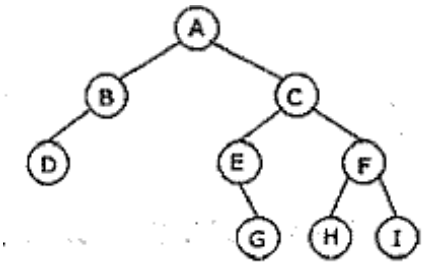
b) Describe the use of filter(), map() and reduce() functions in Python.

c) Explain the types of linked list.

P.T.O.

Q4) Attempt the following : **[12]**

a) Traverse the following tree using preorder, inorder and postorder traversal techniques.



b) Explain the graph traversal methods.

c) Write a Python program to check given number is prime number or not.

Q5) Attempt the following : **[12]**

a) Consider the following adjacency matrix.

	1	2	3	4
1	0	1	1	0
2	1	0	1	0
3	0	0	0	1
4	1	0	0	0

i) Draw the graph

ii) Draw Adjacency list.

b) Write a Python program to print factorial of a given number.

c) How to updating python list?

Q6) Attempt the following : **[12]**

a) Explain the concept of Priority Queue.

b) Explain list comprehension with suitable example

c) What is lambda function? Explain its forms in detail.

Q7) Write short notes on any two of the following. **[12]**

a) Datatypes in Python.

b) Applications of Stack and Queue.

c) Searching techniques

Total No. of Questions : 5]

SEAT No. :

PB-3085

[Total No. of Pages : 2

[6257]-103
M.Sc.
COMPUTER APPLICATION
CA 503 MJ: Operating Systems
(2023 Pattern) (Semester - I)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Attempt/solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***
4) ***Figures to the right indicates full marks.***

Q1) Solve any 5 of the following : **[5]**

a) Define the term waiting time.

b) What is scheduling?

c) When does a page fault occur?

d) What is mean by Virtual File Systems?

e) Define Resource Preemption.

f) Give the different file types?

Q2) Attempt the following :

a) Define fragmentation? List the type of fragmentation. **[2]**

b) Explain in brief following page replacement algorithm: **[4]**

i) Priority scheduling

ii) Round Robin Scheduling

c) Write a note on following: **[4]**

i) General graph directory

ii) Tree structure directory

P.T.O.

Q3) Attempt the following :

a) Write a short note on Interprocess Communication. **[2]**

b) Explain with example best fit, worst fit and first fit. **[4]**

c) Distinguish between process and thread. **[4]**

Q4) Attempt the following :

a) Write a short note on scheduler. **[2]**

b) Explain with example any three file allocation methods. **[4]**

c) What is deadlock? Explain how deadlock can be detected. **[4]**

Q5) Attempt any two of the following :

a) Explain the Architecture of the Linux. **[5]**

b) What is paging? Explain with diagram. **[5]**

c) Explain Deadlock Avoidance with Resource-Allocation-Graph Algorithm. **[5]**

Total No. of Questions : 5]

SEAT No. : [ ]

PB3086

[Total No. of Pages : 2

[6257]-104

First Year M.Sc.

COMPUTER APPLICATIONS

CA-510A MJ : Java Programming

(2023 Credit Pattern) (Semester - I)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any 5 of the following : **[5]**

a) List number of primitive data types in java.

b) Define package in java.

c) Define "this" keyword.

d) Define Extends Keyword.

e) Which component is used to compile, debug and execute the java programs?

f) What is Swing?

Q2) Attempt the following : **[10]**

a) What is class? **[2]**

b) What is the difference between String and StringBuffer? **[4]**

c) Write a java program to check whether given number is prime or not **[4]**

P.T.O.

Q3) Attempt the following : **[10]**

a) What is an instance? **[2]**

b) Write a program to create a set using Collections Framework. Store names of five countries in the set and then display them. **[4]**

c) What is garbage collection in java? Explain finalize method in java. **[4]**

Q4) Attempt the following : **[10]**

a) What is abstraction? **[2]**

b) Explain MVC architecture. **[4]**

c) What is interface? How does it support multiple inheritance in java? **[4]**

Q5) Attempt any two of the following : **[10]**

a) What is an exception? Explain exception handling in java.

b) What is meant by method overloading? Illustrate with a suitable example.

c) Explain Wrapper class with an Example.

Total No. of Questions : 5]

SEAT No. : ____

PB3087

[Total No. of Pages : 2

[6257]-105

First Year M.Sc.

COMPUTER APPLICATIONS

CA 512B MJ : Cloud Computing

(2023 Credit Pattern) (Semester - I)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following : **[5×1=5]**

a) What is private cloud?

b) Write full form of SaaS.

c) What is EBS.

d) Define the term data security.

e) What is Mobile Cloud?

f) What is docker in containerization?

Q2) Attempt the following : **[10]**

a) Explain the term Amazon AWS. **[2]**

b) Explain the features of sales force? **[4]**

c) Explain Comet Cloud. **[4]**

P.T.O.

Q3) Attempt the following : **[10]**

a) What is disaster recovery in cloud? **[2]**

b) What are the advantages and disadvantages of Cloud Computing? **[4]**

c) Explain Security Governance. **[4]**

Q4) Attempt the following : **[10]**

a) What are the benefits of load balancing? **[2]**

b) Explain virtual machines provisioning. **[4]**

c) What are application hosting options in Microsoft Azure? **[4]**

Q5) Attempt any two of the following : **[2×5=10]**

a) Write a note on Multitenant Technology.

b) Write a note on DevOps.

c) Write a note on Hypervisor.

Total No. of Questions : 7]

SEAT No. : ____

PB-3088

[Total No. of Pages : 2

[6257]-106
F.Y. M.Sc. (Computer Applications)
CA-531RM : RESEARCH METHODOLOGY
(2023 Pattern) (Semester - I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any Five questions from 2 to 7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Solve any 5 of the following: **[5 × 2 =10]**

a) Define Research.

b) What are the Objectives of Research.

c) What is Scientific Method of research?

d) Explain Historical Research.

e) What is Hypothesis?

f) What are Plagiarism Tools?

Q2) Attempt the following :

a) Explain the Importance of Research. **[4]**

b) Distinguish between Inductive and Deductive Logic. **[4]**

c) What are Research ethics? **[4]**

Q3) Attempt the following :

a) Explain the Steps in Formulation of Research Problem. **[4]**

b) What are Sampling Techniques or Methods? **[4]**

c) Explain different methods of Data Collection. **[4]**

P.T.O.

Q4) Attempt the following :

a) Explain different types of Quantitative Data. **[4]**

b) Explain various types of Presentation of the Research. **[4]**

c) What is Research Process? **[4]**

Q5) Attempt the following :

a) Distinguish between Scientific Method & Non-Scientific Method. **[4]**

b) Explain Survey in research. **[4]**

c) What is Importance of Formulating a Research Problem? **[4]**

Q6) Attempt the following :

a) What are Characteristics of Good Hypothesis? **[4]**

b) What is Pure and Applied Research? **[4]**

c) Explain the Purpose of Literature Review. **[4]**

Q7) Attempt the following : (Any two)

a) Write short note on Probability and Non-Probability Sampling Methods. **[6]**

b) Write short note on Use of Statistics for Quantitative Data Analysis. **[6]**

c) Write short note on importance of internet in research process. **[6]**

Total No. of Questions : 7]

SEAT No. :

PB3089

[Total No. of Pages : 2

[6257]-201

First Year M.Sc.

COMPUTER APPLICATIONS

CA - 551 - MJ : Web Technologies

(2023 Credit Pattern) (Semester - II)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7.***
3) ***Questions from Q.2 to Q.7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) What is an identifier?

b) Write the purpose of explode( ) and strops( ).

c) List any four tags used in html.

d) State different types of internet protocol?

e) What is $_SERVER variable?

f) What is AJAX Script?

Q2) Attempt the following. **[3×4=12]**

a) Describe Http Request and Response messages. **[4]**

b) Explain CSS with an example. **[4]**

c) Explain Event handling in JavaScript. **[4]**

Q3) Attempt the following. **[3×4=12]**

a) Explain XML Parser. **[4]**

b) Write a PHP script to Design a form to accept a number from the user to check whether number is palindrome or not. **[4]**

(Use the concept of self processing page)

c) Differentiate between indexed versus associative array. **[4]**

P.T.O.

Q4) Attempt the following. **[3×4=12]**

a) State different types of arguments passed to function with example. **[4]**

b) Explain mysqli_connect ( ). **[4]**

c) Write a PHP Script to read book. XML and print book details in tabular format using simple XML. (Content of book. XML are (bookcode, bookname, author, year, price). **[4]**

Q5) Attempt the following. **[3×4=12]**

a) What are the advantages of AJAX? **[4]**

b) Explain Slicing an array in PHP with example. **[4]**

c) Write HTML Code which generates following output. **[4]**

i) Fruits :

- Mango
- Apple
- Orange

ii) Vegatables :

- Tomato
- Potato
- Onion

Q6) Attempt the following. **[3×4=12]**

a) Write a PHP script to display server information in table format (Use $_SERVER). **[4]**

b) Difference between GET and POST method. **[4]**

c) Write a JavaScript program to find factorial of number. **[4]**

Q7) Write short notes on any two of the following. **[2×6=12]**

a) Sticky Forms. **[6]**

b) DOM. **[6]**

c) Maintaining States. **[6]**

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Total No. of Questions : 7]

SEAT No. :

PB-3090

[Total No. of Pages : 2

[6257]-202

M.Sc.

COMPUTER APPLICATION

CA-552 MJ : Introduction to Data Science

(2023 Pattern) (Semester - II)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any five questions from Q2 to Q7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) **Attempt any Five of the following :** **[5 × 2 = 10]**

a) What is ANOVA Test?

b) What is Descriptive Statistics?

c) Define Ratio variable and internal variable.

d) Write any four applications of Data Science.

e) What is Data Preprocessing?

f) What is Exploratory Data Analysis?

Q2) **Attempt all of the following :** **[3 × 4 = 12]**

a) Explain Data Wrangling Process.

b) Briefly explain Lifecycle of Data Science.

c) Explain Central Tendencies with Examples.

Q3) **Attempt the following :** **[3 × 4 = 12]**

a) Calculate the Variance and Standard Deviation of the following score on Exam.

92, 95, 85, 80, 75, 50.

b) What are the reasons for preprocessing data?

c) Give broad overview of the toolbox commonly used by data scientists.

P.T.O.

Q4) **Attempt the following :** **[3 × 4 = 12]**

a) Explain different data visualization techniques.

b) What is Data Transformation? Explain Rescaling with Example.

c) What is structured and unstructured data? Illustrate with examples.

Q5) **Attempt the following :** **[3 × 4 = 12]**

a) Explain Percentiles and Quartiles with examples.

b) Briefly explain five steps of Hypothesis testing.

c) Write common problems associated with unstructured data.

Q6) **Attempt the following :** **[3 × 4 = 12]**

a) How to calculate p-value? Write all the steps.

b) Explain Data Cube aggregation.

c) Write an R program to create Data frames which contain details of 5 employees and display the details in ascending order.

Q7) **Write short notes on any two of the following :** **[2 × 6 = 12]**

a) Proximity Measures.

b) Outliers.

c) Data reduction.

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Total No. of Questions : 5]

SEAT No. :

PB3091

[Total No. of Pages : 2

[6257]-203
First Year M.Sc.
COMPUTER APPLICATIONS
CA-553MJ : Computer Networks
(2023 Credit Pattern) (Semester - II)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions Q.2 to Q.5 carry equal marks.***

Q1) Attempt any five of the following : **[5×1=5]**

a) Define topology.

b) List the layers of the ISO-OSI reference model.

c) What is meant by bit rate and bit length?

d) What are the methods used for framing?

e) What is the size of an IPv4 address and address space?

f) What protocol is used by TCP for flow control?

Q2) Attempt all of the following : **[10]**

a) What is switching? What are its types? **[2]**

b) Differentiate between TCP and UDP. **[4]**

c) What is channelization? Explain any one channelization protocol in detail. **[4]**

Q3) Attempt all of the following : **[10]**

a) What is attenuation? **[2]**

b) Explain the architecture of WWW. **[4]**

c) Draw the structure of the IPv4 datagram and explain its fields. **[4]**

P.T.O.

Q4) Attempt all of the following : **[10]**

a) What is domain name system? **[2]**

b) Explain the token passing mechanism of controlled access. **[4]**

c) Explain multiplexing and demultiplexing in transport layer. **[4]**

Q5) Write short notes on any two of the following : **[2×5=10]**

a) Explain the TCP/IP reference model.

b) Explain ALOHA.

c) Explain classful addressing.

Total No. of Questions : 5] **SEAT No. :**

PB-3092

[Total No. of Pages : 2

[6257]-204
M.Sc.
COMPUTER APPLICATION
CA 560 A MJ: Advanced Java Programming
(2023 Pattern) (Semester - II)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Attempt/solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carries equal marks.***
4) ***Figures to the right indicate full marks.***

Q1) Solve any Five of the following : **[5]**

a) What is JDBC in java.

b) What is ServerSocket and Socket Class?

c) List the phases of JSP Life Cycle.

d) Define thread.

e) List out the Scripting Elements of JSP.

f) What is mean by implicit Objects.

Q2) Attempt the following : **[10]**

a) Explain the Design of JDBC. **[2]**

b) Explain Thread Life Cycle. **[4]**

c) Write a client server program which displays the server machine's date and time on the client machine **[4]**

P.T.O.

Q3) Attempt the following : **[10]**

a) What is GET and POST request? **[2]**

b) Explain two ways of Thread creation **[4]**

c) Write a program to simulate traffic signal using threads. **[4]**

Q4) Attempt the following : **[10]**

a) List out the components of Hibernet **[2]**

b) Explain any two JSP Directives **[4]**

c) Write a JDBC program to display all the countries located in West Region.Create a table Country in database with fields (Name,Continent,Capital,Region) Insert values in the table **[4]**

Q5) Attempt any two of the following : **[10]**

a) Write Short note on Spring Applications. **[5]**

b) Write a program to design a servlet to display "Welcome IP address of client to first time visitor. Display "Welcome back IP address of client" if the user is revisiting the page (Use Cookies. Hint: Use req.getRemoteAddr() to get IP address of Client) **[5]**

c) Explain Types of Drivers in JDBC. **[5]**

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Total No. of Questions : 5] **SEAT No. :**

PB-3093

[Total No. of Pages : 2

[6257]-205
M.Sc.
COMPUTER APPLICATION
CA 562 B MJ: C#.NET
(2023 Pattern) (Semester - II)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Attempt/solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carries equal marks.***
4) ***Figures to the right indicate full marks.***

Q1) Solve any Five of the following : **[5]**

a) Write any four Datatypes in VB.Net.

b) List any two Predefined Dialog Controls.

c) What is array?

d) What is function?

e) List any two validation control.

f) Define Dataset.

Q2) Attempt the following :

a) What is Class and Object? **[2]**

b) Explain InputBox() and MsgBox() with syntax and example. **[4]**

c) Explain server controls in detail. **[4]**

P.T.O.

Q3) Attempt the following :

a) What is Interface. **[2]**

b) Explain Constructors. **[4]**

c) Explain function overloading and function overriding with example. **[4]**

Q4) Attempt the following :

a) What is abstract class? **[2]**

b) Write a C# program to check entered No. is even or odd. **[4]**

c) What is Data Reader and Data adapter in ADO.NET. **[4]**

Q5) Attempt the following.

a) Explain Inheritance. **[5]**

b) Explain in detail Architecture of ASP.NET **[5]**

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Total No. of Questions : 8]

SEAT No. :

PB-766

[Total No. of Pages : 3

[6257]-701

M.C.A. - I (Science Faculty)

COMPUTER SCIENCE

CA - 102 : Database Management System

(Revised 2013) (Semester - I)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Attempt any five questions.***
2) ***Figures to the right indicate full marks.***
3) ***Assume appropriate data if necessary.***
4) ***All questions carry equal marks.***

Q1) **Attempt each of the following :**

a) Write a short note on Level of abstractions. **[4]**

b) What is crash recovery? Explain in detail. **[4]**

c) What is Normalization? List Normal Forms. **[2]**

Q2) **Attempt each of the following :**

a) Write a difference between File Oriented system & Database System. **[4]**

b) Explain ACID properties of transaction. **[4]**

c) State advantages of SQL. **[2]**

Q3) **Attempt each of the following :**

a) What is Serializability? Explain its types. **[4]**

b) Consider the realtion R = (A, B, C, D, E) and Set of FDs defined on R, F as {A $\rightarrow$ B, CD $\rightarrow$ E, A $\rightarrow$ C, B $\rightarrow$ D, E $\rightarrow$ A}. Using above inference rules, compute F^+. **[4]**

c) What is lock? Explain types of locks. **[2]**

P.T.O.

Q4) **Attempt each of the following :**

a) Consider the following relations : **[4]**

Doctor (d_no, d_name, specialization, charges)

Hospital (h_no, h_name, city)

Doctor & Hospital are related with Many to One relationships

Create a relational database in 3NF & solve the following queries in SQL.

i) Display the specialization wise doctor details.

ii) Find the maximum charges of doctor from "City" hospital.

iii) Count the doctors from "Patil" Hospital who are "Eye" Specialist.

iv) Find all the doctors who are works for "Noble Hospital".

b) Define the concept of specialization. Explain with suitable examples. **[4]**

c) Explain Projection Operation with suitable example. **[2]**

Q5) **Attempt each of the following :**

a) Explain Functional Dependency with example. **[4]**

b) What are the advantages and disadvantages of DBMS? **[4]**

c) Define Lossy Join Decomposition. **[2]**

Q6) **Attempt each of the following :**

a) Following is the list of event in an interleaved execution of set T_1, T_2, T_3 & T_4 assuming 2PL. is there a deadlock? If yes which transaction are involved in deadlock? **[4]**

Time	Transaction	Code
t_1	T_1	lock (A, X)
t_2	T_2	lock (B, S)
t_3	T_3	lock (A, S)
t_4	T_4	lock (B, S)
t_5	T_1	lock (B, X)
t_6	T_2	lock (C, S)
t_7	T_3	lock (D, S)
t_8	T_4	lock (D, X)

b) Write short note on : **[4]**

i) 1NF ii) 2NF

iii) 3NF iv) BCNF

c) Define Logical File & Physical File. **[2]**

Q7) **Attempt each of the following :**

a) Explain Immediate database modification technique. **[5]**

b) What is file Organization? Explain any two types with example. **[5]**

Q8) **Attempt each of the following :**

a) Indian Bollywood movie industry is very vast. A movie studio Bharat" wishes to institute a database to manage their files of movies actors and directors. Each actor has appeared in many movies; each director has directed many movies. Each movie has one director and one or more actors. Each actor and directors may have several addresses.

Draw an E-R diagram represented the given scenario. **[5]**

b) Consider the following transactions. Find out any two non-serial schedules which are serializable to a serial schedule < T_1, T_2>. **[5]**

T_1	T_2
read (x)	read (x)
x=x+10	x=x-10
write (x)	write (x)
read (y)	read (y)
y=y+20	y=y-20
write (y)	write (y)
read (z)	
z=z+30	
write (z)	

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