

BTS – V(SS) – 06.14 – 0508

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## B.Tech. Degree V Semester Special Supplementary Examination June 2014

IT/CS/CE/SE/ME/EE/EB/EC/EI/FT 501 ENGINEERING MATHEMATICS IV  
(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

### PART A (Answer ALL questions)

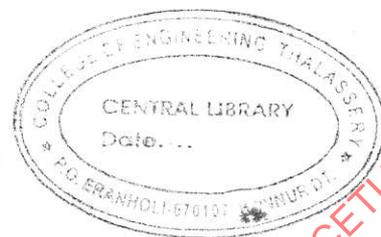
(8 × 5 = 40)

- I. (a) Find the mean and variance of a random variable having density function

$$f(x) = \begin{cases} 12x^2(1-x), & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

- (b) For a binomial distribution with  $n = 6$ , the third term is nine times the fifth term. Find 'P'.  
(c) A random sample of 900 items with mean 3.5 and standard deviation 2.61 is drawn from a normal population. Determine a 95% C.I. for  $\mu$ .  
(d) Briefly explain the procedure for testing of hypothesis.  
(e) Prove that  $1 + \mu^2 \delta^2 = \left(1 + \frac{1}{2} \delta^2\right)^2$ .  
(f) From the following table find the missing value  
x: 2    3    4    5    6  
y: 45.0 49.2 54.1 - 67.4  
(g) Solve  $\frac{dy}{dx} = x^2 + y^2, y(0) = 1$  at  $x = 0.1$  using Taylor series method.

- (h) Evaluate  $\int_0^1 \frac{1}{1+x^2} dx$  using Trapezoidal rule taking  $h = 0.2$ .



### PART B

(4 × 15 = 60)

- II. (a) Between the hours of 2 and 4 p.m. the average number of phone calls per minute coming into the switch board of a company is 2.5. Find the probability that during one particular minute there will be  
(i) no phone call at all  
(ii) exactly 2 calls  
(iii) at least 5 calls  
(b) In a competitive examination 5000 students have appeared for a paper in Statistics. Their average mark was 62 and standard deviation was 12. If there are only 100 vacancies find the minimum marks that one should score in order to get selected.

OR

- III. (a) Find the rank correlation coefficient for the following data  
x: 100 101 102 100 100 99 97 98 96 95  
y: 98 99 99 97 95 96 95 94 90 96  
(b) Fit a good straight line to the following data. Also calculate  $y$  when  $x = 14$ .  
x: 10 11 12 13 16 17 20 25  
y: 10 22 24 27 29 28 33 37

(P.T.O.)

- IV. (a) A stenographer claims that she can take dictations at the rate of more than 120 words per minute. Of the 12 tests given to her she could perform an average of 135 words with a standard deviation of 40. Is her claim valid? ( $\alpha = .01$ )
- (b) Ten soldiers visit a rifle range for 2 consecutive weeks. For the first week, their scores are 67, 24, 57, 55, 63, 54, 56, 68, 33, 43 and during second week, they score in the same order 70, 38, 58, 58, 56, 67, 68, 72, 42, 38. Examine, if there is significant difference in their performance.

OR

- V. (a) For a sample of 100 labourers from Kerala, the average daily wages is ₹10.50 with S.D. ₹1.50. For a sample of 150 labourers from Tamil Nadu the corresponding figures are ₹8.00 and ₹1.00 respectively. Can you conclude that average wages of workers in Kerala are more than that of workers in Tamil Nadu?
- (b) The time taken by workers in performing a job by method I and method II are given below:
- |            |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|
| Method I:  | 20 | 16 | 26 | 25 | 23 |    |
| Method II: | 28 | 33 | 42 | 35 | 52 | 34 |
- Does the data show that variance of time distribution by 2 methods do differ significantly?

- VI. (a) Using Stirlings formula find  $y(35)$  from the following:
- |    |     |     |     |     |
|----|-----|-----|-----|-----|
| x: | 20  | 30  | 40  | 50  |
| y: | 512 | 439 | 346 | 243 |

- (b) Evaluate  $\int_0^6 \frac{1}{1+x} dx$  using
- (i) Simpson's 1/3 rule
  - (ii) Simpson's 3/8 rule

OR

- VII. (a) Using Lagrange interpolation find  $y(10)$  from the following
- |    |    |    |    |    |
|----|----|----|----|----|
| x: | 5  | 6  | 9  | 11 |
| y: | 12 | 13 | 14 | 16 |

- (b) Find  $f'(10)$  and  $f''(10)$  from the following:
- |        |         |       |       |        |        |
|--------|---------|-------|-------|--------|--------|
| x      | : 10    | 11    | 12    | 13     | 14     |
| $f(x)$ | : 40.62 | 60.80 | 79.95 | 103.56 | 132.65 |

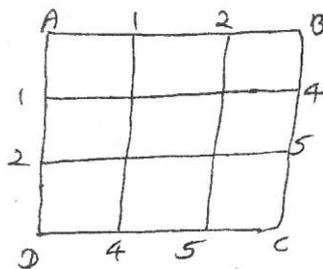
- VIII. (a) Use Range-kutta method to find the value of  $y$  when  $x = 0.2$  in steps of 0.1 if  $\frac{dy}{dx} = x^2 + 2y$ ,  $y(0) = 0$ .

- (b) Solve  $U_{xx} - 2U_t = 0$ , given  $u(0, t) = 0$ ,  $u(4, t) = 0$ ,  $u(x, 0) = x(4 - x)$ . Assume  $h = k = 1$ . Find the values of  $u$  upto  $t = 5$ .

OR

- IX. (a) Given  $\frac{dy}{dx} = \frac{y-x}{y+x}$ , with  $y = 1$  for  $x = 0$ . Find  $y$  approximately for  $x = 0.1$  by Euler's method taking  $h = 0.02$ .

- (b) Solve the elliptical equation  $U_{xx} + U_{yy} = 0$ .



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D

***B.Tech. Degree V Semester Special Supplementary  
Examination June 2014***

**IT/CS 502 SYSTEM PROGRAMMING**  
(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

**PART A**  
(Answer *ALL* questions)

(8 x 5 = 40)

- I. (a) What are the different types of records in an object oriented program? Explain with an example.
- (b) How are the symbol defining statements handled by assemblers?
- (c) Write notes on linkage editor.
- (d) Write a simple algorithm for an absolute loader.
- (e) Explain about concatenation of macro parameters with example.
- (f) What is meant by recursive macro expansion?
- (g) Give notes on virtual machines.
- (h) Describe the hierarchical structure of operating system.



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**PART B**

(4 x 15 = 60)

- II. Explain the design of two-pass assembler.
- OR**
- III. Explain control sections and program linking. How are they handled by the assemblers?
- IV. List the data structures used for linking loader and explain the content of these data structures in pass 1 and pass 2.
- OR**
- V. (a) Explain dynamic linking.
- (b) What is program relocation and how it is handled?
- VI. Explain design of a macro processor with suitable example.
- OR**
- VII. Describe machine independent macro processor features.
- VIII. Describe the features of multiprocessor OS and distributed OS.
- OR**
- IX. Explain (i) User Interface  
(ii) Runtime Environment in an OS.

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B

***B.Tech. Degree V Semester Special Supplementary  
Examination June 2014***

**CS/IT 503 SOFTWARE ENGINEERING**  
(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100



**PART A**  
(Answer *ALL* questions)

(8 × 5 = 40)

- I. (a) What is a process model? What are the advantages of following a process model for software development?  
(b) Explain the use of decision tables in specifying the requirements with an example.  
(c) Briefly explain abstraction as a design principle.  
(d) What is software maintenance? What are the different types of software maintenance?  
(e) Compare the quality standards ISO 9000 and CMM.  
(f) List and explain any five desirable characteristics that a good user interface should possess.  
(g) Explain the use of Gantt chart and WBS in software project scheduling.  
(h) Describe the different methods for organizing the staff in a software organisation.

**PART B**

(4 × 15 = 60)

- II. What do you mean by SRS? What is the need for SRS in software development? Explain the components of an SRS.
- OR**
- III. Explain with the help of a diagram the different phases of waterfall model. What are the drawbacks of this model? How is prototyping model used to overcome these disadvantages?
- IV. What is modularity? Explain cohesion and coupling as the factors to measure the modularity of a design.
- OR**
- V. What is design? Explain the activities carried out in design phase to transform the SRS obtained from the previous phase to the software architecture.
- VI. What is the need for testing software before delivering it to the client? What are the different levels of testing? Explain in detail the various testing strategies used in these levels.
- OR**
- VII. Define software quality. Which are the factors associated with the quality of a software product? What are the activities to be carried out by software quality management system to ensure quality of a software product?
- VIII. What is computer aided software engineering? List the benefits of using it in software development. Briefly explain CASE tools used in various phases of software development.
- OR**
- IX. List the activities of project planning. Give an overview of estimation activity and different categories of estimation techniques.

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A

***B.Tech. Degree V Semester Special Supplementary  
Examination June 2014***

**IT 504 COMPUTER GRAPHICS AND ANIMATION  
(2006 Scheme)**

Time : 3 Hours

Maximum Marks : 100

**PART A**  
(Answer *ALL* questions)

(8 × 5 = 40)

- I. (a) What is computer graphics? Write any five areas where computer graphics is applied.
- (b) Differentiate between raster scan and random scan display.
- (c) Prove that successive 2D translations are additive.
- (d) Define the term fractals and fractal dimension. What are the different classification of fractals?
- (e) Define the terms window, viewport and viewing transformation.
- (f) Write different methods by which polygon surface can be represented in computer graphics.
- (g) Explain RGB colour model.
- (h) Differentiate between object space and image space algorithm.

**PART B**

(4 × 15 = 60)

- II. Explain Bresenham's line drawing algorithm. Illustrate with the help of two sample points.
- OR**
- III. Explain the ellipse generating algorithm with suitable example.
- IV. Write in detail about
    - (i) Cohen – Sutherland line clipping algorithm.
    - (ii) Sutherland-Hodegnan polygon clipping algorithm
- OR**
- V. Explain the basic two dimensional transformation with examples. Give the transformation matrices for each of them.
- VI. Explain Bezier curves and its properties
- OR**
- VII. Explain  $\beta$ -splines and their properties.
- VIII. Explain any three visible surface detection algorithm.
- OR**
- IX. Explain the polygon rendering methods.

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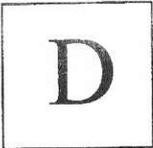
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***B.Tech. Degree V Semester Special Supplementary  
Examination June 2014***

**IT/CS 505 DATABASE MANAGEMENT SYSTEMS**  
(2006 Scheme)

Time : 3 Hours

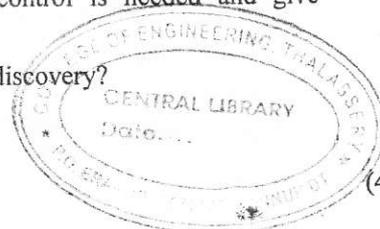
Maximum Marks : 100

**PART A**  
(Answer *ALL* questions)

(8 x 5 =40)

- I. (a) What are the responsibilities of the DBA and the database designers?  
(b) What is the difference between logical data independence and physical data independence? Which one is harder to achieve? Why?  
(c) Discuss the advantages and disadvantages of using (a) an unordered file, (b) an ordered file and (c) a static hash file with buckets and chaining. Which operations can be performed efficiently on each of these organizations?  
(d) Why can we have at most one primary or clustering index on a file, but several secondary indexes?  
(e) Define primary key, super key, candidate key and referential key.  
(f) What is meant by the completeness and soundness of Armstrong's inference rules?  
(g) What is meant by the concurrent execution of database transactions in a multiuser system? Discuss why concurrency control is needed and give examples.  
(h) What are the goals of data mining and knowledge discovery?

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**PART B**

(4 x 15 = 60)

- II. (a) Describe the three-schema architecture and its components. Why do we need mappings between schema levels? (8)  
(b) What is a relationship type? Explain the differences among a relationship instance, a relationship type, and a relationship set with example. (7)

**OR**

- III. (a) What is a weak entity set? Explain the difference between a weak and a strong entity-set. (7)  
(b) Write short notes on the following with an example. (8)  
(i) subclass and super class  
(ii) specialization and generalization.

- IV. (a) Explain the limitations of static hashing. Explain how this is overcome in dynamic hashing. (8)  
(b) Discuss placing file records on disk. (7)

**OR**

(P.T.O.)

- V. (a) Write a note on indexed sequential files. (8)  
(b) What are the differences among primary, secondary and clustering indexes? Explain. (7)
- VI. (a) What is relational algebra? Explain the fundamental operations in relational algebra. (7)  
(b) Consider the employee database given below: (8)  
*Employee (employee-name, street, city)*  
*Works (employee-name, company-name, salary)*  
*Company (company-name, city)*  
*Manages (company-name, manager-name)*  
Give an expression in SQL for each of the following queries:  
(i) Find the names of all employees who work for First Bank Corporation  
(ii) Find the names and cities of residence of all employees who work for First Bank Corporation.  
(iii) Find the names, street addresses and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000.  
(iv) Find all employees in the database who live in the same cities as the companies for which they work.

OR

- VII. (a) What is normalization? Explain 1NF, 2NF and 3NF techniques with suitable examples and compare BCNF and 3NF. (7)  
(b) What is trivial and non trivial functional dependency? Explain the closure of set of attributes with algorithm. Find the closure of attributes of (AB) given relation R with attributes A, B, C, D, E, F and FDs (8)  
 $A \twoheadrightarrow BC$   
 $E \twoheadrightarrow CF$   
 $B \twoheadrightarrow E$   
 $CD \twoheadrightarrow EF$

- VIII. (a) What is meant by transaction? Explain the ACID properties of transaction. (7)  
(b) What is a serial schedule? What is a serializable schedule? Why is a serial schedule considered correct? Why is a serializable schedule considered correct? (8)

OR

- IX. (a) Explain any two concurrency control techniques used in transaction. (7)  
(b) Explain the concept of shadow paging with a suitable example. (8)

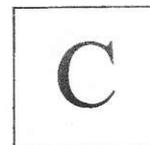
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***B.Tech. Degree V Semester Special Supplementary  
Examination June 2014***

**IT 506 KNOWLEDGE ENGINEERING  
(2006 Scheme)**

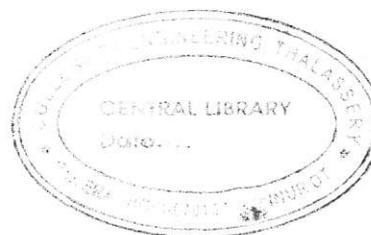
Time : 3 Hours

Maximum Marks : 100

**PART A**  
(Answer *ALL* questions)

(8 × 5 = 40)

- I. (a) What is nonmonotonic reasoning? Explain the architecture of a TMS.  
(b) Explain inference rules of propositional calculus.  
(c) Explain simple hill climbing algorithm.  
(d) Explain breadth first search and depth first search algorithms.  
(e) Explain basic list manipulation functions in LISP.  
(f) Explain the syntax of defining functions in LISP.  
(g) Explain supervised learning.  
(h) Explain the architecture of artificial neural network.



**PART B**

(4 × 15 = 60)

- II. (a) What is resolution? Explain algorithm for propositional resolution. (7)  
(b) Write and explain clausal conversion procedure. (8)
- OR**
- III. Explain knowledge representation issues. (15)
- IV. (a) Explain best first search algorithm. (8)  
(b) What is heuristic search? Explain admissibility, monotonicity and informedness of a heuristic. (7)
- OR**
- V. (a) What is an intelligent agent? Explain the architecture of an agent. (7)  
(b) What is learning? Explain classification of learning strategies. (8)
- VI. (a) What is an S-expression in LISP? What are the constructs for local variables? (5)  
(b) Explain input output functions in LISP. (5)  
(c) Define a function in LISP to find the largest of three numbers. (5)
- OR**
- VII. (a) Explain predicate functions in LISP. (4)  
(b) Explain conditional constructs in LISP. (4)  
(c) Explain the structured form of iterative construct DO and use DO construct to find the factorial of a number. (7)
- VIII. (a) Explain the architecture of feed forward neural networks (8)  
(b) Explain the architecture of Hopfield networks. (7)
- OR**
- IX. (a) Explain the architecture of back propagation network. (8)  
(b) Explain back propagation training algorithms. (7)

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