University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Spring-2021

Program: B.Sc. in CSE

Course Title: Data Communication Course No. CSE 303 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

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

1. a. **[15]**

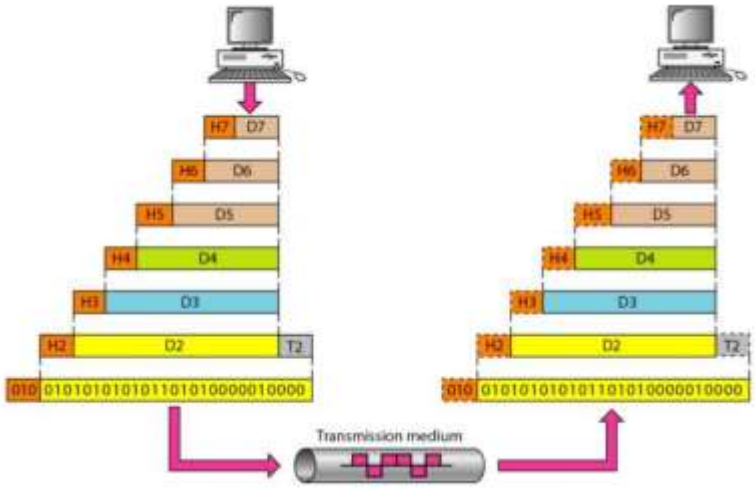

Figure 1 OSI layers

In OSI model, Data is represented by different formats and names starting from Application layer. It eventually turns into bits in the lowest layer and travels from sender to receiver and vice versa. Analyze, how Data encapsulates and decapsulates itself in different layers of OSI model starting from highest layer to the lowest layer with proper examples in each layer.

b. Suppose you want to communicate with your friend, and you have a channel with 1000 bps bandwidth. You can choose either half-duplex data flow or full-duplex data flow for your communication. Which one will you choose? Evaluate the reason behind your choice. **[5]**

2. a. You are creating an experimental setup with few network devices in your laboratory. Analyze the type of cable wiring you would consider between the following connections (A, B, C, D, E) so that a proper data communication occurs. Also, find out error if any, in the provided figure. **[10]**

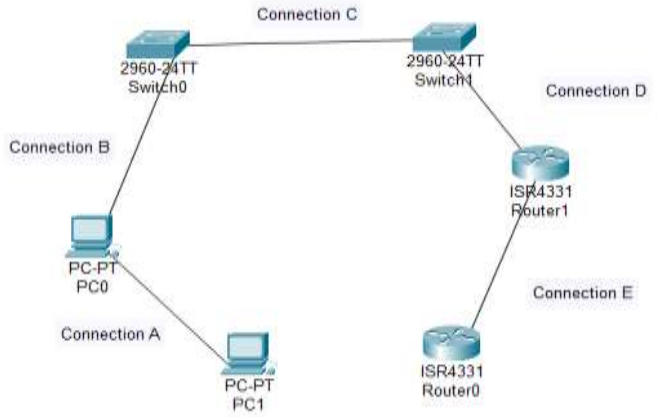

Figure 2 A simple Network topology

b. Suppose you want to measure the effectiveness of a data communication system that is running in your office. Illustrate the fundamental characteristics that needs to be considered during your measurement. **[10]**

3. a. Determine the type of the following destination addresses. You must show the detailed calculation for each one. **[3*2=6]**

i. 4C:30:10:21:1O:1A
ii. 49:20:1B:2E:08:EE
iii. F2:FF:FF:FF:FF:FF

b. The LAN market has seen several technologies such as Ethernet, Token Ring, Token Bus, FDDI, and ATM LAN. Some of these technologies survived for a while, but Ethernet is by far the dominant technology. In Standard Ethernet, the MAC sub layer governs the operation of the access method. It also frames data received from the upper layer and passes them to the physical layer. **[10+4=14]**

Draw a MAC frame and elaborate its different fields. Justify the reasons behind minimum and maximum length of a MAC frame?

OR

4. a. There are two ranges: **[10]**

192.168.0.0 - 192.168.255.255
193.168.0.0 - 193.168.255.255

Answer the following:

i) From your point of view, is there any significance of these two IP ranges?
ii) Mention key differences between these two ranges.

iii) Who owns 193.168.0.0 IP address? (you can use internet for searching)

b. "The physical addresses will change from hop to hop, but the logical addresses usually remain the same" -explain this statement with necessary facts and figures. **[10]**

University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Spring-2021

Program: BSc in Computer Science and Engineering

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

Time: 1.00 Hour. **Full Mark:** 60

Instruction(s): There are Three (3) questions. Answer all of them. All questions are of equal value. Part marks are shown in the margins.

1. a. Explain how agile approaches involve discovering systems requirements. [5]

   b. Discuss briefly about Systems Development Life Cycles (SDLC) with diagram. [15]

   or

   Suppose University of Asia Pacific is looking for a system analyst to design and develop an alumni portal for all of the former students. Now you are being asked to do the job. Perform necessary requirement analysis like Interviewing, Questionnaires, Review of Records, and Observation. [20]

2. A university registrar's office maintains data about the following entities:

   courses, including number, title, credits, syllabus, and prerequisites;

   program, including program name, total year, total semester and department name

   students, including student-id, name, email, mobile number and program;

   instructors, including identification number, name, department, and title.

   Construct an Entity Relationship Diagram (ERD) for the registrar's office. Explain all assumptions that you make about the mapping constraints. [20]

3. a. A project consisting of eight activities having the time-estimation and slack time as given below. Calculate the critical path. Determine how the slack is zero (0) for Activity A.

Activity	Immediate Processor	Activity Time (days)	Slack
A	-	15	0
B	-	20	5
C	A, B	10	15
D	B	35	0
E	C	25	5
F	C, D	30	15
G	D	20	0
H	E, F, G	5	0

[10]

b. Use the following information for a project, Draw the AON (Activity-On-Node) project network.

Activity	Immediate Processor	Activity Time (days)
A	-	6
B	-	8
C	A, B	5
D	B	4
E	C	7
F	C, D	3
G	D	6
H	E, F, G	5

[10]

University of Asia Pacific

Department of Computer Science & Engineering

Mid-Semester Examination Spring -2021

Program: B. Sc. Engineering (3rd Year/1st Semester)

Course Title: Theory of Computation Course No. CSE 307 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

There are **Four** Questions. **Answer questions 1, 4 and (2 or 3).** All questions are of equal value/Figures in the right margin indicate marks.

1.a) Why NFA is easier to design than DFA? Explain. 6

b) Let ∑ = {the letters/symbols of your own name} 14

Suppose you want to construct the following language:

"The set of all strings that accept any string of *your last name length* but will not accept your last name as a string."

Draw a corresponding NFA.

2. Suppose my name is '**a**bdul **b**aten'. I use the first letter from both first name and last name in the below figures. Use **first** letters of your **own name (first name and last name)** in the figure(s), draw it in your script and then: 6 + 14

i) Find out the ϵ-closure for each state. (Figure 1)

ii) Find the equivalent states and minimized DFA (Using the procedure of Table of state inequivalences). (Figure 2)

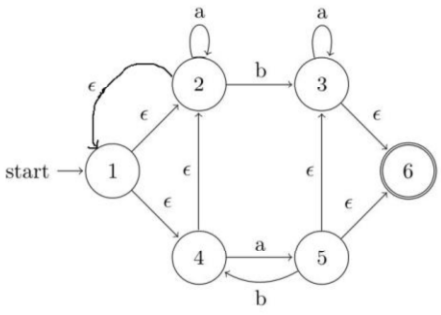

Figure 1

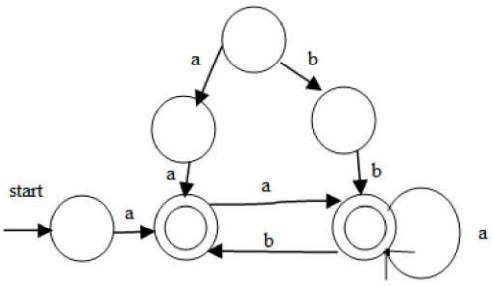

Figure 2

3. Suppose my name is '**a**bdul **b**aten'. I use the first letter from both first name and last name in the below figures. Use **first** letters of your **own name (first name and last name)** in the figure(s), draw it in your script and then: 6 + 14

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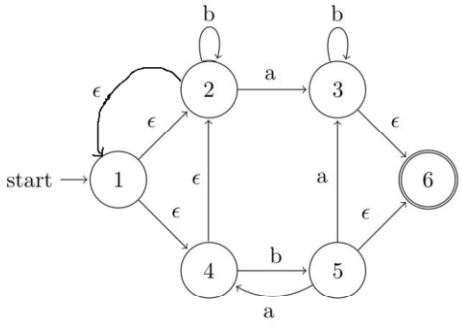

Figure 1

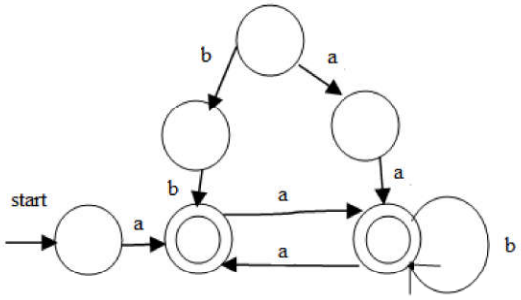

Figure 2

4.a) Write a regular expression for a website. Rules are given below: 10

1. May start with:(https://www, https://, www) or may not present.
2. If prefix is www then there will be dot (.) otherwise not.
3. Followed by website name at least (length of your first name) alphanumeric characters and at most (length of your full name) alphanumeric characters.
4. Then there will be dot (.).
5. Ending domain names are: (com, org, net, int, edu, gov, mil).

b) Draw the Finite Automata for the following regular expression: 10

i) $\sum = \{p,q\}$, RE = q(p+q)* ii) $\sum = \{a,b\}$, RE = $ab^{+}(ab+b)$

University of Asia Pacific

Department of Computer Science & Engineering

Mid-Semester Examination Spring -2021

Program: B. Sc. Engineering (2021 Year/ Spring Semester)

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. Question no 1, 2 are compulsory. Answer any of 3 or 4. All questions are of equal value. Figures in the right margin indicate marks.

In case of writing python codes, be careful about the indentations.

1.	a)	Explain the difference between Class Attribute and Instance Attribute with examples.	[8]
	b)	Suppose, we have four class named **Vehicle, Car, Truck**, and **Rickshaw**. Write a Program to incorporate the following instructions. **i) Vehicle** class has two attributes: **Speed** [in Km/h], **Number_of_Wheel** and a method **Information (self)** which prints the **Speed** in Km/h and **Number_of_Wheel**. **ii) Rickshaw** inherits the property of the **Vehicle** class and rewrite the **Information (self)** so that it can print the **Speed** in m/s and **Number_of_Wheel**. **iii) Car** and **Truck** class inherit the property of the **Vehicle** class and include new attribute named **Fuel_Type**. [Suppose car use gas and truck use diesel]. Rewrite the **Information (self)** so that it can print the **Speed** in Km/h, **Fuel_Type** and **Number_of_Wheel**.	[12]
2.	a)	Explain the difference among inline, internal, and external CSS with examples.	[10]
	b)	Write down an HTML code to generate a form that can take the following user input. i) First Name ii) Last Name iii) Gender [radio] iv) Password v) Profile image	[10]

3.	a)	Write down python code according to the following instructions. i) Create an empty list. ii) Take an integer value n from your input. iii) Write a for loop to take n integer numbers from user and append into the empty list. iv) Suppose the list has duplicate values. Now, write a program to remove all the duplicate values from the list. v) Suppose the list has both positive a negative numbers. Now, write a program to sort the list using the square of each number. **[Must use custom function]**	[20]
		or,	
4.	a)	Write down python code according to the following instructions. i) Create an empty list using list constructor. ii) Take an integer value n from your input. iii) Write a for loop to take n integer numbers from user and append into the empty list. iv) Create a new list from the existing list by replacing each positive number with its cube and each negative number with its square. **[Hints: use if else]** v) Do the same task in (iv) using **List Comprehension**.	[20]

University of Asia Pacific

Department of Computer Science & Engineering

Mid-Semester Examination Spring 2021

Program: B. Sc. Engineering (3rd Year/ 1st Semester)

Course Title: Microprocessors & Assembly Language. Course No. CSE 311 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

There are **Three** Questions. **Answer All.**

1. a. Define a microprocessor and discuss the importance of a microprocessor. If you design a microprocessor what will be characteristics you will incorporate? **[10]**

b. How can you relate the address and data bus to find out the capacity of memory? Evaluate the capacity of 8086 considering the size of address and data bus in 8086. **[10]**

2. a. Explain the special role of CX and DX registers. Define signed and unsigned numbers with appropriate scale. **[10]**

b. 'Queue operates in FIFO and Stack operates in LIFO' - explain their operations according to this phenomena. **[10]**

3. a. Write an assembly program to solve the following expression **[10]**

X= 2A-B

[Note: Consider and define three word type variables.]

b. Using the different functions of DOS Interrupt routine INT 21h do the followings: **[10]**

i. Display a prompt message "Welcome to CSE-UAP"

ii. Display the first character of your name.

iii. Input a character.

OR

a. Consider three variables, A, B and C, where A= 08H, B= last two digits of your registration number in Hex and C= 1FH. Then write the active code to do the followings: **[10]**

i. Add first two variables
ii. Swap last two variables
iii. Negative last variable

b. For the above operations (Q-a) find out the status of six conditional Flags CF, PF, ZF, SF, AF and OF. **[10]**

University of Asia Pacific
Department of CSE
Mid Term Examination, Spring 2021
Program: B.Sc. (Honors) in CSE
Year: 3rd Semester: 1st

Code: HSS 301 Course Title: English II-English for Communications Course Credit: 3.00
Time: 1 hour Total Marks: 20

*Answer all the questions
* Marks are given beside the questions

1. Read the following passage and answer the following questions:

Do we know the difference between knowledge and wisdom? Is there a need to know the difference between them? Are we well equipped to handle the vagaries of existence with what is known to us? Knowledge means all that we acquire from what we read, hear or see. Wisdom means the ability to choose from what is available to us and then use it for our own benefit. Today, the world has started talking about the value-based education. What does it mean? In simple terms it means two things. First, it accepts that current education has badly let down. Secondly, it lays stress on values, and hence wisdom, instead of mere knowledge. How do we acquire this value-based education? The answer becomes simple if we need education. We need education only to make us live better and more joyously. Once we know this, we must add only those things in education which achieve this aim. The dictum that "a healthy mind can exist only in a healthy body" is a time tested one. Schools, thus become sources of healthy bodies too. This can best be achieved by yoga because games are beyond our financial capabilities. Yoga is very beneficial. It occupies so little space, and can be done without the least bit of fuss. One wonders why schools have not adopted it as a mandatory subject at all levels.

a) How does the narrator depict the importance of education? How does it relate to yoga? 4
b) Write the summary of the above-mentioned passage and provide a suitable title. 6

Suppose a workshop that was held in the Department of CSE, University of Asia Pacific on April 17th, 2020 on **"Tech Workshop on C programming language**". Mr. Teddy George was the main trainer from the Code Club. Now, write a report on this program as one of the members of this club. 10