

University of Asia Pacific
 Department of Computer Science & Engineering
 Mid Term Examination, Spring 2016

Course Title: Operating System

Course Code: CSE 303

Credit: 3.00

Time: 1 hour

Full Marks: 60

There are Four Questions. Answer any Three. Figures in the right margin indicate marks.

1. a. Present the implementation process of thread in the user space along with their advantages and disadvantages. 6
- b. Define preemptive and non-preemptive scheduling. 5
- c. What are the main components of Operating System? Describe briefly about them. 9
2. For each of the scheduling algorithm listed below answer the following questions. 20
 - i. Determine the sequence of execution of process
 - ii. Calculate the average turn-around time for each process
 - iii. Calculate the average waiting time for all jobs

List of algorithms:

- a) First come First serve
- b) Shortest job first (preemptive)
- c) Round robin (Quantum = 5)

The relevant data is given below

Process	Order	Arrival Time	Duration
1	1	0	15
2	2	3	11
3	3	6	9
4	4	8	6

For algorithm (c) assume that an arriving process joins the queue before the quantum expired process if such event occurs simultaneously.

3. a. What is System Call? Write down the system calls that use for process management. 5
 b. Write down the disadvantage of MS-DOS Architecture and advantages of Microkernel. 6
 c. Define process and explain the different states of process using transition diagram. 9
4. a. Write down the conditions due to which a process terminates. Give examples of each of the conditions. 7
 b. Write down the difference between thread and process. 6
 c. What is pop-up thread? Describe the way to handle the global variable in Multithreaded code. 7

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

Mid Semester Examination
 Course Code: CSE 209
 Full Marks: 60

Spring 2016
 Course Title: Numerical Methods

2nd Year 2nd Semester
 Credits: 3
 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) Convert $(1000110101110101)_2$ into the Decimal form using the recursive algorithm. 14
- (b) Define and derive Newton-Raphson Method. 6
2. (a) Prove that, $(\varepsilon_R/R) \approx (\varepsilon_p/P) - (\varepsilon_q/Q)$ for error propagated in $R = P / Q$ division operation. 8
- (b) Find a real solution of the equation $2x^5 - 5x^2 - 25 = 0$, by using Interval Bisection method, situated between 1.5 and 2. 12
3. (a) Discuss Absolute error, Relative error and Percentage of error. 4 + 3 + 3
- (b) Show that, $\alpha = x_{n+1} - \frac{(\Delta x_n)^2}{\Delta^2 x_{n-1}}$ 10
- where each variable has its typical meaning.
4. (a) Find a real solution of the equation $2x^5 - 5x^2 - 25 = 0$, by using Secant method, situated between 1.6 and 1.9. 15
- (b) Why does the Newton-Raphson process act faster but cannot give guaranteed solution? 5

University of Asia Pacific
Department of Computer Science & Engineering
Mid-Semester Examination Spring-2016
Program: B. Sc Engineering (2nd Year/ 2nd Semester)

Course Title: Assembly Language Programming Course No. CSE 211 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. Any kind of Calculator is not allowed.

1. a) Write a program to take a single character input from user and check whether
input number is Perfect Number or not? 15

Sample Input	Sample Output
6	Perfect Number
9	Not Perfect

- b) Write down the difference between MOV and XCHG with example. 05

2. a) Define AX, BX, CX and DX registers in 8086? Mention at least one task for each of them. 08

b) For the memory location whose *physical address* is specified by A06EF_h, give the *logical address* for segments 923F_h. 05

c) Let assume, AX = 789A_h, BX = F29A_h, DX = CD12_h. After executing the following instructions what will be the final value of AX, BX, CX and DX. 07

ADD BX, DX
MOV CX, BX
DEC CX
XCHG AX, CX
SUB DX, 5
INC AX

3. a) Find out the valid/invalid MOV instruction and explain in short (for invalid only): 06

 - MOV [var1], AX
 - MOV AX, BL
 - MOV SS, 10
 - MOV DS, AX
 - MOV BL, AX
 - MOV DX, 3
 - MOV BH, 4A6Fh
 - MOV IP, AX

b) Write down the advantages of High Level Languages and Low Level languages? 06

// c) Write a program to take a single character input from user and check whether input number is EVEN or ODD? 08

4. a) Fill in the blanks:

i. 2^{14} Bytes = ? KB 05

ii. 2^{26} KB = ? GB

iii. 8 KB = ? Characters

iv. 14 Words = ? Bits

v. In a word (16bits) largest unsigned integer = ? h

b) What is one's and two's complement? What will be the two's complement of 55? 05

c) Write down the functionalities of:

i. INT 21h, 2h function.

ii. INT 21h, 1h function 06

d) Do the following binary subtraction: 04

$$(00110101)_b - (00111111)_b$$

Now based on the result write down the status of CF, PF, ZF.

$$\begin{array}{r} 00110101 \\ - 00111111 \\ \hline \end{array}$$

$$\begin{array}{r} 400 \\ - 53 \\ \hline 347 \end{array}$$

$$\begin{array}{r} 32 \\ - 48 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 13 \\ - 32 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 163 \\ - 151 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 27 \\ - 23 \\ \hline 4 \end{array}$$

(End of the Question paper)

University of Asia Pacific (UAP)

Department of Computer Science & Engineering

Mid Term Examination.

Year: 2nd year 2nd semester

Semester: Spring, 2016

Course no. CSE 231

Course title: Digital Logic Design

Credit: 3.0

Full Marks: 60

Time: 1 hr

(There are Four Questions. Answer any Three)

1. a) Discuss the universality of NOR gate.

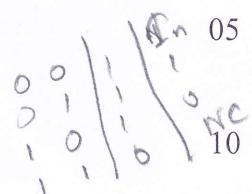
05

- b) Implement the following Boolean function with only NOR gate

$$y = A \overline{B} + \overline{A} B \overline{C}$$

- c) Implement the following function using K-map.

$$F(A, B, C, D) = \sum(0, 1, 2, 3, 7, 9, 10, 12, 13, 14, 15)$$



2. a) Draw the circuit diagram of clocked JK flip flop and briefly describe its operation.

10

- b) A 4-bit binary number is represented as D C B A, where D, C, B and A represent the individual bits with A equal to the LSB. Design a logic circuit that will produce a HIGH output whenever (the binary number is greater than 0010 and less than 1110) or (all inputs are LOW) or (all inputs are HIGH).

2
14

10

3. a) Write down the truth tables of Half adder and Full adder. Design Half adder and Full adder using logic gates.

08

- b) Briefly describe the operation of IC # 7483. Design a 4-bit parallel Adder/Subtractor using IC # 74283 and basic gates if necessary. Briefly describe its operation.

12

4. a) Draw the circuit diagram of MOD-8 up counter using JK flip-flop.

10

- b) Construct the state transition diagram of the counter.

03

- c) If the counter is initially in the 101 state, what state will it be in after 230 clock pulses?

03

- d) Determine the frequency in KHz at the output of the last flip flop when the input frequency is 4 MHz

04

University of Asia Pacific
Department of Computer Science & Engineering
Mid-Semester Examination Spring-2016
Program: B. Sc. Engineering (2nd Year/ 2nd Semester)

Course Title: Algorithms

Course No. CSE 207

Credit: 3.00

Time: 1.00 Hour.

Full Mark: 60

There are Four Questions. Answer any Three. Figures in the right margin indicate marks.

1. a) Define big-O, big-Θ and big-Ω in terms of algorithm complexity analysis. 6
Provide appropriate example.
- b) Describe Best, Worst and Average case complexity. 4
- c) Prove that: $20n^3 + 12n + 103 = \Theta(n^3)$ 10

- (2) a) Arrange the following functions of n in increasing order of complexity: 6
 i) $n \lg n$ ii) \sqrt{n} iii) $n!$ iv) n^3 v) $\lg n$ vi) 2^n
 To arrange the functions you have to find the lowest complexity, then 2nd lowest and so on.
- b) Given two source codes in C++ below, find the time complexity of them in terms of *big-O* notation 10
 i)

```
int i = 1, j = 1;
while(i<=n){ n*m
    while(j<=m) {
        j++;
    }
    i++;
}
```

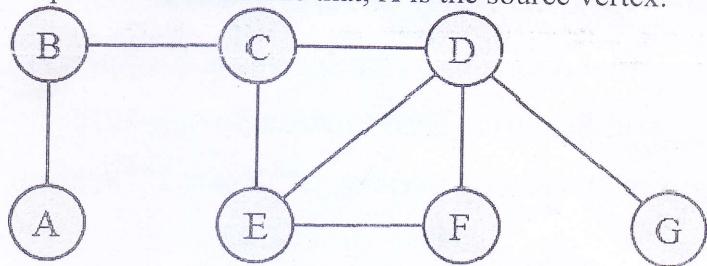
 ii)

```
int i, j, x = 0;
for(i = 1; i<=n ; i=i*2){ log2N
    for(j =1;j<=m;j++)
        x++;
}
```
- c) Big-Θ, also known as tight bound. Explain briefly. 4

3. a) Describe two popular computer representation of a graph: Adjacency Matrix and Adjacency List with example. 6
- b) Define complete graph and bipartite graph. How many edges are there in an N-vertex complete graph? Provide logical explanation of your answer. 7
- c) Suppose A is an NxN adjacency matrix. What will be the result if we create another matrix A2, where $A2 = AxA$? 7

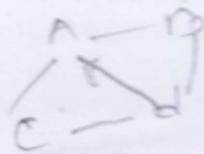
- (4) a) Given an undirected graph below. Run BFS algorithm on the graph below. 15

Show all the steps. You can assume that, A is the source vertex.



- b) Using BFS algorithm, how can we detect cycle in an undirected graph.

5



University of Asia Pacific
Department of Computer Science & Engineering
Mid-Semester Examination Spring-2016
Program: B. Sc Engineering 2nd Year 2nd Semester

Course Title: Principles of Management. Course No. IMG 201 Credit: 2.00
Time: 1.00 Hour. Full Marks: 20

Q#1: Best Matching:

5 @ 0.5

1 = Controlling Function;
4 = Figurehead Role; 2 = Effectiveness; 3=Negotiation role;
5 = None

- 1 : Checking and Balancing
2 : Compromise between same interest groups.
4 : The Pro V. C. was presiding over a prize giving meeting.
2 : Achievement of the objective using minimum resources.
5 : Filling and keeping filled the positions of the organization.

Q#2: Pick the right one:

5 @ 0.5

Entry Level Managers are rich in
You are doing a press conference
Motivating and influencing the employees
Relationship of human with other living beings
Compromise between conflicting interest groups

: conceptual skill / design skill / none.
: liaison role/ figurehead role/ none.
: planning/ leading/ none.
: ecology/ psychology/ none
: liaison role/ figurehead role/ none.

Briefly explain any Three question from below:

Marks: 3 @ 5

Q#3: Describe the Planning and Staffing Functions of Management.

Q#4: What do you mean by Whistleblower?

Q#5: Explain the Japanese Management System.

Q#6: Write down the various types of Multi National Corporation.

University of Asia Pacific
Department of Basic Sciences & Humanities
Mid-Semester Examination, Spring-2016
Program: B.Sc. Engineering (Computer Science)
2nd Year /2nd Semester

Course Title : Math-IV

Course No: MTH 203

Credit: 3.00

Time : 1.00 Hour

Full Marks: 60

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

- | | | |
|---|---|----|
| 1 | a) Find a unit vector perpendicular to both of the vectors $\underline{A}=2\underline{i}-3\underline{j}+\underline{k}$ and $\underline{B}=7\underline{i}-5\underline{j}+\underline{k}$. and also find the angle between the given vectors. | 10 |
| | b) If a particle moves so that its position vector is given by $\underline{r} = \cos \omega t \underline{i} + \sin \omega t \underline{j}$ where ω is a constant vector. Show that (i) Velocity of the particle is perpendicular to its position vector (ii) Acceleration is directed toward the origin (iii) $\underline{r} \times \underline{v} = \text{a constant vector.}$ | 10 |
| 2 | a) Define Laplace Transform. Find the Laplace transform of the function $F(t)$
where $F(t) = \begin{cases} t & 0 < t < 2 \\ 3, & t > 2 \end{cases}$ | 10 |
| | b) Find the Laplace transform of the function $F(t)$
where
(i) $F(t) = \sin at$
(ii) $F(t) = e^{-2t}(3 \cos 6t - 5 \sin 5t)$ | 10 |
| 3 | a) Define analytic function. Show that $f(z) = \bar{z}$ is non-analytic. | 10 |
| | b) Evaluate $\oint \frac{e^{3z}}{(z+1)^4} dz$, where C is the circle $ Z = 3$. | 10 |
| 4 | a) Find harmonic conjugate v of $u = 3x^2y + 2x^2 - y^3 - 2y^2$ and express $u + iv$ as an analytic function. | 12 |
| | b) Find the Laurent expansion of $f(z) = \frac{(z-1)}{(z+2)(z+3)}$ for the region $2 < Z < 3$. | 8 |