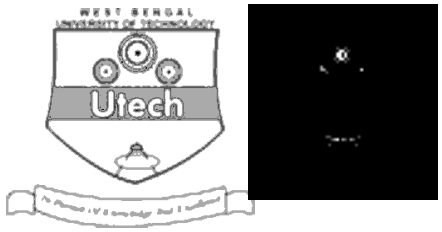
COMPUTER SCIENCE & OPERATION RESEARCH (SEMESTER - 4)

CS/B.TECH (CT)/SEM-4/CS(CT)-401/09



1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No.

Roll No. of the Candidate

CS/B.TECH (CT)/SEM-4/CS(CT)-401/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

COMPUTER SCIENCE & OPERATION RESEARCH (SEMESTER - 4)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. **This Booklet is a Question-cum-Answer Booklet.** The Booklet consists of **36 pages**. **First page** of the Booklet shows Instructions to the Candidates. The **questions** of this concerned subject commence from **Page No. 3**.
2. You have to answer the questions in the space provided marked 'Answer Sheet'. Write on both sides of the paper.
3. Fill in your Roll No. in the box provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. Use of Mobile Phone, Calculator or Log table is totally prohibited in the examination hall.
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, which will lead to disqualification.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

Question Number											***Total Marks***	***Examiner's Signature***
Marks Obtained												

.....
Head-Examiner/Co-Ordinator/Scrutineer

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The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Graph sheets are provided at the end of the booklet.

GROUP – A

(Objective Type Questions)

1. Answer all questions : $10 \times 1 = 10$

A. Choose the correct alternatives for the following :

i) In hexadecimal number system $(12)_{16}$ is equivalent to the number in decimal

a) 18 b) 12

c) 16 d) 9.

ii) Number of bytes required for double is

a) 8 b) 6

c) 4 d) 2.

iii) The ALU of a computer normally contains of a number of high speed storage elements, called

a) magnetic disk b) registers

c) hard disk d) semiconductor memory.

iv) ASCII value of 'A' is

a) 97 b) 48

c) 65 d) 67.

v) RAM stands for

a) Readwrite Access Memory

b) Random Access Memory

c) Read Access Memory

d) None of these.

vi) Operating system is a/an

a) application software b) system software

c) both of these d) none of these.

B. Answer the following very briefly :

vii) Name two input devices.

viii) What is an XOR gate ?

ix) What is the purpose of assembly level language ?

x) What is an LPP ?

GROUP – B

Answer *all* the questions.

2. a) Draw the schematic diagram of a basic computer system & describe briefly.

b) What type of memory do you use in your mobile phone ? Is it faster than optical memory ? Justify.

c) Is a blue ray disc or DVD magnetic memory ? Is it an input device ? Justify.

d) Write down the difference between compiler & interpreter.

e) Briefly describe the function of memory unit & discuss its various parts & also draw schematic diagram & explain briefly how main memory is interfaced with CPU.

f) Write a *C* program to calculate the following series without using "math.h".

$1+\frac{x}{1!}+\frac{x^2}{2!}+\frac{x^3}{3!}+\ldots..$ up to n terms. $3 + 1\frac{1}{2} + 1\frac{1}{2} + 3 + 3 + 3$

3. a) Find out the dual of the primal then solve the problem :

Maximize $Z = 3x_1 + x_2$

subject to, $2x_1 + 3x_2 \geq 2$

$x_1 + x_2 \geq 1$

and $x_1, x_2 \geq 0$.

b) For the following transportation problem obtain the different starting solution by adopting the North-West corner method & Vogel's approximation method & find out which solution is better :

	*D*1	*D*2	*D*3	*D*4	
*O*1	1	2	1	4	30
*O*2	3	3	2	1	50
*O*3	4	2	5	9	20

$7\frac{1}{2} + 7\frac{1}{2}$

GROUP – C

Answer any *three* of the following questions.

4. a) Define algorithm & flowchart. Write down the algorithm & flowchart for finding the largest of three input numbers. & also write the *C* program for the problem.

b) What is an operating system ? Write down the basic features & operation of an operating system.

c) What are the disadvantages of machine level language ? 4 + 4 + 2

5. a) In a number system there are three symbols to represent weight of each digit & they are { μ, π, β } & μ has the least weight where β has the most. If the rules remain same for this number system then how do you represent decimal 12 in this number system ?

b) Convert the following :

i) $(1314{\cdot}243)_5 = (?)_3$

ii) $(483{\cdot}65)_{10} = (?)_2$

iii) $(AF65{\cdot}24C)_{15} = (?)_4$

c) Write a *C* program to calculate the factorial of a given number. Program should have sufficient no. of comment lines. 2 + 6 + 2

6. a) Make the graphical representation of the set of constants in the following LPP :

Maximize $Z = 3x + 5y$

subject to, $2x + 3y \geq 12$

$-x + y \leq 3$

$x \leq 4$

and $y \geq 3$.

Find the extreme points of the region of feasible solutions. Find also the maximum value of the objective function.

b) Find the minimum cost solution for the 4 × 4 assignment problem whose cost coefficients are as given below :

	I	II	III	IV
1	4	5	3	2
2	1	4	– 2	3
3	4	2	1	– 5

5 + 5

7. a) Solve the following L.P.P. :

Maximize $Z = 2x_1 + 3x_2$

subject to, $x_1 + x_2 \leq 8$

$x_1 + 2x_2 = 5$

$2x_1 + x_2 \leq 8$

and $x_1, x_2 \geq 0$.

b) Solve graphically or otherwise the game of which payoff matrix is as given below :

Player *B*

Player *A*		*B* I	*B* II	*B* III	*B* IV
	A 1	1	3	0	2
	A 2	3	0	1	– 1

5 + 5

END