1. a) What is political ideology? 3.0
   b) What do you mean by authority? State the comparative picture between 6.0
      traditional, charismatic and legal rational authority.
   c) Briefly discuss about the seven characteristics of a nation. 5.0

2. a) What are the differences between power and authority? 4.0
   b) Differentiate the main dimensions of government and governance. 5.0
   c) Narrate the sources of political legitimacy. 5.0

3. a) What are the eight elements or the roots of nationalism? 4.0
   b) Mention the types of traditional and modern government according to Aristotle 5.0
      and Leacock.
   c) Discuss the functions of legislature. 5.0

4. a) Define Indifference curve with its assumptions. 4.0
   b) State the characteristics of an indifference curve with necessary figures. 4.0
   c) Define budget line. Suppose that the consumer has a Budget of Tk. 100. The 3.0
      Price of Mango is Tk. 20 and Price of Apple is Tk.10. Draw a budget line with
      these parameters.
   d) Explain the consumer's equilibrium with indifference curve & budget line. 3.0

5. a) Define supply and law of supply. 3.0
   b) Differentiate between supply schedule and supply curve with figure. 3.0
   c) Suppose that an individual's demand function for commodity X is $Qd_x=8-2P_x$. 2.0
      By substituting various prices of X into this demand function, we get the
      individual's demand schedule shown in the Table. Prepare an individual
      demand curve from the schedule.

P_x (Tk.)	8	7	6	5	4	3	2	1	0
Qd_x	0	1	2	3	4	5	6	7	8

   d) Explain the factors affecting demand and supply of a commodity with examples. 6.0

6. a) Differentiate between price elasticity and income elasticity of demand. 3.0
   b) Discuss the numerical method of measuring price elasticity of demand with 5.0
      mathematical example in each case.
   c) Classify goods on the basis of income elasticity of demand. 2.0
   d) When income of a consumer is Tk. 4000 and his demand of a product is 100 kg. 4.0
      If income rises to Tk. 5000 its demand falls to 80 kg. Calculate the income
      elasticity and comment on the type of goods.

....

Patuakhali Science and Technology University

4th semester (L-2, S-II) Final Examination of B.Sc. in Engg. (CSE), July-Dec-2021, Session: 2019-20

Course Code: MAT-221, Course Title: Mathematics-IV

Marks-70, Time: 3 hours, Credit: 3.00

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

Answer any 5 of the following questions.

1. a) Write down the applications of Fourier series in the field of CSE. 02
   b) Define Fourier series for even and odd functions and also write it in the complex form. 04
   c) Find the Fourier series for the following function: 08

$$f(x) = \begin{cases} -1, & when \ -\pi < x < -\dfrac{\pi}{2} \\ 0, & when \ -\dfrac{\pi}{2} < x < \dfrac{\pi}{2} \\ 1, & when \ \dfrac{\pi}{2} < x < \pi \end{cases}$$

and hence prove that $\dfrac{\pi}{4} = 1 - \dfrac{1}{3} + \dfrac{1}{5} - \dfrac{1}{7} + \ldots$

2. a) Explain the Fourier integral and Fourier transform. 03
   b) Find the Fourier integral of the function: $f(x) = \begin{cases} 0, & when \ x < 0 \\ \dfrac{1}{2}, & when \ x = 0 \\ e^x, & when \ x > 0 \end{cases}$ 06

   c) Derive the finite Fourier sine transform of the function : $F(x) = 2x, \ 0 < x < 4$ 05

3. a) Illustrate the uses of Laplace transformation in various fields. 02
   b) State three properties of Laplace transformation. 02
   c) Evaluate: $L^{-1}\left[\dfrac{1}{s^2(s^2+4)}\right]$ by using the convolution theorem. 04

   Applying the Laplace transformation solve the following ordinary differential equation 06

   d) $\dfrac{d^2Y}{dt^2} + 9Y = \cos 2t, \ Y(0) = 1, \ Y(\dfrac{\pi}{2}) = -1$

4. a) Define analytic function. 02
   b) State and prove the necessary condition of the Cauchy-Riemann equations 06
   c) Find the conjugate harmonic function of $u = e^{-x}(x\sin y - y\cos y)$. 06

5. a) Define singular point. 02
   b) If $f(z)$ is analytic for all points inside of C and connected a simple closed curve C. a is 05

   any point inside C. Then $f(a) = \dfrac{1}{2\pi i}\oint_c \dfrac{f(z)}{z-a}dz$.

   c) Evaluate: 05

   i) $\oint_c \dfrac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)}dz$, where C is the circle $|z| = 3$.

ii) $\oint_{c}\dfrac{ze^{tz}}{(z+1)^{3}}dz$, where C is the circle.

02

d) State Cauchy's inequality.

06

6. a) Let $f(z)$ be analytic inside and on a simple closed curve C except at a finite number of singular points $a_1, a_2, a_3, \ldots\ldots\ldots\ldots, a_n$, then

$$\oint_{c} f(z)dz = 2\pi i[\operatorname{Re} s(a_1) + \operatorname{Re} s(a_2) + \ldots\ldots\ldots\ldots + \operatorname{Re} s(a_n)].$$

02

b) Find the residue of $f(z) = \dfrac{e^{z}}{(z-\pi i)^{2}}$.

06

c) Evaluate the contour integration $\displaystyle\int_{0}^{2\pi}\dfrac{d\theta}{a+b\cos\theta}$

Dept. of Computer and Communication Engineering
Faculty of Computer Science and Engineering
Patuakhali Science and Technology University
Dumki, Patuakhali-8602, Bangladesh

Final Examination of B. Sc. Engineering in CSE Level: 2 Semester: II Session: 2019-2020

Course Code	Course Title	July-December	Credit: 03
CCE-221	Digital Logic Design	2021	Time: 03 Hr
			Marks: 70

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

1. [A.] Simplify the Boolean function $F=A'B'C'D+ B'CD'+ A'BCD'+ AB'C'$ and implement the resultant using logic gates. — 7

   [B.] a) Find the complement of the function $F_1=xyz'+x'y'z'$ and $F_2=x(yz'+yz)$ applying De Morgan's theorem. — 7

   b) Prove that $f_1=m_0+m_1+m_6+m_7=M_2.M_3.M_4.M_5$.

2. [A.] Simplify the Boolean function $F(w, x, y, z) = \Sigma(1, 3, 7, 11, 15)$ which has the don't-care conditions $d(w, x, y, z) = \Sigma(0, 2, 5)$ show "An expression with the minimum number of literals is not necessarily unique". — 7

   [B.] Simplify the Boolean function $f(A, B, C, D) = \Sigma (0,1,2,3,5,7,8,10,12,13,15)$ using the tabulation method. — 7

3. [A.] It is necessary to multiply two binary numbers, each two bits long, in order to form their product in binary. Let the two numbers be represented by $a1$, $a0$ and $b1$, $b0$, where subscript 0 denotes the least significant bit. — 2

   i. Determine the number of output lines required.

   ii. Find the simplified Boolean expressions for each output.

   [B.] Define universal gate. Design a 4-bit parity checker. — 3

   [C.] Design a BCD-to-seven-segment decoder in a combinational circuit that accepts a decimal digit in BCD and generates the appropriate outputs for selection of segments in a display indicator used for displaying the decimal digit. The seven outputs of the decoder (a, b, c, d, e, f, g) select — 7
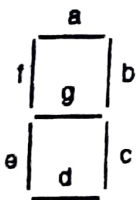

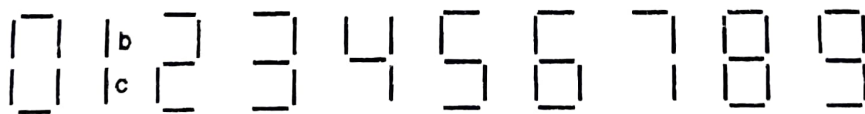Fig. (a) Segment designation   Fig. (b) Numerical designation for display

the corresponding segments in the display as shown in Fig. (a). The numeric designation chosen to represent the decimal digit is shown in Fig. (b). Design the BCD-to-seven-segment decoder circuit.

   [D.] Implement following Boolean function using exclusive or and AND gates — 2

   $F = ABCD + A'B'C'D' + ABC'D' + A'B'CD$

4. [A.] What is the disadvantage of 4-bit full adder? Design a 4-bit full-adder with look-ahead carry. 5

   [B.] Define encoder. Design Octal-to-binary encoder . 3

   [C.] What is multiplexers? Design a 4-bit magnitude comparator. 4

   [D.] Write down the purpose of EPROM. Implement the following function with a multiplexer: 2

       $F(A, B, C, D) = \Sigma(0, 1, 3, \overline{4}, 8, 9, 15)$

5. [A.] Design a 4-line to 2-line priority encoder. Include an output E to indicate that at least one input 3

       is a 1.

   [B.] How many don't-care inputs are there in a BCD adder? Design a 4-bit BCD adder. 4

   [C.] What are the difference between latch and flip-flop? Design a T-flip-flop and determine its 4

       charactersitics equation.

   [D.] Consider a JK' flip-flop, i.e., a JK flip-flop with an inverter between external input K' and 3

       internal input K.

       i.   Obtain the flip-flop characteristic table.

       ii.   Obtain the characteristic equation.

       iii. Show that tying the two external inputs together forms a D flip-flop.

6. [A.] The content of a 4-bit shift register is initially 1101. The register is shifted six times to the right, 3

       with the serial input being 101101. What is the content of the register after each shift?

   [B.] What is the difference between serial and parallel transfer? Design a serial adder using a 4

       sequential-logic procedure.

   [C.] Define binary ripple counter. Determine and show the count sequence for a binary ripple 3

       counter.

   [D.] Define memory unit architecture. Show the construction of a Johnson counter. 4

Patuakhali Science & Technology University (PSTU)
Department of Computer Science and Information Technology(CSIT)
Final Examination: July-December 2021
Course Code: CCE 222 | Course Title: Digital Logic Design Sessional
Session: 2019-20, Program: B.Sc. Engg.(CSE), Semester: 4th

<u>Marks – 70</u>

### Section A [Use Circuit board to implement *any questions* by group work]

1. *Implement following Boolean function using NAND or NOR gates*
   $F = ABCD + A'B'C'D' + ABC'D' + A'B'CD$

2. Design a circuit that compares two 4-bit numbers, A and B, to check if they are equal. The circuit has one output x, so that x = 1 if A = B, and x = 0 if A ≠ B.

Section B (Use Circuit board to Implement by group work)

3. Design a BCD-to-seven-segment decoder is a combinational circuit that accepts a decimal digit in BCD and generates the appropriate outputs for selection of segments in a display indicator used for displaying the decimal digit. The seven outputs of the decoder (a, b, c, d, e, f, g) select (a) Segment designation
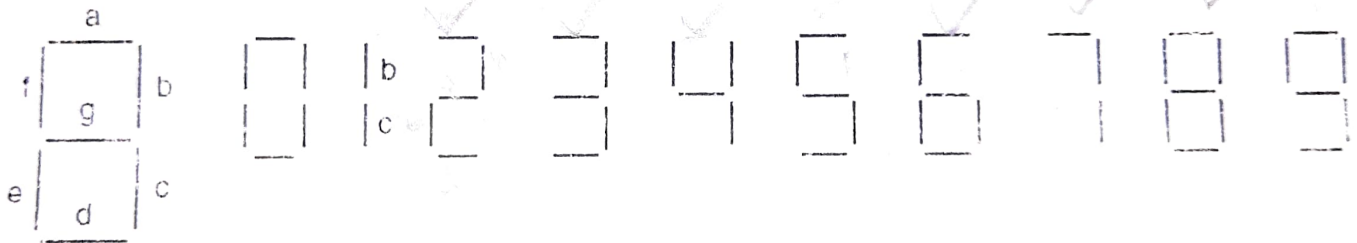
(b) Numerical designation for display

the corresponding segments in the display as shown in Fig. (a). The numeric designation chosen to represent the decimal digit is shown in Fig. (b). Design the BCD-to-seven-segment decoder circuit.

4. Lab Report

8. Viva-Voce

Dept. of Computer and Communication Engineering
Faculty of Computer Science and Engineering
Patuakhali Science and TechnologyUniversity
Dumki, Patuakhali-8602, Bangladesh

Final

~~Removal~~ Examination of B. Sc. Engineering in CSE Level: III Semester: I Session: 2019-2020

Course Code	Course Title	July-December	Credit: 03
CCE 223	Database System	2021	Time: 03 Hr
			Marks: 70

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

1 [A.] Consider the foreign-key constraint from the *dept_name* attribute of *instructor* to the *department* relation. **3**
Give examples of inserts and deletes to these relations that can cause a violation of the foreign-key constraint.

[B.] Consider the employee database. Give an expression in the relational algebra to express each of the **4**
following queries: employee (person_name, street, city) works (person_name, company_name, salary)
company (company_name, city)
a. Find the ID and name of each employee who works for "BigBank".
b. Find the ID, name, and city of residence of each employee who works for "BigBank".
c. Find the ID, name, street address, and city of residence of each employee who works for "BigBank" and earns more than $10000.
d. Find the ID and name of each employee in this database who lives in the same city as the company for which she or he works.

[C.] Explain ER Diagram for the University Management System as a database designer. **5**

[D.] List two reasons why null values might be introduced into a database. **2**

2 [A.] Define Integrity Constraints. Classify and discuss the various types of integrity constant in the DBMS with example. **3**

[B.] Differentiate among SQL, MySQL, and SQL Server. **3**

[C.] a) What is the difference between the WHERE and HAVING clauses? **3**
   b) Is the following query returns the output?
      1. SELECT subject_code, AVG (marks)
      2. FROM Students
      3. WHERE AVG(marks) > 70
      4. GROUP BY subject_code;

[D] Write the SQL statements using the university schema to perform the following operations: **5**
   a. Create a new course "CS-001", titled "Weekly Seminar", with 0 credits.
   b. Create a section of this course in Fall 2017, with sec id of 1, and with the location of this section not yet specified.
   c. Enroll every student in the Comp. Sci. department in the above section.
   d. Delete enrollments in the above section where the student's ID is 12345.
   e. Delete the course CS-001. What will happen if you run this delete statement without first deleting offerings (sections) of this course?
   f. Delete all takes tuples corresponding to any section of any course with the word "advanced" as a part of the title; ignore case when matching the word with the title.

3 [A.] Discuss SQL injection with an example, and how can it be prevented? **3**
[B.] "A schedule is called conflict serializability if after swapping of non-conflicting operations, it can transform **3**
into a serial schedule". Justify the statement.
[C.] "Transaction to transfer $50 from account A to account B". Explain ACID properties based on this **4**
transaction statement.
[D.] Define 3V of Bigdata. Explain various topics and areas of interest within the big data domain. **4**

4 [A.] What are the different types of attributes? Explain with suitable example. **7**
[B.] What is normalization? Describe different types of normalization with appropriate example. **7**

5 [A.] What are advantages of DBMS over traditional file-based systems? What are super, primary, candidate **7**
and foreign keys?
[B.] Define weak entity set. Describe weak entity set with a suitable example. **7**

6 [A.] "The cardinality ratio of a relationship can affect the placement of relationship attributes"----Justify the **7**
above statement.
[B.] CSE Club of PSTU wants to give scholarship to some students on the following criteria: **7**
   a. Students must be female
   b. Student do not get any other private scholarships such like DBBL (Dutch-bangla bank Ltd.) scholarship
   c. Grade must be at least 3.25
   d. Student should not be punished for any awful activity.
   Create necessary table (yourself) and write necessary query for i, ii, iii and iv.

Dept. of Computer and Communication Engineering   Set B

Pabnakanth Science and Technology University

Semester (Level-2, Semester II), Final Examination of B.Sc. Engg. (C.de...) July-December 2023

Course Code: CCE-223 Course Title: Database Sessional Total Marks 70

Credit Hour: 1.50 Full Marks: 70 Duration: 3 Hours

1.   Viva Voce   15
2.   **MY SQL Lab exam**   15

   a.   Find the IDs of all students in descending order who were taught by an instructor named Lembr, make sure there are no duplicates in the result

   b.   Find the ID and name of each student (ascending) who has taken at least one Comp. Sci course, make sure there are no duplicate names in the result.

   c.   Output instructor names sorted by the ratio of their salary to their department's budget (in descending order)

   d.   Output instructor names and buildings for each building an instructor has taught in. Include instructor names who have not taught any classes (the building name should be Null if no class taken)

   Create Lab exam

   a. Create a new user.

         i.   Use your name ... ... sure ... as user name with the password as your registration number as password.

         ii. Create a profile named LIMIT_LOGIN_PROFILE with ... ... login attempts.

         iii. assign the LIMIT_LOGIN_PROFILE profile to your new user.

         iv. lock the user you created for failed login attempts for 3 hours/time

         v.   unlock the user you created.

3.   Database project
4.   Lab Problem Solving

[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)(ii)** before the answer paragraph]

Answer any 5 of the following questions

1. a) How do communication and collaboration systems improve efficiency and effectiveness? What are some of the communication and collaboration system that are being used by an increasing number of organizations? 3

    b) You are a new systems analyst and eager to prove your abilities on your first project. You are at a problem analysis meeting with the system owners and users and find yourself saying, "we need to do this to solve the problem," into what common trap are you in danger of falling? What technique could you use to avoid the trap? 3

    c) What kind of knowledge and skills should a system analyst possess? 2

    d) Briefly describe the four steps in a system development process. Discuss what happens in each step? 4

    e) Assume you are a systems analyst who will be conducting a requirements analysis for an individually owned brick-and-mortar retail store with a point-of-sale system. Identify who the typical internal and external users might include? 2

2. a) As a new project manager in a rapidly growing organization, you have been asked to lead a project team for an important project. The scope of the project is not too broad, project time frames are somewhat on the tight side but definitely doable, and the budget is more than generous. In fact, you have been given the authority to hire as many people as you want for your project team.
    You estimate that 5 people would be about right for this type of project, 8 would provide a healthy amount of backup, and 10 could give you the resources to deliver an outstanding system in record time. What is something you might want to keep in mind before making your decision on how many people to hire? 2

    b) What is the trigger for communicating the project plan, and who is the audience? Why is communicating the project plan important? 2

    c) Show the business factors that are driving system analysis. Based on these factors, what should system analysis address? 2

    d) Briefly describe about the eight major activities in the project management life cycle. 5

    e) Which responsibility project managers do to manage changes that occur and/or are requested during a project? List out the factors to consider in estimating task durations. 3

3. a) What is the objective of refining the Use-case model in object design? Why is it important? 2

    b) Why do many new systems analysts fail to effectively analyze problems? What can they do to become more effective? Show the categories of resources to be allocated to the project. 4

    c) Show the commonly used technique for prioritizing system requirements. 2

    d) Describe the steps needed to construct the state chart diagram. Show the relationship between an object state and state transition event. 3

    e) Define the visibility in object-oriented design. Explain the different levels of visibility. Why are the three kinds of objects needed in object-oriented design? 3

4. a) (I). In system analysis if you use questionnaire as fact finding process which advantages and disadvantages you can get?
    (II). How DFD differs from ERD? 7

    b) (I). "The time value of money is not taken into account for Payback Analysis"- Explain the statement with appropriate example.
    (II). Differentiate between databases and conventional files. 7

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 following terminologies:
        i. Proxemics
        ii. Brainstorming. 7

    b) (I). What is the necessity of data collection? List several data collection methods. What are the advantages and disadvantages of interviews over other methods?
    (II). How reports differ for different persons and places? 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.
    (II). What are the significances of database integrity in System Analysis and Design? 7

    b) (I). What are the cases where illegal data flows happen?
    (II). Explain the following terminologies with related examples:
        i. Body language
        ii. Spatial zones 7