University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Fall-2022

Program: B.Sc. in CSE

Course Title: Theory of Computation   Course No. CSE 307

Credit: 3   Time: 1.00 Hour.

Full Mark: 60 There are **Four** Questions. **Answer three questions including Q-1 and Q-2.**

1. (a) Define automata? Explain the necessity studying automata theory?   **[10]**

     (b) Define alphabet? Suppose if Σ is an alphabet and $\Sigma=\{a,b\}$, then find out Σ^3 **[10]**

2. (a) Build a DFA that will accept all strings of only p and q and have 'pqpq' as a substring.   **[10]**

     (b) Build a NFA that will accept all strings of only p and q and end with 'pqpq'.   **[10]**

3. a. Construct the DFA from the following NFA: *Draw it.*   **[20]**

	0	1
→ p	{p,q}	{p}
q	{r,s}	{t}
r	{p,r}	{t}
*s	θ	θ
*t	θ	θ

OR

4. a. Construct the DFA from the following ε-NFA: **[20]**

	ε	a	b	c
→ p	θ	{p}	{q}	{r}
q	{p}	{q}	{r}	θ
*r	{q}	{r}	θ	{p}

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University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Fall-2022

Program: B.Sc. in CSE

Course Title: Data Communication   Course No.   CSE 303

Credit: 03   Time: 1.00 Hour.

Full Mark: 60

There are **Four** Questions. **Answer three questions including Q-1 and Q-2.**

1. a. Define the characteristics and criteria for a data communication system. [12]

    b. Draw the block diagram of a communication model and label each element of a   [8]
        communication system. What are the essential hardware requirements to establish a
        communication?

2. a. Differentiate between: [8]

        i.   Analog and digital signals

        ii. Link and channel

        iii. Protocol and Standard

        iv. LAN and WAN

    b. What are the limitations of simplex communication? Compare half duplex and full [12]
        duplex communication with merits and demerits. Mention at least three (3) examples of
        each.

3. a. Define Network topology.   [2]

    b. What are the basic topologies to setup a communication? Discuss the following   [18]
        issues for Bus, Mesh and Ring topologies:
        i.   Way of interconnection/ Diagram
        ii.   Transmission Mode (Simplex / Half duplex /Full Duplex)
        iii. Type of link (point to point/ multi- point)
        iv.   No. of links
        v.   Supporting Device
        vi.   Robustness/ Security

OR

4. a. Define Network Architecture.   [2]

    b. Draw TCP/IP Model and explain the functions of different layers to establish   [18]
        communication.

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Course Title: Object Oriented Programming II: Visual and Web Programming

Course No: CSE 309   Credit: 3.00

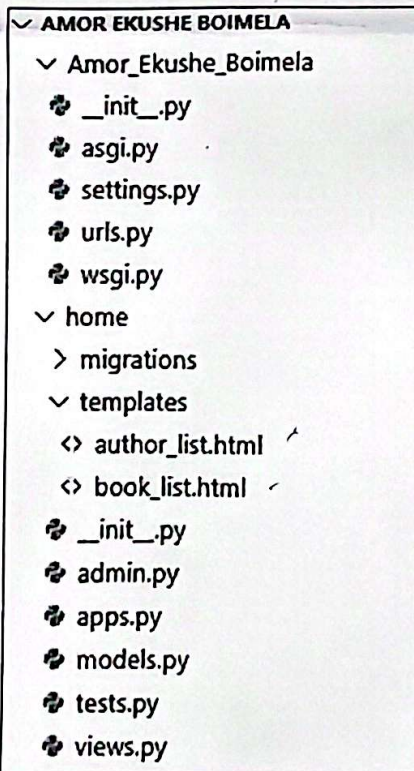Time: 1.00 Hours.   Full Mark: 60

There are **Four Questions. Answer three questions including Q-1 and Q-2.**

1. a) Bangla Academy has asked you to develop a website for the **Amor**   [20]
        Ekushe Boimela 2023. You decided that you will develop the site on
        the django platform.

        Suppose you have already developed the project structure. There is a
        project folder *Amor_Ekushe_Boimela* and an app *home*. You do not
        have to create any additional app. Now you want to add two urls in your
        website which will show all the authors' names and the books' names in
        the page.
        i.   www.ekusheboimela.com\authors
        ii.   www.ekusheboimela.com\books
        Suppose your project looks like this-

```
∨ AMOR EKUSHE BOIMELA
  ∨ Amor_Ekushe_Boimela
    ♻ __init__.py
    ♻ asgi.py
    ♻ settings.py
    ♻ urls.py
    ♻ wsgi.py
  ∨ home
    > migrations
    ∨ templates
      <> author_list.html
      <> book_list.html
    ♻ __init__.py
    ♻ admin.py
    ♻ apps.py
    ♻ models.py
    ♻ tests.py
    ♻ views.py
```

You will use the *author_list.html* and *book_list.html* files for those pages. Now describe the steps with codes in appropriate files- how you will develop those pages. For simplicity, write some demo codes in the html files.

2. a) Suppose your friend, Alice is trying to find all the numbers that are between X (exclusive) and Y (exclusive) and divisible by 5. You want to help your friend by writing her a *for* loop. [10]

Here X and Y are inputs from the user.
You have to print all the numbers in separate lines as the output.

b) Write a program in python that will take a year as an input and print if the year is leap year or not. A year is called a leap year if it is divisible by 4 but not divisible by 100, and if divisible by 100 then also divisible by 400. [10]

3. a) Write a function that will take two numbers as parameters and return their gcd using recursion. [15]

b) How can you use default values in python function parameters? Explain with example code. [5]

Or,

4. a) Write a function that will take two lists as parameters. [15]
   - The first list will contain a list of food names (Ex: Rice, Chicken, etc.)
   - The second list will contain their prices (Ex: 30, 120, etc.)

The function will then make a dictionary using these two lists where the food names will be the keys and the prices will be the values. However, there is a twist. Any food, which has a price greater than 1000 taka, will not be included into the dictionary.

Finally, the function will return the dictionary.

b) How can you use variable length arguments in python functions? Explain with example code. [5]

University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Fall-2022

Program: B.Sc. in CSE

3rd Year 1st Semester

Course Title: English II: English for Communication	Course No. HSS 301
Credit: 2.0	Time: 1.00 Hour.	Full Mark: 20

Read the passage carefully and use the reading techniques *scanning*, *skimming*, and *inferencing* to find out answers to the following questions:

The "Phi Phi Island Resort" is located in Phi Phi Leh island in Thailand, between the large island of Phuket and the west Strait of Malacca coast of the mainland. Phi Phi consists of six small islands 46km south of Phuket. Fine sandy beaches give way to soaring limestone cliffs to form spectacular scenery. Add crystal clear water, a refreshing lack of roads, plus a laid-back lifestyle, and it's easy to see why Phi Phi is one of southern Thailand's most popular destinations.

The islands are administratively part of Krabi province. Ko Phi Phi is the largest island of the group, and is the most populated island of the group, although the beaches of the second largest island, Ko Phi Phi Leh are visited by many people as well. The rest of the islands in the group, including Bida Nok, Bida Noi, and Bamboo Island are not much more than large limestone rocks jutting out of the sea. The Islands are reachable by speedboats or Long-tail boats most often from Krabi Town or from various piers in Phuket Province.

The islands came to worldwide prominence when Ko Phi Phi was used as a location for the 2000 British-American film *The Beach*. This attracted criticism, with claims that the film company had damaged the island's environment, since the producers bulldozed beach areas and planted palm trees to make it resemble description in the book, an accusation the film's makers contest. An increase in tourism was attributed to the film's release, which resulted in increases in waste on the Islands, and more developments in and around the Phi Phi Don Village.

Unlike its larger brother Ko Phi Phi, Phi Phi Leh is a virgin island – it is almost untouched by human civilization. Surrounded by sheer limestone walls dotted with caves and passages the island's shallow blue-green lagoons and coral gardens are a snorkeler's paradise. The island also has two magnificent beaches, Loh Samah and Maya Bay. (324 words)

1. Write 'T' for True and 'F' for False for the following statements. If False, write the correct answers. [5x1= 5]

    a) Phi Phi is located 46 km south of Phuket.
    b) Ko Phi Phi is the largest, though not the most populated island of the group.
    c) Islands gained their popularity after Ko Phi Phi was used for a famous film.

d) The increase in tourism had a negative effect on the Ko Phi Phi island.
e) Unlike its larger brother Phi Phi Leh, Ko Phi Phi is a virgin island.

2. Find out synonymous words from the above passage for the following words.   [5x1=5]

   a) Breathtaking (Para-I)
   b) Inhabited (Para-II)
   c) Fame (Para-III)
   d) Allegation (Para-III)
   e) Encircled (Para-V) IV (4)

3. Summarize the above text using not more than 70 words.   [5x1=5]

4. Suppose you work as a manager in an organization named ABC and there has been a number of incidents of missing stationery items from the store room. Therefore, the management of the organization has decided to install a CCTV camera in the store room. Now write a memo informing the importance of a CCTV camera to persuade all the employees of your organization.   [5x1=5]

GOOD LUCK!

University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Fall-2022

Program: B.Sc. in CSE

Course Title: Microprocessors and Assembly Language   Course No.   CSE 311

Credit: 03   Time: 1.00 Hour.

Full Mark: 60

There are **Four** Questions. **Answer three questions including Q-1 and Q-2.**

1. a. Draw block diagram of a microcomputing system. What are the functional units of a general microprocessor? Define those. **[8]**

   b. A microprocessor has a memory capacity (RAM) of 32KB (32X8). Construct 32KB capacity by using four 8KB (8 X8) chips. Show the necessary connections and address mapping. **[12]**

2. a. List out the functions of the followings: **[10]**
      i. Instruction Pointer
      ii. Queue
      iii. Stack Pointer

   b. Explain the functions of AX and DX register during multiplication and division operations with suitable example. **[10]**

      [Consider both byte and word operation]

3. a. Write appropriately the meaning of the following statements: **[10]**
      i. .MODEL SMALL
      ii. .STACK 100H
      iii. MAIN ENDP
      iv. A DW ?
      v. INT 21h

   b. Write an assembly code to input a character and display it in the next line. **[10]**

   OR

4. a. Define the six conditional flags. **[10]**

   b. Suppose AL= FFH and BL= AL= (last two digits of your registration number) H. Then show the status of six conditional flags after execution of ADD AL, BL instruction. **[10]**
      [Mention the reasons]

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University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Fall-2022

Program: B.Sc. in CSE

Course Title: System Analysis and Design   Course No.: CSE 305   Credit: 3.00

Time: 1.00 Hour.   Full Mark: 60

There are Four Questions. Answer three questions including Q-3 and Q-4.

1. a. Define system analysis and design.   [5]

    b. Demonstrate how a system analyst determines the system's functional requirements.   [5]

    c. Explain briefly about Systems Development Life Cycle (SDLC) with a diagram according to Prof. Kendall.   [10]

<center>OR</center>

2. a. Define Agile method.   [5]

    b. Explain how the Agile method encourages flexible responses to change in system development.   [15]

3. a. Calculate the critical path and project duration considering the Program Evaluation and Review Technique (PERT) using the following activity table.   [20]

Activity	Activity Time (days)	Immediate Predecessor(s)
A	7	--
B	2	A
C	4	A
D	4	B, C
E	4	D
F	3	E
G	5	E

4. a. Analyze entity, simple attribute, composite attribute, derived attribute, single-value attribute, multi-value attribute with examples in Entity Relationship Diagram (ERD).   [6*3.33 =20]

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