Patuakhali Science and Technology University

4th Semester (Level-2, Semester-II), Final Examination of B.Sc.Engg.(CSE), July-December/2019, Session: 2017-18
Course Code: CCE-221 Course Title: Digital Logic Design
Credit Hour: 3.00 Full Marks: 70 Duration: 3 Hours

[Figures in the right margin indicate full marks. Split answering of any question is not recommended]

Answer any 5 of the following questions.

1. a. Simplify the Boolean function $F=A'B'C'D+ B'CD'+ A'BCD'+ AB'C'$ and implement the resultant using logic gates.   07

    b. "An expression with the minimum number of literals is not necessarily unique"-Illustrate the significance of the above statement with appropriate example.   07

2. a. Simplify the Boolean function $f(w,x,y,z)=\sum(0,1,2,3,4,5,6,8,9,10,11,12,13,15)$.   07

    b. Find the complement of the function $F_1=xyz'+x'y'z'$ and $F_2=x(yz'+yz)$ applying De Morgan's theorem.   04

    c. Prove that $f_1=m_0+m_1+m_6+m_7=M_2.M_3.M_4.M_5$.   03

3. a. Design a BCD-to Excess-5 code converter. The inputs of BCD are A, B, C, D and outputs of excess-5 are w, x, y, z and use only basic gates for implementation.   4

    b. Write down the differences between combinational and sequential circuit. Differentiate between synchronous and asynchronous counter. Which is easier to design?   5

    c. Draw block diagram of BCD adder that is composed of two 4-bit binary adder and external gates. Explain how it manages the BCD addition.   5

4. a. Define decoder. Design a 3-input circuit that will output '1' when the majority of the inputs are 1.   4

    b. Suppose you have some 2 to 4 line decoder. But you need 4 to16 line decoder. How can you built 4 to16 line decoder using your decoders?   5

    c. Design a full-adder circuit with a decoder and two OR Gates. Functions for the sum and carry are as followings :   5

    $$\text{Sum: } S(x, y, z) =\sum(1,2,4,7)$$
    $$\text{Carry: } C(x, y, z) =\sum(3,5,6,7)$$

5.   a. Implement the following boolean function using 4 to 1 multiplexer

$F = \sum(1,3,5,6)$

b. Suppose you have a bit sequence '10011' in register A. Shift the bits to register B and C   5

sequentially. Design the circuit and show the shift sequences.

c. Explain different types of clocked circuit. Draw truth table and block diagram of 4-bit   5

binary parallelmode-10 counter using JK flip-flop.

6.   a.   Design a sequential circuit with two D flip-flops A and B, and one input x_in.   4

When x_in= 0, the state of the circuit remains the same. When x_in= 1, the circuit goes

through the state transitions from 00 to 11, to 10, to 01, back to 00, and repeats.

b. Design a 4-bit parallel load register using a 4-bit simple register, which outputs the stored   5

data in negative edge of clock signal.

c. Draw truth table and block diagram of 4-bit binary ripple counter using JK flip-flop.   5

Patuakhali Science and Technology University

B. Sc. Engg. (CSE) Level-2 Semester II. Final Examination of July-December-2019
Course Code: AES 221   Course Title: Government and Economics
Credit Hour: 3   Full Marks: 70   Time: 3 Hours

(Figures in the right margin indicate full marks. Split answering of any question is not recommended.)

Answer any 5(five) of the following questions.

1. a) Mention the six points demand raised by Bangabandhu Sheikh Mujibur Rahman during six point's movement in Pakistan era.   3.0
    b) Write about the formation of the Mujibnagar government with portfolio in the 1971.   3.0
    c) According to the constitution of Bangladesh, write down your basic human rights divided into different categories.   4.0
    d) Explain comparative conceptual aspects of government and politics.   4.0

2. a) Write the differences between government and governance.   4.0
    b) State what you know about bureaucracy.   3.0
    c) Do you think what there a difference in authority and influence is? If you think then write down the differences.   3.0
    d) Briefly explain the types of legitimacy.   4.0

3. a) Write briefly about the elements of state.   3.0
    b) According to Aristotle, give the idea about six types of traditional government.   4.0
    c) Mention the types of modern governments.   3.0
    d) State the main function of the legislature.   4.0

4. a) Define economics. Discuss the importance of economics.   5.0
    b) Write down the formula of law of demand and supply.   4.0
    c) Discuss the determinants of supply.   5.0

5. a) What is utility? Explain the law of diminishing marginal utility.   7.0
    b) Diagrammatically explain the different types of elasticity of supply.   3.0
    c) What is price elasticity of demand? Suppose the income of a person is BDT. 50000 per month and he purchases ten CDs per month. Let us assume that the monthly income of the consumer increases 20% and the quantity demanded of CDs per month rises to 10%. Calculate the elasticity of demand for CDs.   4.0

6. a) Distinguish between GDP and GNP.   2.0
    b) Write down the income method of measuring national income. Which method is the best?   6.0
    c) Derive the demand curve through a hypothetical demand schedule with assumptions and limitations.   6.0

[Figures in the right margin indicate full marks. **Split answering of any question is not recommended.**
Write the full question number e.g. 4(B)(i) before the answer paragraph]
Answer any 5 of the following questions

1 a. Why information systems are essential in organizations? Distinguish between e-commerce and e-business. — 2+2

   b. Who are the typical stakeholders in an information system? Explain their role. — 2+3

   c. Shortly explain the steps in a system development process? Assume you are a systems analyst who will be conducting a requirements analysis for PSTU central canteen with a point of sale system. Identify who the typical internal and external users might include. — 2+3

2 a. Explain the important skills of a system analyst. — 5

   b. Why do we need to identify the information system architecture? Distinguish between front office information systems and back office information systems. — 2.5+2.5

   c. Define system life cycle. If you were the system owner of an online cloths store, list two business functions of your online store in terms of business events and responses to those events. — 1.5+2.5

3 a. Distinguish between sequential and iterative development. Explain CMM model. — 2+3

   b. Give the basic ideas of RAD strategy. What are the 10 underlying principles for systems development? — 2.5+2.5

   c. What is project? What are the basic project management functions? — 1.5+2.5

4 A a) In system analysis if you use questionnaire as fact finding process which advantages and disadvantages you can get?
      b) How reports differ for different persons and places? — 7

4 B i.   What are the cases where illegal data flows happen?
      ii. Explain the following terms with appropriate example: — 7

            a. Body language.
            b. Spatial zones.

5 A i.   Show with example what are the most common process errors occur when a Data Flow Diagram are drawn for a system.
      ii. Define the followings: — 7

            a) Proxemics
            b) Brainstorming.

5 B i.   How DFD differ from ERD?
      ii. What are the advantages and disadvantages of interviews over other processes? — 7

6 A i.   "A dollar today is worth more than a dollar one year from now"-What is the significance of this statement? Explain with a suitable example. — 7
      ii. What are the significance of database integrity in System Analysis and Design?

6 B i.   "The time value of money is not taken into account for Payback Analysis "- Explain the statement with appropriate example. — 7
      ii. Differentiate between databases and conventional files.

Course Code	Course Title	July-December	Credit: 03
CCE 223	Database System	2019	Time: 03 Hr
			Marks: 70

Answer any 05 out of 06 Questions (Split answers are highly discouraged and write the full question number e.g. 3(A)(ii) before the answer paragraph)

1 A What are advantages of DBMS over traditional file-based systems? What are super, primary, candidate and foreign keys? 03

1 B What is query processor? Describe the three-tier database architecture. 04

1 C Describe the differences in meaning between the term's *relation* and *relation schema*. 03

1 D Consider the following relational schema 04

```
employee(empno, name, office, age)
books(isbn, title, authors, publisher)
loan(empno, isbn, date)
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Write the following queries in relational algebra.
- i.   Find the names of employees who have borrowed a book published McGraw-Hill.
- ii. Find the names of employees who have borrowed all books published McGraw-Hill.
- iii. Find the names of employees who have borrowed more than five different books published McGraw-Hill.
- iv. For each publisher, find the names of employees who have borrowed more than five books of that publisher.

2 A. Define DDL and DML. Write down the basic SQL domain type. 03

2 B. Consider the "Customers" table of a sample database: 11

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen	Luleå	S-958 22	Sweden

Write down the SQL statements for the following conditions

- i.   Selects the "CustomerName" and "City" columns
- ii.   Selects ALL (including the duplicates) values from the "Country" column
- iii. Selects all the customers from the country "Mexico"
- iv.   Select all records where the City column has the value "Berlin"
- v.   Selects all fields from "Customers" where country is "Germany" AND city is "Berlin"
- vi.   Selects all fields from "Customers" where country is NOT "Germany"
- vii. Selects all customers from the "Customers" table, sorted by the "Country" column
- viii. Inserts a new record in the "Customers" table
- ix.   Lists all customers with a NULL value in the "Address" field
- x.   Update the City column of all records in the Customers table
- xi.   Deletes the customer "Alfreds Futterkiste"

3. A Explain the concept of ACID properties in DBMS? List two reasons why null values might be introduced into the database. 03

3 B Consider the Customer Table of 2(B) and Order Table of the following 08

OrderID	CustomerID	EmployeeID	OrderDate	ShipperID
10308	2	7	1996-09-18	3
10309	37	3	1996-09-19	1
10310	77	8	1996-09-20	2

Write down the SQL statements for the following conditions

   i.   selects all orders with customer and shipper information (inner join)

   ii.   select all customers, and any orders they might have (left join)

   iii. selects all customers, and all orders (Full outer join)

   iv.   selects matches customers that are from the same city (Self join)

   C What are the purposes of report generators? Discuss about web interfaces to databases. 03

4 A UGC wants to give scholarship to some students on the following criteria: 07
   i.   Students must be female
   ii.   Student do not get any other private scholarships such like DBBL (Dutch-bangla bank Ltd.) scholarship
   iii. Grade must be at least 3.50
   iv.   Student should not be punished for any awful activity

Create necessary table (yourself) and write necessary query for i, ii, iii and iv.

4 B Define weak entity set. Describe weak entity set with a suitable example. 7

5 A Describe each line of the following *Trigger* in *Oracle*. 7

> i.   *create or replace trigger BOOKSHELF_BEF_UPD_ROW*
> ii.   *before update on BOOKSHELF*
> iii. *for each row*
> iv.   *when (new.Rating < old.Rating)*
> v.   *begin*
> vi.   *insert into BOOKSHELF_AUDIT*
> vii. *(Title, Publisher, CategoryName,*
> viii. *Old_Rating, New_Rating, Audit_Date)*
> ix.   *values*
> x.   *(:old.Title, :old.Publisher, :old.CategoryName,*
> xi.   *:old.Rating, :new.Rating, Sysdate);*
> xii. *end;*
> xiii. */*

5 B What is normalization? Describe different types of normalization with appropriate example. 7

6 A 7
   i.   What is *Triggers*? What are the types of *Triggers*?
   ii.   If you want to *Lock* after four consecutive failed connection attempts to the 'MASUD' account, what will have to do in *Oracle* for this?

6 B What are the different types of attributes? Explain with suitable example. 7