

USN

--	--	--	--	--	--	--	--	--	--

MATDIP401

Fourth Semester B.E. Degree Examination, June 2012
Advanced Mathematics - II

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

1.
 - a. Find the angles between any two diagonals of a cube. (06 Marks)
 - b. Find the equations of two planes, which bisect the angles between the planes $3x - 4y + 5z = 3$, $5x + 3y - 4z = 9$. (07 Marks)
 - c. Find the image of the point (1, 2, 3) in the line $\frac{x+1}{2} = \frac{y-3}{3} = -z$. (07 Marks)

2.
 - a. Find the equation of the plane through the point (1, -1, 0) and perpendicular to the line $2x + 3y + 5z - 1 = 0 = 3x + y - z + 2$. (06 Marks)
 - b. Find the value of k such that the line $\frac{x}{k} = \frac{y-2}{2} = \frac{z+3}{3}$ and $\frac{x-2}{2} = \frac{y-6}{3} = \frac{z-3}{4}$ are coplanar. For this k find their point of intersection. (07 Marks)
 - c. Find the distance of the point (1, -2, 3) from the plane $x - y + z = 5$ measured parallel to the line $\frac{x}{2} = \frac{y}{3} = \frac{z}{-6}$. (07 Marks)

3.
 - a. Show that the position vectors of the vertices of a triangle $\vec{a} = 3(\sqrt{3}\hat{i} - \hat{j})$, $\vec{b} = 6\hat{j}$, $\vec{c} = 3(\sqrt{3}\hat{i} + \hat{j})$ form an isosceles triangle. (06 Marks)
 - b. Find the unit normal to both the vectors $4\hat{i} - \hat{j} + 3\hat{k}$ and $-2\hat{i} + \hat{j} - 2\hat{k}$. Find also the sine of the angle between them. (07 Marks)
 - c. Prove that the position vectors of the points A, B, C and D represented by the vectors $-\hat{j} - \hat{k}$, $4\hat{i} + 5\hat{j} + \hat{k}$, $3\hat{i} + 9\hat{j} + 4\hat{k}$ and $-4\hat{i} + 4\hat{j} + 4\hat{k}$, respectively are coplanar. (07 Marks)

4.
 - a. Find the value of λ so that the points A(-1, 4, -3), B(3, 2, -5), C(-3, 8, -5) and D(-3, λ , 1) may lie on one plane. (06 Marks)
 - b. If $\vec{a}, \vec{b}, \vec{c}$ are the position vectors of points A, B, C, prove that $(\vec{a} \times \vec{b} + \vec{b} \times \vec{c} + \vec{c} \times \vec{a})$ is a vector perpendicular to the plane of triangle ABC. (07 Marks)
 - c. Find a set of vectors reciprocal to the set $2\hat{i} + 3\hat{j} - \hat{k}$, $\hat{i} - \hat{j} - 2\hat{k}$, $\hat{i} + 2\hat{j} + 2\hat{k}$. (07 Marks)

5.
 - a. Find the maximum directional derivative of $\log(x^2 + y^2 + z^2)$ at (1, 1, 1). (06 Marks)
 - b. Find the unit normal vector to the curve $\vec{r} = 4 \sin t \hat{i} + 4 \cos t \hat{j} + 3t \hat{k}$. (07 Marks)
 - c. Show that $\vec{F} = \frac{x\hat{i} + y\hat{j}}{x^2 + y^2}$ is both solenoidal and irrotational. (07 Marks)

6.
 - a. Find the Laplace transforms of $\sin^2 3t$ and \sqrt{t} . (06 Marks)
 - b. Find $L[f(t)]$, given that $f(t) = \begin{cases} t-1 & 0 < t < 2 \\ 3-t & t > 2 \end{cases}$. (07 Marks)

MATDIP401

c. Find the Laplace transform of $e^{2t} \cos t + t e^{-t} \sin 2t$. (07 Marks)

7 a. Find the Laplace transform of $\int_0^t \cos 2(t-u) \cos 3u du$. (06 Marks)

b. Find the inverse Laplace transform of

i) $\frac{s+1}{s^2-s+1}$ ii) $\frac{1}{s(s^2+a^2)}$. (14 Marks)

8 a. Find the inverse Laplace transform by using convolution theorem of $\frac{1}{(s^2+a^2)^2}$. (10 Marks)

b. By applying Laplace transform, solve the differential equation $\frac{d^2y}{dt^2} + 5\frac{dy}{dt} + 6y = 5e^{2t}$.
Subject to the conditions $y(0) = 2$, $y'(0) = 1$. (10 Marks)

USN

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

06MAT41

Fourth Semester B.E. Degree Examination, June 2012
Engineering Mathematics – IV

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.
2. Use of statistical tables is permitted.

PART – A

- 1 a. Employ Taylor's method to obtain approximate value of y at $x = 0.1$ and $x = 0.2$ for the differential equation $y' = x^2y - 1$, $y(0) = 1$ considering upto the fourth degree term. (06 Marks)
- b. Using Runge-Kutta method of fourth order, solve : $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$ at $x = 0.2, 0.4$. (07 Marks)
- c. Given $\frac{dy}{dx} = x^2(1 + y)$ and $y(1) = 1$, $y(1.1) = 1.233$, $y(1.2) = 1.548$, $y(1.3) = 1.979$, evaluate $y(1.4)$ by Adams – Bashforth method. (07 Marks)
- 2 a. Obtain the Cauchy-Riemann equations in polar form. (06 Marks)
- b. Verify that $v = e^x(x \sin y + y \cos y)$ is harmonic. Find u such that $f(z) = u + iv$ is an analytic function. Also find $f(z)$. (07 Marks)
- c. Find the region in the W -plane bounded by the lines $x = 1$, $y = 1$, $x + y = 1$ under the transformation $W = Z^2$. Indicate the region with sketches. (07 Marks)
- 3 a. State and prove Cauchy's integral formula. (06 Marks)
- b. Find the Laurent's expansion for $f(z) = \frac{z^2}{(z-1)(z-3)}$ in the region i) $1 < |z| < 3$; ii) $|z-1| < 2$. (07 Marks)
- c. Evaluate $\int_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2(z-2)} dz$ where C is the circle $|z|=3$, by Cauchy's residue theorem. (07 Marks)
- 4 a. Obtain the series solution of the equation $4xy'' + 2(1-x)y' - y = 0$. (06 Marks)
- b. Obtain the series solution of Legendre's differential equation $(1-x^2)y'' - 2xy' + n(n+1)y = 0$. (07 Marks)
- c. Express $4x^3 - x^2 - 3x + 8$ in terms of Legendre polynomial. (07 Marks)

PART – B

- 5 a. Fit a parabola of the form $y = a + bx + cx^2$ to the following data : (06 Marks)

x	0	1	2	3	4	5
y	1	3	7	13	21	31

- b. Obtain the lines of regression and hence find the coefficient of correlation for the data :

x	1	3	4	2	5	8	9	10	13	15
y	8	6	10	8	12	16	16	10	32	32

- c. State and prove Baye's theorem.

(07 Marks)

(07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6 a. Find mean and standard deviation of the binomial distribution. (06 Marks)
- b. The probability that an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution, determine the probability that out of 2000 individuals :
- Exactly 3 and
 - More than 2 will suffer a bad reaction. (07 Marks)
- c. The weekly wages of workers in a company are normally distributed with mean of Rs.700/- and standard deviation of Rs.50. Find the probability that the weekly wage of a randomly chosen worker is i) between Rs.650 and Rs.750, and ii) more than Rs.750. (07 Marks)
- 7 a. The mean and standard deviation of marks scored by a sample of 100 students are 67.45 and 2.92. Find : i) 95% and ii) 99% confidence intervals for estimating the mean marks of the student population. (06 Marks)
- b. Ten individuals are chosen at random from a population and their heights in inches are found to be 63, 63, 66, 67, 68, 69, 70, 70, 71, 71. Test the hypothesis that the mean height of the universe is 66 inches. ($t_{0.5} = 2.262$ for 9 d.f). (07 Marks)
- c. Explain the following terms :
- Null hypothesis
 - Confidence limits
 - Type I and type II errors. (07 Marks)
- 8 a. A fair coin is tossed thrice. The random variables x and y are defined as follows :
 $x = 0$ or 1 according as head or tail occurs on the first toss. $y =$ number of heads.
- Determine the marginal probability distribution of x and y .
 - Determine the joint distribution of x and y .
 - Determine $E(x)$, $E(y)$, $E(xy)$.
 - Determine σ_x , σ_y . (06 Marks)
- b. Define Stochastic matrix. Show that the matrix P is a regular Stochastic matrix and also find its unique fixed probability vector.
- $$P = \begin{bmatrix} 0.5 & 0.25 & 0.25 \\ 0.5 & 0 & 0.5 \\ 0 & 1 & 0 \end{bmatrix} \quad (07 \text{ Marks})$$
- c. A software engineer goes to his office everyday by motor bike or by car. He never goes by bike on two consecutive days. But if he goes by car on a day then he is equally likely to go by car or by bike the next day. Find the transition probability matrix of the Markov chain. If car is used on the first day of the week, find the probability that after 4 days
- Bike is used
 - Car is used. (07 Marks)

* * * * *

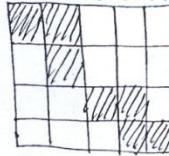
06CS42

- b. Suppose that a tree T has two vertices of degree 2, four vertices of degree 3 and three vertices of degree 4. Find the number of pendent vertices in T . (06 Marks)
- c. What is a prefix code? Construct an optimal prefix code for the symbols a, b, c, \dots, i, j that occur in a given sample with respect to frequencies 78, 16, 30, 35, 125, 31, 20, 50, 80, 03. (10 Marks)
- 4 a. Explain Prim's algorithm for finding shortest spanning tree of a weighted graph. (08 Marks)
- b. Define the following with respect to bipartite graph $G = (V, E)$:
- i) Complete matching ; ii) Maximal matching
 - ii) Deficiency of graph G . (06 Marks)
- c. Define : i) Cutset ; ii) Edge-connectivity ; iii) Vertex - connectivity with one example for each. (06 Marks)

PART - B

- 5 a. State two basic counting principles. Give an example for each. (06 Marks)
- b. A committee of 4 is to be chosen out of 6 Englishman, 5 Frenchmen and 4 Indians, the committee is to contain one of each nationality
- i) In how many ways can it be done?
 - ii) In how many arrangements will a particular Indian be? (08 Marks)
- c. Consider the following program segment, where i, j and k are integer variables
- ```
for i : = 1 to 20 do
for j : = 1 to i do
for k : = 1 to j do
print(i * j + k).
```
- Determine how many times the print( ) statement is executed in above program. (06 Marks)
- 6 a. In how many ways can these integers 1, 2, 3, ..., 10 be arranged in a line so that no even integer is in its natural position. (06 Marks)
- b. Determine the number of positive integers  $n$  where  $1 \leq n \leq 100$  and  $n$  is not divisible by 2, 3, or 5. (08 Marks)
- c. A board consists of the shaded part as in the Fig.Q.6(c). Find its Rook polynomial. (06 Marks)

Fig.Q.6(c)



- 7 a. Determine the coefficient of  $x^8$  in  $\frac{1}{(x-3)(x-2)^2}$ . (08 Marks)
- b. Find the generating function for each of the following sequence :
- i) 0, 2, 6, 12, 20, 30, 42, .....
  - ii) 8, 26, 54, 92, .....
- (06 Marks)
- c. Find a formula to express  $0^2 + 1^2 + 2^2 + \dots + n^2$  as a function of  $n$ , using summation operator. (06 Marks)
- 8 a. Solve the relation  $F_{n+2} = F_{n+1} + F_n$ , where  $n \geq 0$  and  $F_0 = 0, F_1 = 1$ . (06 Marks)
- b. Using generating function, solve  $y_{n+2} - 4y_{n+1} + 3y_n = 0$  given that  $y_0 = 2, y_1 = 4$ . (08 Marks)
- c. Find the generated solution of  $S(K) - 3S(K-1) - 4S(K-2) = 4^K$  where  $K \geq 2$ . (06 Marks)

\*\*\*\*\*

USN

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

06CS43

**Fourth Semester B.E. Degree Examination, June 2012**  
**Analysis and Design of Algorithms**

Time: 3 hrs.

Max. Marks: 100

**Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.**  
**2. Algorithms must be neatly documented.**

**PART - A**

1.
  - a. What is an algorithm? With an appropriate example, illustrate the notion of algorithm and also list the important points of an algorithm. (06 Marks)
  - b. Find the GCD of (72, 56) using middle-school procedure. Verify the result with Euclid's algorithm. (04 Marks)
  - c. Enlist the sieve algorithm to generate the prime numbers not exceeding a given number n. Illustrate the working of this algorithm for n = 30. Also prove that only numbers to consider for finding prime are upto  $\sqrt{n}$ . (10 Marks)
2.
  - a. What do you understand by the term an "algorithm design technique"? List three important reasons for learning brute force technique. (04 Marks)
  - b. Describe the standard algorithm for finding the binary representation of a positive decimal integer, in pseudocode form. (06 Marks)
  - c. Compare and contrast array and linked list. (04 Marks)
  - d. Give the adjacency linked list for the following graph. When do you prefer adjacency linked list over adjacency matrix and why? (06 Marks)

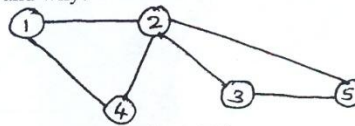


Fig.Q.2(d)

3.
  - a. Give a brief outline of the general procedure analyzing the efficiency of recursive algorithms with an example. (06 Marks)
  - b. Which of the following are true for large values of n?
    - i)  $n^2 \leq n \log n$
    - ii)  $n^3 \geq 2^n$
    - iii)  $n! \leq 2^n$
    - iv)  $n \leq n \log n$ . (04 Marks)
  - c. Give an example algorithm that needs to be analyzed for the three cases. Also find the best, worst and average efficiencies for the algorithm. (06 Marks)
  - d. Prove that  $n(n-1)/2$  is in  $\theta(n^2)$ . (04 Marks)
4.
  - a. Solve the following recurrence relations :
    - i)  $x(n) = x(\frac{n}{2}) + n$  for  $n > 1$ ,  $x(1) = 1$  (solve for  $n = 2^k$ )
    - ii)  $x(n) = x(\frac{n}{3}) + 2$  for  $n > 1$ ,  $x(1) = 1$  (solve for  $n = 3^k$ ). (04 Marks)

- b. Sort the following set of numbers using merge sort showing all the divide and merge steps.  
7 4 2 1 6 9 21 13. (04 Marks)
- c. Enlist both the quicksort and partition algorithms and show that the worst case efficiency is in  $\theta(n^2)$ . (08 Marks)
- d. Prove that multiplication of large integers using divide and conquer methods computing time  $\approx n^{1.585}$ . (04 Marks)

**PART – B**

- 5 a. What do you understand by the term transform and conquer? What are its three major variations? With an example and algorithm explain the working heap sort algorithm. (08 Marks)
- b. Sort the array 5 7 6 4 3 9 2 using heap sort. Also prove that the heap sorts algorithm efficiency is in  $O(n \log n)$ . (12 Marks)
- 6 a. With an example, explain the working of Horspools Algorithm for string matching. With a neat table and algorithm to find shift table explain the working of Horspools string matching algorithm. (08 Marks)
- b. What is hashing? With an appropriate hash function, explain the working of hash tables. Also discuss the two approaches for addressing collosions. (08 Marks)
- c. Write short note on Boyer-Moore algorithm. (04 Marks)
- 7 a. What is dynamic programming? With an example illustrate how you would compute binomial coefficient using this algorithm design technique. Also print the algorithm binomial (n, k). (10 Marks)
- b. Enlist Floyd's algorithm and explain its working with an example. Also find all pairs shortest path for the following graph using this technique. (10 Marks)

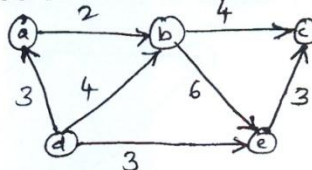


Fig.Q.7(b) Directed graph

- 8 a. Solve the following knapsack problem using dynamic approach :

| Item | Weight | Value |
|------|--------|-------|
| 1    | 3      | 25    |
| 2    | 2      | 20    |
| 3    | 1      | 15    |
| 4    | 4      | 40    |
| 5    | 5      | 50    |

Capacity  $W = 6$ 

- (06 Marks)
- b. With an example and algorithm explain the working of Kruskals algorithm. (06 Marks)
- c. Write short notes on any two of the following :
- Backtracking
  - Huffman trees
  - NP-Hard and NP-Complete
  - Branch and bound technique.
- (08 Marks)

\*\*\*\*\*



USN

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

06CS44

**Fourth Semester B.E. Degree Examination, June 2012**  
**Object Oriented Programming with C++**

Time: 3 hrs.

Max. Marks: 100

*Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.*

**PART – A**

- 1 a. Compare 'C' as procedure oriented language with 'C++' as object oriented language. (10 Marks)  
 b. What is function overloading? Explain with swapping of int /float / character strings taken as example. (10 Marks)
- 2 a. Write short notes on 'friends'. (10 Marks)  
 b. Explain the importance of static data and functions. (10 Marks)
- 3 a. Explain the set\_new\_hondler function. (08 Marks)  
 b. What is a copy constructor? Explain with example. (08 Marks)  
 c. What is function overriding? Discuss. (04Marks)
- 4 a. Define inheritance? Discuss different types of inheritances with suitable example. (10 Marks)  
 b. Explain deriving by different access specifeirs. (10 Marks)

**PART – B**

- 5 a. What are pure vertical functions? Discuss briefly. (10 Marks)  
 b. Differentiate text and binary i/o and files. (10 Marks)
- 6 a. Explain any four file pointer manipulating function. (10 Marks)  
 b. Write a program to multiply 2 matrices by overloading '\*' operator. (10 Marks)
- 7 a. Implement overloading of various relational operators for CLASS STRINGS. (10 Marks)  
 b. Discuss various aspects of overloading 'new' operator. (10 Marks)
- 8 a. Write suitable example explain various type conversion functions. (10 Marks)  
 b. Explain various functions of 'list' class available in STL. (10 Marks)

\* \* \* \* \*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

USN

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

06CS45

**Fourth Semester B.E. Degree Examination, June 2012**  
**Microprocessors**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. With the help of a neat diagram, explain the internal architecture of 8086. (12 Marks)  
b. Explain different addressing modes of 8086, with examples. (08 Marks)
- 2 a. Explain MOV instruction coding format with the help of an example. (12 Marks)  
b. Explain the following assembly language program development tools :  
i) Assembler                      ii) Debugger  
iii) Linker                              iv) Emulator. (08 Marks)
- 3 a. Explain different types of unconditional jump statements in 8086. List and explain different conditional jump statements in 8086. (12 Marks)  
b. Write a delay loop which produces a delay of 500  $\mu$ s on 8086 with 5-MHZ clock. (08 Marks)
- 4 a. Write 8086 assembly language program to do the following using string instructions :  
i) Move a string from one memory location to another.  
ii) Compare two strings located in different memory locations. (12 Marks)  
b. Explain CALL and RET instructions in 8086. (04 Marks)  
c. Explain with example how the macros are defined and called. (04 Marks)

**PART – B**

- 5 a. Explain the working of the following instructions with an example to each :  
i) MUL ; ii) JP ; iii) IRET ; iv) IDIV ; v) RCL ; vi) LOOPZ. (12 Marks)  
b. Explain with example following assembler directives :  
i) ASSUME                      ii) INCLUDE  
iii) PROC-ENDP                      iv) SEGMENT – ENDS. (08 Marks)
- 6 a. Explain with the help of neat block diagram, a simple 8086 based micro computer, with 8086 in min mode. (12 Marks)  
b. Explain the block diagram of 8086 memory bank. Discuss the accessing of byte or word from memory. (08 Marks)
- 7 a. Explain 8086 interrupt response. E interrupts of TYPE 0, TYPE 1, TYPE 2 and TYPE 4. (12 Marks)  
b. Explain with neat diagram internal organization of 8259 A priority interrupt controller. (08 Marks)
- 8 a. Explain with neat diagram internal organization of 8255 A programmable parallel port device. Discuss different modes of 8255 A. (12 Marks)  
b. Explain the control word format of 8255 A. (08 Marks)

\*\*\*\*\*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

USN

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

06CS46

**Fourth Semester B.E. Degree Examination, June 2012**  
**Computer Organization**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. Define and explain briefly the following :
  - i) Clock rate                      ii) CISC
  - iii) RISC                              iv) Basic performance equation. (12 Marks)
 b. Describe the basic functional units of a computer with a neat diagram. (08 Marks)
- 2 a. What are generic addressing modes? Write down the assembler syntax and addressing function. (10 Marks)
 b. Explain the following with reference to subroutines :
  - i) Subroutine nesting and the processor stack ; ii) Parameter passing ; iii) Stack frame. (10 Marks)
- 3 a. What is an exception? Describe the different kinds of exception. (10 Marks)
 b. How do you enable and disable interrupts? (05 Marks)
 c. Define privileged instruction and explain how privilege exception occurs. (05 Marks)
- 4 a. Explain the use of a PCI bus in a computer system with a neat sketch. (08 Marks)
 b. Draw the diagram of universal serial bus tree structure. (04 Marks)
 c. Define the following :
  - i) Serial port                      ii) Parallel port
  - iii) SCSI                              iv) USB. (08 Marks)

**PART – B**

- 5 a. Draw a neat block diagram of memory hierarchy in a computer system. Discuss the variation of size, speed and cost per bit in the hierarchy. (07 Marks)
 b. What are static and dynamic RAMS? Explain. (05 Marks)
 c. Define memory latency and bandwidth of a synchronous DRAM memory unit. (04 Marks)
 d. Define and explain the following :
  - i) Static memories                      ii) Memory access time
  - iii) RAM                                      iv) Memory cycle time. (04 Marks)
- 6 a. Draw the block diagram of virtual memory organization. (04 Marks)
 b. Explain the virtual – memory address translation with a neat diagram. (10 Marks)
 c. Discuss the organization and accessing of data on a disk. (04 Marks)
 d. A 3.5 inch (diameter) high-capacity, high-data-rate-disk has the following parameters. There are 20 data-recording surfaces with 15000 tracks per surface. There is an average of 400 sectors per track and each sector contains 512 bytes of data. Calculate the total capacity of formatted disk. (02 Marks)
- 7 a. Discuss Booth algorithm by multiplying the numbers –13 and +11. (08 Marks)
 b. Explain bit pair recoding technique by multiplying the numbers +13 and –6. (06 Marks)
 c. Explain restoring division using a 4-bit example. (06 Marks)
- 8 a. Draw the three-bus organization of the data path and describe in detail. (10 Marks)
 b. With a neat sketch, explain the basic organization of a micro programmed control unit. (10 Marks)

\* \* \* \* \*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.