B.C.A. MAY2006 First Year

PAPER-1 MATHEMATICS

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. Differentiate: log(log(log(x)))
2. Find the equation of the tangent to the curve X^2 - 2xy + $2y^2$ -7 x + 6y + 6 =0 which is perpendicular to 6x+5y-4=0.
3. Evaluate: $\int dx/ X^2 - 6 x + 5$
4. Evaluate: $\int \sqrt{sinx} / \sqrt{sinx} + \sqrt{cosx}$
5. Show that the points a+2b+5c, 3a+2b+c and 2 a + b + 3 c are collinear.
6. Find the rank of the matrix -1 -2 -l

   6 12 6

   5 10 5
7. Find the area of the triangle whose vertices are (1, 4), (3, -2) and (-3, 16).
8. Form the differential equation of all circles of radius' r '.
9. Calculate the arithmetic mean from the following frequency table.

Weights in kgs: 50 48 46 44 42 40 No. Of persons: 12 14 16 13 11 9

10. A card is drawn from each of two well-shuffled packs of cards. Find the probability that at least one of them is an ace.

PARTB **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. If Y == $(x + \sqrt{1 + X^2})^m$, prove that $(1+ X^2)Y_{n+2} + (2n + 1) X Y_{n+1} + (n^2 - m^2)Y_n$ ==O.
12. Evaluate $\int xdx/ (1 + x) (1 + x^2)$.
13. Show that the equations x + Y + z == 6, x +2y +3z ==14 and x+4y +7 z ==30 are consistent and solve them.
14. Solve (2 x + y - 3) dy == (x + 2 y - 3) dx .
15. Solve z - px -q y ==$\sqrt{1+ p^2 + q^2}$.
16. Fit an equation of the form Y == ab^X to the following data:

    x: 2 3 4 5 6

    Y: 144 172.8 207.4 248.8 298.5

PART C **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. (a) Find the angle of intersection between the curves $x^2 - y^2 == a^2$ and $x^2 + y^2 == a^2 \sqrt{2}$

    (b) Show that $\int_0^{\pi/4} \log (\tan x + \cot x) dx == \pi \log 2$.
18. (a) Prove that ix(a X i)+j X(a X j)+k X(a X k)=2a Where a, I ,j ,k are vectors (b) Find the equation of the circle the ends of diameter of which are the points (-3, 7), (5, 1). Which length of x axis intercepted by it?
19. The following data related to the marks 10 students in the internal test and the university examination for the maximum of 50 in each.

Internal marks: 25 28 30 32 35 36 38 39 42 45

university marks: 20 26 29 30 25 18 26 35 35 46

(a) obtain the two regression equation. Determine. (b) the most likely internal mark University mark of 25. (c) the most likely University Mark internal mark of 30.

B.C.A. MAY2006 First Year

PAPER-2 PROGRAMMING IN 'C'

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. What is an escape sequence? What is its purpose?
2. Write short notes on goto statement.
3. Explain the recursion with example.
4. Discuss the purpose of a static function in a multiple program.
5. Write short notes on multidimensional array.
6. Write short notes on dynamic memory allocation.
7. How do you process a structure? Give example.
8. Summarize the rules for defining bit fields.
9. Explain fscanf and fprintf with example.
10. Explain command line parameters with example.

PART B **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. Explain the meaning of more commonly used conversion characters within the control string of a scanf function with examples.
12. Write a C program to find the nCr value using function. [Formula; nCr =n! / (r! * (n-r)!)]
13. Discuss the function definition with example.
14. Explain the concept of passing arrays to functions with example.
15. Explain the general form of union with example.
16. Discuss the methods of creating a data file in C with example.

PART C **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. (a) Explain switch statement with suitable examples.(b) Write a C program to generate Fibanocci numbers. [0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55,
18. Explain any three storage class specifications with example.
19. Write a C program to find the average, N numbers and then compute the deviation of number about the average. .

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PAPER-3 DIGITAL PRINCIPLES AND APPLICATIONS

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. (a) Prove x+ xy =x (b)Prove x(x + y)= x (c) Write the Logic gate and truth table for XNOR gate.
2. Implement the following function with not using AND and OR gate (AB+A'B')(CD'+C'D) with two input gates with no more than 4 gates.
3. Simplify the functions using K map x'z' + y'z' + yz' + xyz to find SOP and POS.
4. Design a full-subtractor and explain its functions.
5. With neat diagram, discuss a 4 to 1 line multiplexer operation.

6. Draw the circuit diagram of a one-stage Accumulator.

7. Explain the operations of JK Flip -Flop.

8. Design Binary - up counter.

9. What is ROM? Draw its circuit and describe its working.

10. Draw the circuit of a 2 to 4 decoder and explain its function.

PART B **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. (a) Convert (0.6875)10to Binary. (b) Write short notes on: ASCII code.

12. Explain about Logic gates and truth tables.

13. Write short notes on: D Flip -Flop.

14. Write short notes on: Multiplexer.

15. Discuss about one stage of logic circuits with its function table.

16. Write short notes on: Status Register.

PART C **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. Describe the postulates and theorems of Boolean algebra.

18. Explain the two types of control used in a computer. Bring out the advantages of each over the other.

19. Describe the working of Half and Full subtractors with the corresponding truth tables.

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PAPER-4 PC SOFTWARE FOR WINDOWS

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. Explain the accessories window screen.

2. What are the different ways to exit windows?

3. How do you define the paper size you are using to word?

4. What is a template? What is the difference between a template and wizard?

5. Explain how to enter a formula into a worksheet cell and describe about operator precedence.

6. What are various mathematical functions used in excel?

7. What are the various financial functions in excel.

8. How to create a database?

9. What are the common features of DTP?

10. What is power point?

PART B **Answer any FOUR questions** **(4 x 10 =40 marks)**

11. Write about using file and program manager.

12. Write about using formatting text and paragraph in word.

13. Explain how to create graph in word

14. Explain excel opening window.

15 write short notes on: a) E-mail (b) Computer viruses.

16.Briefly describe how would you define a custom header for a worksheet.

PART C **Answer any TWO questions** **(2 x 15 =30 marks)**

17. Write short notes on: (a) Chart in excel (b) Database maintaining in excel (c) Help option in word.
18. Write short notes on: (a) Word art (b) Tables in word (c) Print option in word
19. Explain the mail merge facility in word

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PAPER-5 SYSTEM SOFTWARE

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions** **(6 x 5 =30 marks)**

1. Describe the looping instructions handled in SIC machines.
2. Discuss on 'Hierarchy of Languages'.
3. Write a note on MASM assembler.
4. Describe the functions of pass 1 assembler.
5. Describe about cray MPP linker.
6. What is meant by relocation? Explain.
7. How macros are defined? Explain with examples
8. Describe the ELENA macro processor.
9. Discuss on syntactic analysis.
10. Describe the debugging functions.

PART B **Answer any FOUR questions** **(4x 10 =40 marks)**

11. Describe the architecture of VAX.
12. Describe the machine independent Assembler features.
13. Describe the algorithm and data structures for a linking loader.
14. Describe in detail about recursive macro
15. Describe the features of sun OSC compilers.
16. Discuss the characteristics of SIC /XE machine.

PART C **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. Describe the Cray T3E architectures and the characteristics in detail.
18. Describe the following: (a) Machine - dependent code optimization

(b) Machine - independent code optimization.

19. Describe any two-loader design options in detail.

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PAPER-6 COBOL PROGRAMMING

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. Write down the following: (a) Reserved word (b) Character set.
2. Explain the following: (a) Data names (b) Compute statement.
3. Explain the ENVIRONMENT DIVISION.
4. Mention the purpose of Level Numbers.

5. Write a COBOL program to find the maximum number of given 3 numbers.

6 Explain "OCCURS CLAUSE".

7. Explain File Control paragraph for Indexed Files.

8. Write down the syntax of MERGE Verb with an example.

9. How is multimedia used in Office Work?

PART B Answer any FOUR questions. (4 x 10 =40 marks)

11.Write notes on: (a) ADD verb (b) SUBTRACT verb.

12. Explain the PICTURE clause and write any two code characters and their meaning.

13. Explain the two option of "INSPECT VERB".

14. Explain various types of IF statement with example.

15. Write a pay-roll program using Files. :or

16. Explain the following term: (a) CAD/CAM system (b) Product Data Management (PDM).

PART C Answer any TWO questions. (2 x 15 =30 marks)

17. Explain the various PERFORM statements with examples. What are business analysis systems?

18. Write short notes on :(a) Coding program (b) Any 10 Edit characters for Numeric Data.

19. Briefly describe the role of computers in the film industry.

B.C.A. MAY2006 Second Year

Paper-1 DISCRETE MATHEMATICS

Time: Three hours Maximum: 100 mark

PART A Answer any SIX questions. (6 x 5 =30 marks)

1. Let R = {(I, 2),(3, 4), (2, 2) } and S={(4, 2), (2,5),(3, 1),(1, 3)} find RoS, SoR R 0 (S 0 R) and S 0 (R 0 S).

2. Prove that {(x) =x / 2 is a partial recursive function.

3. Define free and bound variables with suitable examples.

4. Symbolize the expression "All the world loves lover".

5. Consider the recurrence relation.3 C_{k-5} C_{k-1} + 2 C_{k-2} =C^2 + 5 find the value of given that C_3= 2 and C_4= 4 .

6. Explain how will you obtain the solution of a recurrence relation using generating functions.

7. Prove that there is one and only one path between every pair of vertices in a tree.

8. Write any three characteristics of adjacency matrix of a graph.

9. Explain Karnaugh map with a suitable example.

10. Give a simple example of a Boolean algebra explaining the conditions satisfied by it.

PART B Answer any FOUR questions (4 x 10 =40 marks)

11.Explain the Matrix and its properties.

12.Explain PCNF and Sum of product.

13. Check if the function {(x, y) = x - y is primitive recursive function.

14. Obtain the generating function of the recurrence relation. ar =ar-l + ar-z with ao = 0, al = 2, az = 3 .

15. Prove that a graph with n vertices, and no circuits is connected.

16. State and prove absorption properties of join and meet operations in a lattice.

PART C Answer any TWO questions. (2 x 15 =30 marks)

18. (a) Show that (x) (p (x) v Q (x)) =>(x) P (x) v (:Jx)Q (x).(b) Solve a(r)-5a(r-1)+6a(r-2)=2r +r, r > 2 with a(O) = 1 and a(l) = 1.

19. (a) Describe an algorithm for generating all spanning trees of connected graph.

(b) Write a note on the applications of the Boolean algebra to the study of switching theory.

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PAPER-2 OBJECT ORIENTED PROGRAMMING IN C++

Time: Three hours maximum :100 marks

PART A Answer any SIX questions. (6 x 5=30 marks)

1. Write down the characters in C++ character set..
2. Explain the for statement with suitable example,.
3. Write a note on this pointer.
4. Define destructor. Explain.
5. Discuss about inline function.
6. Write about function prototyping.
7. What is operator overloading? Write down advantages.
8. What is inheritance? Specify the advantages.
9. Write about abstract classes.
10. What are pure virtual functions?

PART B Answer any FOUR questions (4 x 10 =40 marks)

11. Write in brief about the basic concepts of object oriented programming.
12. Discuss about switch statement. Give a program example
13. Discuss about multiple constructors in a class.
14. Write a note on 'Types of functions'.
15. Explain with a suitable program example, how to m ake a private member inheritable.
16. Write down the rules for virtual functions.

PART C Answer any TWO questions. (2 x 15 =30 marks)

17. Discuss on the following (a) Multiple inheritance (b) Multilevel inheritance
18. Write a C++ program to overload -to subtract two complex numbers.
19. Write short on the following. (a) Enumerated data types. (b) Pointer to objects (c) Pointers to derived classes.

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PAPER-3 COMPUTER GRAPHICS

Time: Three hours Maximum: 100 marks

PART A Answer any SIX questions. (6 x 5 =30 marks)

1. Write the slope-intercept and general forms of a line and explain.

2. Explain the method of determining perpendicular

3. Write a note on the use of frame buffers.

4. Write a note on device coordinates.

5. Describe the method of representing polygons.

6. Write and explain the three basic transformations.

7. Explain the use of matrices in transformations with examples.

8. What are inverse transformations? Explain.

9. Explain how lines outside the screen are identified in Cohen-Sutherland algorithm.

10. Define image space and object space. Give examples.

PART B Answer any FOUR questions. (4 x 10= 40 marks)

11. What is digital differential analyzer? Explain.

12. Explain the functioning of DVST.

13. Explain the functioning of vector refresh display system.

14. Explain the inside tests for polygons.

15. Explain reflection, shear and coordinate transformations.

16. Explain the following: (a) Viewing transformation (b) Position relative to an arbitrary line.

PART C Answer any TWO questions. (2 x 15= 30marks)

17. Explain the Cohen-Sutherland algorithm for line-clipping.

18. Explain the Bresenham's line drawing algorithm.

19. Explain the following: (a) Character generation (b) Graphics primitive operations.

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PAPER-4 OPERATING SYSTEM

Time: Three hours Maximum: 100 marks

PART A Answer any SIX questions. (6 x 5 =30 marks)

1. Is there any difference between multiprogramming and multitasking? If so explain.

2. Describe any four main purposes of an operating system.

3. What is the difference between logical address and physical addresses?

4. Consider a swapping system in which memory consists of the following hole sizes in memory order: 10 kB, 4 kB, 20 kB, 18 kB, 7 kB, 9 kB, 12 kB and15 kB. Which hole is taken for successive segment requests of (a) 12kB (b) 10kB (c) 9kB for first fit? Now repeat the question for best fit and worst fit.

5. What are the criterias to be considered in CPU scheduling?

6. What is deadlock? How can you avoid it?

7. What is file? What are the operations of a file?

8. Discuss about disk initialization.

9. Briefly describe the main features of DOS.

10. Classify the Kernel objects of Windows NT and explain.

PART B Answer any FOUR questions. (4 x 10 = 40 marks)

11. Describe the evolution of operating system.

12. Describe the steps to create a process. When the process terminated?

13. Consider the following set of processes that arrive at time 0, the length of the CPU burst time given in milliseconds.

Process	Burst Time
PI	5
P2	24
P3	16
P4	10
P5	3

14. Explain the single partition allocation scheme. Also write the advantages and disadvantages of single partition scheme.

15. Describe any three disk scheduling.

16. How the file system is maintained in UNIX? Explain.

PART C Answer any TWO questions. (2X15=30marks)

17. Explain the segmentation scheme in detail.

18. Describe the four necessary conditions for deadlock. Also discuss about deadlock prevention.

19. Describe the most common schemes for designing the logical structure of a directory.

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PAPER-5 COMPUTER ORGANIZATION

Time: Three hours Maximum: 100 marks

PARTA Answer any SIX questions. (6 X5 =30 marks)

1. Explain the various computer registers.

2. Write short notes on input output interrupt.

3. What is an assembler? What are subroutines?

4. Write an assembly language program for subtraction.

5. What are data transfer instructions?

6. Write down the micro operations for PUSH and POP.

7. Explain direct memory access.

8. Write short notes on serial communication.

9. Explain memory hierarchy.

10. Draw the. block diagram of memory connection to the CPU.

PART B Answer any FOUR questions. (4 x 10 =40 marks)

11. Write down the micro operations for complete computer description.

12. Write an assembly language program multiplication.

13. Explain first pass and second pass assemblers.

14. Explain the various addressing modes.

15. Explain a synchronous data transfer.

16. Compare RAM and ROM with block diagrams.

PART C Answer any TWO questions. (2 x 15 =30 marks)

17. Explain general register organization.

18. Write short notes on: (a) Instruction codes (b) Peripheral devices (c) RISC.

19. Explain the various auxiliary memories.

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PAPER-6 COMPUTER ALGORITHMS AND DATASTRUCTURE

Time: Three hours Maximum: 100 marks

PART A Answer any SIX questions. (6 x 5 =30 marks)

1. Write algorithm to control abstraction for Divide-and-Conquer.

2. Write an algorithm for finding k^{th} smallest element

3. What is meant by Knapsack problem? Give example.

4. Write about two-way merge patterns.

5. Write short notes on Travelling Salesperson problem.

6. Define preemptive. Give example.

7. Define stack. Write an algorithm to remove an item from the stack.

8. Define generalized list. Give example.

9. How do you represent a tree in memory? Explain.

10. Write short note on decision trees.

PARTB Answer any FOUR questions. (4 x 10 =40 marks)

11. Discuss the method for finding the maximum and minimum.

12. Explain minimum-cost spanning trees with example

13. Explain all-pairs shortest path with example.

14. Define queue. Explain the operations of queue with example.

15. Describe storage compaction with example.

16. Discuss the in order and post order traversal with example.

PART C Answer any TWO questions. (2 x 15 =30 marks)

17.(a) Explain quick sort with example. (b) Explain the two-way merge tree. algorithm for generating (8)

18. Explain Multistage graph with example.

19. Explain doubly linked list with example.

B.C.A. MAY2006 Third Year

PAPER-1 SOFTWARE ENGINEERING

Time : Three hours **Maximum: 100 marks**

PARTA **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. Explain the total effort devoted to software.
2. What are the important management problems?
3. Write about 'estimating software maintenance costs'.
4. Write a note on 'work breakdown structures'.
5. What is the use of decision tables? Explain.
6. Write short notes on: Petri Nets.
7. Write about Stepwise Refinement.
8. Explain: Walk through.
9. Explain: Unit testing.
10. What are automated tool for S/W maintenance?

PARTB **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. What are the quality and productivity factors?
12. Explain the Algorithmic cost models in detail.
13. Explain Gist.
14. Explain the concepts of coupling and cohesion.
15. Explain the design techniques in detail.
16. Explain detail in about configuration management.

PARTC **Answer any TWO questions.** **(2 x 15 = 30 marks)**

17. Explain the steps involved in planning a software project.
18. Explain in detail about the software requirements specification.
19. Explain in detail about the implementation phase of software development.

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PAPER-2 CLIENT/SERVER COMPUTING WITH ORACLE

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. What is data integrity?
2. What are the different types of users?
3. Discuss about the pitfalls of Client/Server technology.
4. Write down the characteristics of Client/Server Model.
5. Explain Data Control commands.
6. What is a trigger, explain its different types?
7. Write any two DML command with examples.
8. How the errors can be trapped?

9. What are the functions of DBA?

10. What are the advantages of PL/SQL over SQL?

PART B **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. What are the objectives of database system?

12. Describe Concurrency Control System.

13. Discuss the benefits of Client/Server Technology.

14. Explain about DDL with example.

15. What are the control statements available in PL/SQL?

16. What are the measures to be taken so as to protect database file?

PARTC **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. Write down the formal definition of relational model.

18.(a) Differentiate local and global variable. (b) What are the data types available in PL/SQL?

19. Explain how the database administrator planning for database installation.

B.C.A. MAY2006 Third Year

PAPER-3COMPUTER NETWORKS

Time: Three hours **Maximum: 100 marks**

PART A **Answer any SIX questions.** **(6X5=30)**

1. Describe about Broadcast of Networks.

2. Describe the features of ARPANET.

3. Discuss on Radio Transmission.

4. Describe in detail about Wavelength Division Multiplexing.

5. Describe the various framing methods.

6. What do you mean by persistent CSMA? Explain.

7. Compare Datagram subnet with VC subnet.

8. Write a note on Berkeley Sockets.

9. Describe the built in HTTP Request Methods in detail.

10. Describe the contents of a Mailbox in Email

PART B **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. Describe in detail about WAN and MAN.

12. Describe the structure of the telephone system in detail.

13. Describe the simplex stop and wait protocols in detail.

14. Describe about wireless LAN protocols in detail.

15. Discuss the services provided by Network Layer to Transport Layer in detail.

16. How to write a webpage in HTML? Explain.

PART C **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. Describe the OS1 Reference Model layers in detail.

18. Discuss the various kinds of communication satellites.

19. Describe any two Routing Algorithms in detail.

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PAPER-4 MULTIMEDIA TECHNOLOGY AND APPLICATIONS

Time: Three hours **maximum: 100 marks**

PART A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. Define Multimedia. What are the components of multimedia?

2. What issues for evaluation do you apply in selecting and purchasing multimedia products?

3. What are the software drivers for multimedia support?

4. Explain the types of fonts.

5. What are the elements on Graphics?

6. Compare the functions of simple and complex digital audio software editors.

7. Explain the component video.

8. Compare interactive and non-interactive multimedia.

9. What are the features of multimedia tool?

10. What are the various function of Internet?

PART B **Answer any FOUR questions.** **(4 x 10 =40 marks)**

11. What are the resources of multimedia developers?

12. Explain the computers with it's basic elements in detail.

13. Explain the aspects of the digital audio video operation.

14. Explain how the text is used in multimedia application.

15. Explain bit map images in detail.

16. Discuss digital audio systems.

PARTC **Answer any TWO questions.** **(2 x 15 =30 marks)**

17. Discuss the ways for obtaining images for multimedia use.

18. Explain the various multimedia authoring tools in detail.

19. Discuss the communication protocol in detail.

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PAPER-5 JAVA PROGRAMMING

Time: Three hours **Maximum: 100 marks**

SECTION A **Answer any SIX questions.** **(6 x 5 =30 marks)**

1. Explain how Java handles 'memory' usage.

2. Explain what a 'separator' is and its use.

3. Discuss the use of 'comma' statement

4. Ilustrate method overloading with an example.

5. Explain the string concatenation ideas in Java.

6. Explain the use of 'finally' keyword in Java.

7. What are the methods of Inet Address? Explain.

8. Write a note on URL.

9. Explain the idea of simple image loader.

10.Explain the order of applet initiation.

SECTION B Answer any FOUR questions (4 x10 =40 marks)

11. Discuss the requirement of each keyword in the following Java program statement. "Public static void main (sting args [ ])".

12. Illustrate the idea of constructor overloading.

13. Explain the use of nested 'try' statements.

14. Explain the method of Input stream.

15. Write a note on Font metrics.

16. Write a note on URL connection.

SECTION C Answer any TWO questions. (2 x 15 =30 marks)

17. Write a Java program to explain the usage of fonts.

18. Develop an applet to draw colored bars and explain.

19. Explain the graphic methods available in Java.

B.C.A. MAY2006 Third Year

PAPER-6 OPERATIONS RESEARCH

Time: Three hours Maximum: 100 marks

PART A Answer any SIX questions. (6 x 5 =30 marks)

1. What are the main phases of O.R. study?

2. Define O.R. and discuss its scope.

3. What is degeneracy? Discuss a method of resolve degeneracy in LP Problems.

4. Find the basic solutions for $3X_1+6X_2+5X_3+X_4=12$ $X_1+4X_2+X_3+2X_4=8$

5. Obtain the dual of the LPP. Max z= $X_1 -X_2+3X_3$ subject to the constraints $X_1+X_2+X_3<=10$, $2X_1- X_2<=2$, $2X_1-2X_2+3X_3<=6$ and X_1, X2, X3>=0

6. What are the disadvantages of Big-M-method over two phase method?

7. Define 'Assignment Problem'. Give an example of it.

8. Explain the conceptual justification that an assignment problem can be viewed as a linear programming problem.

9. Describe the matrix form of the transportation problem. Illustrate with 2 origins and 3 destinations.

10. Explain in detail, anyone method for solving a transportation problem.

PARTB Answer any FOUR questions. (4 x 10=40 marks)

11. "Mathematics of O.R. is mathematics of optimization". Discuss.
12. Find the solution of the following LPP graphically Max $Z=3x_1 + 5x_2$ Subject to $x_1+2x_2 \leq 2{,}000$ $x_1+x_2 \leq 1{,}500$ $x_2 \leq 600$ and $x_1, x_2 \geq 0$
13. Use Two-phase method to maximize $z= 3X_1-X_2$ subject to the constraints $2X_1 + X_2 \geq 2$, $X_1 + 3X_2 \leq 2$, $X_2 \leq 4$ and $X_1, X_2 \geq 0$.
14. Solve the following assignment problem

	I	II	III	IV
A	8	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

15. Determine the initial basic feasible solution

		Destination				
		1	2	3	4	Supply
Source	1	21	16	15	3	11
	2	17	18	14	23	13
	3	32	27	18	41	19
Demands		6	10	12	15	43

16. Solve the LP problem by simplex method Max $z =3X_1 + 5X_2 + 4X_3$ subject to $2X_1 + 3X_2 \leq 8$ $2X_2 + 5X_3 \leq 10$ $3X_1 + 2X_2 + 4X_3 \leq 15$ and $X_1\ X_2\ X_3 \geq 0$

PARTC Answer any TWO questions. (2 x 15=30 marks)

17.Solve the following degeneracy problem: Max $z =2X_1 + X_2$ subject to

$4X_1 + 3X_2 \leq 12$, $4X_1 + X_2 \leq 8$, $4X_1 - X_2 \leq 8$ and $X1 \geq 0, X2 \geq 0$.

18. Apply the principle of duality to solve the L.P ax $z = 3X_1 - 2X_2$ Subject to the constraints $X_1 + X_2 \leq 5$ $X_2 \leq 4$ $1 \leq X_2 \leq 6$ $X_1, X_2 \geq 0$

19. A company has three plants at locations A, B and C which supply to warehouses located at D, E, F, G, and H. monthly plant capacities are 800, 500 and 900 units respectively. Monthly warehouse requirements are 400, 400, 500, 400 and 800 units respectively. Unit representation costs (in Rs) are given below.

		To				
		D	**E**	**F**	**G**	**H**
	A	**5**	**8**	**6**	**6**	**3**
From	**B**	**4**	**7**	**7**	**6**	**6**
	C	**8**	**4**	**6**	**6**	**4**

Determine an optimum distribution for the company in order to minimize the total **transportation cost**