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

Mid Semester Examination | **Spring 2016** | **4th Year 1st Semester**
Course Code: CSE405 | **Course Title: Simulation and Modeling** | **Credits: 3**
Full Marks: 60 | **Duration: 1 Hour**

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. Give examples of ODEs with the following behavior: tending towards a steady-state, chaotic behavior, periodic behavior — 3*3=9

b. How are ODEs integrated numerically? — 2

c. What is stability? What is stiffness? What is the idea behind step size control? — 3+3+3=9

2.

a. What is abstraction and idealisation? — 2

b. Explain the following terms: primary event, conditional event, event list, delay — 4*2=8

c. Explain how a discrete-event simulator works — 4

d. Suppose that you are given following information about a single server queue system. — 4*2=8

Arrival Interval	Customer arrives	Begin Service	Service Duration	Service Complete
2	2	2	4	6
3	5	6	3	9
1	6	9	5	13
1	7	13	2	15

i. What is the average waiting time of the customer?
ii. What is the average queue length?
iii. What is the probability that customer has to wait, P(customer has to wait)?
iv. What is the probability that server is busy P(Server busy)?

3.

a. Describe some common distributions and examples of their use. — 10

b. What is the unique property of the exponential distribution? — 4

c. Sketch Weibull distributions with $\beta<1$, $\beta=1$, $\beta>1$ — 3

d. Sketch Normal distributions with large and small variances — 3

4.

a. Describe the steps of data analysis. — 4

b. How is a Q-Q plot made? What exactly does a Q-Q plot reveal? — 6

c. Describe the steps to conduct chi-squared test. What does the acceptance means in chi-squared test. — 8+2=10

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Department of Computer Science and Engineering

Mid-Semester Examination Spring-2016

Program: B.Sc. Engineering (4th Year / 1st Semester)

Course Title: Compiler Design Course No: CSE-403 Credit: 3.00

Time: 1.00 Hour Full Marks: 60

There are 4 (four) Questions. Answer any 3 (three) of them. All questions carry equal marks. Figures in the right margin indicate partial marks.

1. (a) Explain the concept of 'maximul munch' in lexical specification? 8

   (b) Write down the lexical specifications of keyword, digit, identifier, whitespace. 12

2. (a) Give short descriptions on the phases of a compiler. 8

   (b) Show the NFA for the following expression 12

   i) $P^* (P \cup Q) \cup Q$

   ii) $PQ^* \cup ABC$

   iii) $A^+B^+(AB \cup B)^+$

3. (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 three alphanumeric characters and at most seven alphanumeric characters.
   4. Then there will be **dot (.)**
   5. Ending domain names are:**(com, org, net, int, edu, gov, mil)**

   Some Examples:

   ```
   domain.gov
   www.domain67.com
   http://DOMAIN.org
   https://domain.edu
   ```

   (b) Write a regular expression for a class E IP address. Class E IP address range is [240. 0. 0. 0 to 255.255.255.255] 10

4. (a) Let L ={a, b} 12

   Suppose you have constructed the following language:

   "The set of all strings consisting of zero or more instances of a or b, that is all set of a's and b's and having a substring **bab**."

   i) Write the regular expression for this language.

   ii) Draw the corresponding NFA.

   iii) Show the transition table as well DFA diagram.

   (b) What finite automaton consists of? Distinguish DFA and NFA. 8

(End of Paper)

University of Asia Pacific

Department of Computer Science and Engineering

Mid Term Examination, Spring– 2016

Program: B.Sc. Engineering (4th Year/1st Semester)

Course Title: Software Engineering Course No: CSE 401 Credit: 3.00
Time: 1.00 Hour Full Mark: 60

There are **4 (Four)** Questions. Answer any **3(Three)**. All questions are of equal value/Figures in the right margin indicate marks.

1 a) An important communication principle states "Prepare before you communicate." How will you prepare yourself to follow the principle? 06

b) Describe the Agile: XP (Extreme Programming) concepts of **Refactoring** and **Pair Programming**. 03+03

c) Write short note about the following concepts in Agile: Scrum Process Model- **Backlog, Sprint, Scrum Meeting, Demo** 08

2 a) Develop a complete use-case for: Making a withdrawal at an ATM. (hint: Draw the use case diagram, Identify the actors, write the steps for expected/ideal scenario and also write some exceptional events) 10

b) What is your idea about "**Cohesion**" and "**Coupling**" in the context of "Functional Independence"? 05

c) Discuss **Modularity** and Software Cost using a graph. Identify and explain the region of minimum cost. 05

3 Viber is an instant messaging and Voice over IP (VoIP) app for smartphones developed by Viber Media. In addition to instant messaging, users can exchange images, video and audio media messages. The client software is available for Apple iOS, Android, Windows Phone, BlackBerry OS, Nokia Series 40, Symbian, Bada, Mac OS, and Microsoft Windows. Now you are requested to take the charge as project manager of Viber.

a) How you will manage the people and project? 05

b) What will be your project management activities? 05

c) How you will expand and monitor the project? 04

d) Which tools you will use and why? 06

4 Suppose you are requested to design the official website of UAP which will reflect all the departments with their activities like research, publications, seminars, workshop, festivals, students' forum and others. You must design the template for "Word Press". The estimated budget for this project is BDT 100000 and you have to deliver the software within one month. Now do following tasks:

a) Requirement Analysis 06

b) Data Flow Diagram 06

c) Which Software Model you will prefer? Explain the reason briefly. 08

University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Spring-2016
Program: B.Sc. Engineering (4th Year / 1st Semester)

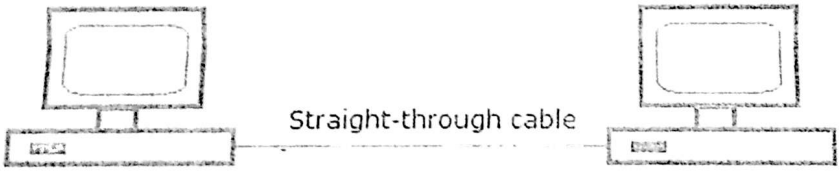
Course Title: Computer Network | Course No: CSE-421 | Credit: 3.00
Time: 1.00 Hour | Full Mark: 60

There are 4 (four) Questions. Answer 3 (three) of them. All questions carry equal marks. Figures in the right margin indicate partial marks.

1. (a) What is MAC address? How the uniqueness is being maintained for MAC address? Why both physical and logical addresses are required for networking? 2+2+4+2

   (b) What are the seven layers in Open System Interconnection model? Explain the functions of Physical, Data link and Network layers with an example. 4+6

2. (a) A network administrator is connecting hosts A and B directly through their Ethernet interfaces, as shown in the illustration. Ping attempts between the hosts are unsuccessful. What can be done to provide connectivity between the hosts? 2



IP Address: 192.168.1.20
Mask : 255.255.255.240

IP Address : 192.168.1.201
Mask : 255.255.255.240

   (b) What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask? 4

   (c) Find the subnet mask, subnet address, broadcast address and no of valid host in each subnet for the following IP address? 14
   (i) 12.45.63.139/11
   (ii) 192.168.7.77/30

3. (a) What is framing? Draw A basic frame structure. Explain the process of bit stuffing. 2+2+4

   (b) In IP addressing, address depletion problem existed from the very beginning. How scientists and researchers solved it? 6

   (c) Explain in detail the procedure of Stop-and-Wait Automatic Repeat Request protocol. 6

4. (a) Discuss why we keep some addresses as private? What is the difference between MAC and IP address? 4+4

(b) What is ARP? Why ARP is necessary? Explain step by step, with diagram, how ARP Protocol works for two connected host. 2+2+8

University of Asia Pacific

Department of Computer Science & Engineering

Mid-Semester Examination spring -2016

Program: B. Sc Engineering (4th Year/ 1st Semester)

Course Title: Computer Graphics Course No. CSE 431 Credits: 3.0

Time: 1.00 Hours. Full Mark: 60

There are **Four** Questions. Answers any **three** .All questions are of equal value/Figures in the right margin indicate marks. (Other Instructions, if any)

1.

a).write some applications of computer graphics. **5**

b) . Draw RGB color model. **3**

c) Derive Bresenham's line algorithm . **12**

2. a) Write down the required steps for Bresenham's circle algorithm. **10**

b) what is GUI? Discuss about direct color coding and look-up table. **4+6**

3. a) Show the scan conversion of a point P(X, Y). **5**

b) explains the following region filling algorithms **10+5**

i) seed fill

ii) scan line

4. a) Define 2D transformations with proper example figure. Also define composite transformation. **5+?**

b) Perform a 60° rotation of triangle A(0,0) , B(1,1), and C(5,4). **13**

i) About origin.

ii) About point P (-1,-2).

END