Tahura

Department of Computer Science & Engineering
University of Asia Pacific(UAP)

Mid Term Examination | **Spring 2019** | **3rd Year 1st Semester**
Course Code: CSE 307 | **Course Title: Theory of Computing** | **Credits: 3.00**
Full Marks: 60 | | **Duration: 1 hours**

Instructions:
1. There are **Four (4)** Questions. Answer any **Three (3)**. All questions are of equal value. Part marks are shown in the margins.
2. Non-programmable calculators are allowed.

1. a) Construct a DFA that starts with 0 and has 110 as a substring where $\epsilon = \{0,1,2\}$ — 10

   b) Convert the following NFA into DFA and also draw the transaction diagram of the NFA. — 10

	P	Q
→A	{A,B}	{A}
B	{C}	{C}
C	{D}	Φ
*D	{D}	{D}

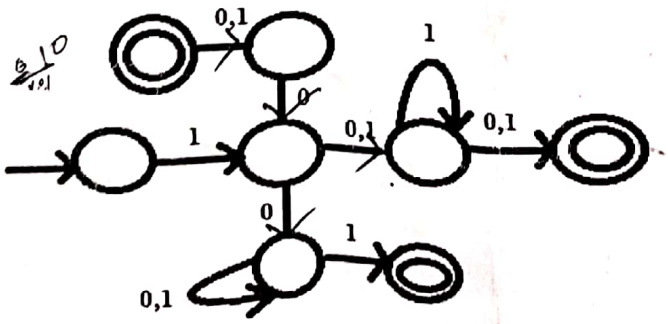
2. a) Convert the Following Regular Expression into FA: — 15
   (A+B+CD)+(IJ)*+((E+F)GH)

   b) Where can we apply Automata? — 5

3. a) Consider the following Є-NFA: — 20
      i) Find out the Є-closure for each state
      ii) Convert it into DFA
      iii) Construct the Transaction Table for the converted DFA

	Є	0	1	2
→A	{B,C}	Φ	{B}	{C}
B	Φ	{A}	{C}	{A,B}
*C	Φ	Φ	Φ	Φ

4. a) What are the difference between DFA and NFA? — 5
   b) Construct a Regular Expression of a grammar that starts with 3 ones (1), then consists a substring of zeroes (0) and ones (1) starting and ending with zero (0) and then again 2 ones (1). — 10
   c) .Find out the following Regular Expression for the following FA: — 5



Tahura Nasrin

University of Asia Pacific
Department of Computer Science and Engineering
Mid-Semester Examination Spring 2019
Program: B. Sc. Engineering (3rd Year/ 1st Semester)

Course Title: **System Analysis and Design** Course Code: **CSE 305** Course Credit: **3.00**
Time: **1 hour** Full Marks: **60**

There are Four questions. Answer any Three of them. Numbers in the right margin indicate marks

1 a Draw the system development life cycle. Give example of "Information" and "Data". 10

b Moshiur, Shoumik, Sojib and Nahian selected as a system analysts of a software development company " Mistri solution". What skills are necessary for them and why? 10

2 " Subah Tasnim " wants to build a user support system for her company "Dream.com". So she collects all necessary data and user requirements for the system. Then she formed three different teams to find out if the proposed system is safe and sound technically and economically and strategically aligned with the business. After a few weeks these teams responded positively and Subah Tasnim recruited an experienced manager Uday Datta for overall project control and direction." 20
- All these steps indicate a particular phase of SDLC.Which one is it? Describe its' steps.

3 a Following is the list of all costs and benefits of a multinational company "XYZ". Compute the cost benefit analysis using simple cash flow method. Find BEP, ROI. Is this analysis economically feasible? Justify your answer. 12

	Year 0	Year 1	Year 2	Year 3
Total benefit s	0	90000	105000	125000
Total costs	200000	12000	14500	18000

Table 1.

b Calculate the NPV using data from Table 1. Consider the rate of return is 12%. 8

4 a What possible technics are needed for requirements Gathering for a SYSTM? 5

b Write down the Five Basic Steps Interviews. How to Conduct an Interview. 7

c Define the following term: 8

- Open-Ended Questions
- Closed -Ended Questions
- Unstructured interview
- Structured interview

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Department of Computer Science & Engineering

Mid-Semester Examination Spring -2019

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 **Four** Questions. Answer any **Three**. All questions are of equal value/Figures in the right margin indicate marks.

1. (a) What do you understand by mode of operation of 8086 microprocessor? Explain minimum and maximum modes of operations. 6
   (b) Explain the evolution of microprocessor. 6
   (c) What do you understand by address bus, data bus and control bus of a microprocessor? Explain its functions. 8

2. (a) Explain the instruction: MOV AL, [A95BH] ; Assume DS=1000H. 5
   (b) Draw the internal block diagram of an 8086 microprocessor and explain its function of bus interface unit. 10
   (c) What is instruction queue of 8086 microprocessor? Explain its function. 5

3. (a) 8086 microprocessor supports 8 types of instructions: List them and explain any 2 of them with examples. 10
   (b) What are the functions of DS, CS, ES, SS and IP registers of 8086 microprocessor? Discuss with example. 10

4. (a) Explain the instruction: MOV AX, [1234H] ; Assume DS=1000H 6
   (b) How do you generate physical address of 8086 microprocessor? Explain. 6
   (c) What do you understand by addressing mode? Explain register indirect and based addressing modes of 8086 microprocessor. 8

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Mid-Semester Examination Spring-2019

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

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

Time: 1.00 Hours. | Full Mark: 60

There are **Four** Questions. Answer any **Three.** All questions are of equal value/Figures in the right margin indicate marks.

1. a) What do you mean by OSI reference model? Write the responsibilities of Physical layer and Network layer. 10

   b) Why OSI model called "Open System Interconnection"? 5

   c) A digital signaling system is required to operate at 9600 bps. 5

      i. If a signal element encodes a 4-bit word, what is the minimum required bandwidth of the channel?

      ii. Repeat part (i) for the case of 8-bit words.

2. a) Explain the most significant types of transmission impairments. 10

   b) Sketch satellite communication configuration. 5

   c) If the bandwidth of the channel is 10 Kbps, how long does it take to send a frame of 10,000 bits out of this device? 5

3. a) Define protocols and what are key elements of protocol? 10

   b) Explain the 3 ways/ modes (i.e. Simplex, Half duplex, Full duplex) of data transmission. 5

   c) Suppose a signal travels from sender 'X' to receiver 'Y'. At 'X' side the signal power is 350W, at 'Y' side the signal power is 175W. What is the attenuation in dB? 5

4. a) Describe the physical characteristics of an optical fiber and explain how it can be used to transmit data. 5

   b) Comment on the splicing techniques that are used to connect fibers and the possible loss of signal that results. 5

   c) Optical fibers are replacing copper wire communications at a rapid rate. Why this happening and what are the benefits to telecommunications companies of doing this? 10

Best of Luck

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Mid-Semester Examination Spring -2019

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

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

Course No. CSE 309 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

1.

a. What is a class attribute (static attribute)? How is it different from other types of attributes in a class? 5

b. What is interface? When do we need interface? Explain with an example. 5

c. What are the difference between interface and abstract class? Explain with an example. 10

2.

a. What is object oriented programming? 5

b. What are the features of object oriented programming? 10

c. What is programming paradigm? 5

3.

a. 10

```
def parrot(voltage, state='s', action='voom', type='Blue'):
    print("-- This parrot wouldn't", action, end=' ')
    print("if you put", voltage, "volts through it.")
    print("-- Lovely plumage, the", type)
    print("-- It's", state, "!")
```

Identify the correct and incorrect function calls with proper explanation.

i. parrot(1000)
ii. parrot(voltage=1000)
iii. parrot(voltage=1000000, action='VOOOOOM')
iv. parrot()
v. parrot(voltage=5.0, 'dead')
vi. parrot(action='VOOOOOM', voltage=1000000)
vii. parrot(110, voltage=220)
viii. parrot(actor='John Cleese')
ix. parrot('a million', 'bereft of life', 'jump')
x. parrot('a thousand', state='pushing up the daisies')

b. Implement stack and queue using python list. 5

c. Write a python function to print the following sequence up to the given limit.
my_function(10)
Output: 1 3 5 7 9

4.

a. Write a python function which returns a list of prime number up to the given limit. 5

b. Write a python function to test leap year. 5

c. Write the output of the python code. Write "error" in case of error. 10

word = 'Python'

i. word[5]
ii. word[-6]
iii. word[-60]
iv. word[2:5]
v. word[:4] + word[4:]
vi. word[-2:]
vii. word[4:42]
viii. word[0] = 'J'
ix. 'J' + word[1:]
x. word[42:]