G 2135

(Pages : 2)

Reg. No..................................

Name..

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Computer Science and Engineering

OPERATING SYSTEMS (R)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Explain how OS uses multiprogramming to implement time-sharing.

2. Write notes on real time operating system.

3. What are the various operations performed on a process ?

4. What is a process table ? Explain the various fields present in it.

5. What is a rousable graph model ? How is it different from the consumable graph model ?

6. Explain the various methods of recovering from dead lock.

7. What is the cause of thrashing ? How does the system detect thrashing ? Once it detects thrashing, what can the system do to eliminate this problem.

8. Differentiate internal and external fragmentation.

9. Explain the different ways of representing directories.

10. With an example, explain the working of look algorithm.

(10 × 4 = 40 marks)

Part B

11. (a) Draw and explain the architecture of UNIX system.

Or

(b) With a neat sketch, discuss the structure of windows 2000 OS.

12. (a) Describe the difference among short-term, medium-term and long-term scheduling with suitable examples.

Or

(b) Explain how process creation, deletion and scheduling is done under a UNIX environment.

Turn over

13. (a) (i) What are the major drawbacks of busy wait implementation of semaphore primitives ? Explain a technique to alleviate these drawbacks.

                           (8 marks)

       (ii) What are the two ways to achieve interprocess communication in multiprocessor environment ?

                           (4 marks)

Or

(b) Consider the bourded-buffer producer/consumer problem. Give the complete statement of the problem. Derive a synchronization protocol using semaphores.

14. (a) Write short notes on :

       (i) Compaction ;

       (ii) Protection and sharing in segmentation.

Or

(b) (i) With a neat diagram explain paging.

                           (8 marks)

       (ii) When do page fault occur ? Describe the actions taken by the OS when a page fault occurs ?

                           (4 marks)

15. (a) Explain the different types of file allocation methods giving their merits and demerits.

Or

(b) Describe the physical characteristics of various storage devices.

                           [5 × 12 = 60 marks]

G 2144 (Pages : 2) Reg. No...............................

Name.............................

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

DATABASE MANAGEMENT SYSTEM (R, T)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours   Maximum : 100 Marks

Answer **all** *the questions.*

Part A

1. Write a short note on the three schema architecture of Database system.

2. Mention the characteristics of Database system over traditional file processing system.

3. Explain the binary relational algebraic operators with an example for each.

4. Explain the concept of views in SQL.

5. Write a note on cost-based Query optimization.

6. Write an anonymous PL/SQL program to read a student record with roll number, name, m1, m2 and m3 and calculate the total, average and grade (pass/fail) and print the result onto the screen.

7. Explain how data integrity is ensured is a Database management system.

8. Describe how anomalies could be eliminated during normalization.

9. Explain the various transparencies in distributed Database.

10. Compare the primary site method with the primary copy method for concurrency control. How does the use of backup sites affect each ?

                      (10 × 4 = 40 marks)

Part B

11. (a) Explain with a neat sketch the architecture of the following data models :–

    (i) Hierarchical   (ii) Network.

              Or

   (b) Construct an ER diagram of the book club. The book club has members. The book club sells books to its members. The members places orders for books, which the book club fulfills. Each order contains one or more than one book. Authors write the books. The publisher publishes the book. An author can write more than one book and a book can have more than one author. A book is published by a publisher, but a publisher publishes many books. (Include attributes, cardinality, participation and weak entities if any).

                                Turn over

12. (a) Describe the six clauses in the syntax of an SQL query, and show what type of constructs can be specified in each of the six clauses. Which of the six classes are required and which are optional ?

Or

(b) (i) In what sense does relational calculus differ from relational algebra, end is what sense are they similar ?

(5 marks)

(ii) Discuss the meanings of the existential quantifier ($\exists$) and the universal quartifier ($\forall$) with examples.

(7 marks)

13. (a) Explain the need for concurrency control and recovery in transaction processing.

Or

(b) Classify the business rules available is Oracle and illustrate with an example for each.

14. (a) What is functional dependency ? Discuss the three Armstrong's inference rules.

Or

(b) (i) Define lNF, 2NF and 3NF.   (5 marks)

(ii) Define BCNF. How does it differ from 3NF ? Why is it considered a stronger form of 3NF.

(7 marks)

15. (a) What are the advantages of DDBMS over centralized DB system ? Explain.

Or

(b) Write notes on :

(i) Distributed Query processing using semi-join.   (6 marks)

(ii) Data Fragmentation.   (6 marks)

[5 × 12 = 60 marks]

G 2163

Reg. No..................................

Name.....................................

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Computer Science and Engineering/Information Technology

LANGUAGE PROCESSORS (R, T)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours   Maximum : 100 Marks

Part A

*Answer **all** questions.*
Each question carries 4 marks.

1. Define a Compiler and Assembler.

2. What are the tables created during compilation ?

3. Explain the formula of a macro.

4. What is a Parser ?

5. Define content free grammar.

6. What is static storage allocation ?

7. What is meant by intermediate code ?

8. Define Linking and Loading.

9. What are Linkage editors ?

10. What are the functions of overlays ?

(10 × 4 = 40 marks)

Part B

*Answer **all** questions.*
Each question carries 12 marks.

11. (a) Explain a two Pass assembler and clearly explain what happens in the two passes.

Or

(b) Discuss the Design of a Macro-pre-processors.

12. (a) Explain how the type checking of expressions and statements are done.

Or

(b) Using examples explain the lexical and syntax analysis are done.

Turn over

13. (a) Explain storage allocation and access in block structured languages are done.

Or

(b) What is meant by array allocation and access ? Compilation of Expressions.

14. (a) Discuss the code optimization and global optimization.

Or

(b) What is an incremental compiler and its functions ?

15. (a) Explain relocation loaders and linking process.

Or

(b) What is meant by Dynamic loading and Loading schemes.

(5 × 12 = 60 marks)

G 2170 (Pages : 2) Reg. No...../ copy................

Name....................................

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

DATA COMMUNICATION (RT)

(Supplementary/Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Write down the mathematical representation of FM. Explain each term.

2. Compare and contrast PPM with PWM.

3. What is multiplexing ? Explain its role in communication.

4. State and explain Shannon's source coding theorem.

5. Differentiate synchronous and asynchronous data transmission methods.

6. Define circuit switching. Explain its merits and demerits.

7. What is a block code ? Explain with an example.

8. Write short notes on EBCDIC codes.

9. With block diagram list the components of a computer communication system.

10. With cross-sectional structure explain the operation of a coaxial cable.

(10 × 4 = 40 marks)

Part B

11. With block diagram, explain the generation of AM wave. Sketch an AM wave for 50 % modulation for a given modulating signal of 5 V peak-to-peak.

Or

12. Describe the advantages of digital modulation schemes over analog modulation schemes. Explain the principle of Pulse Code Modulation.

13. Explain in detail the statistical time division multiplexing scheme with suitable sketches. Compare it with synchronous TDM scheme.

Or

14. With diagram, explain the method of differential phase shift keying. Compare its performance with PSK.

15. Explain in detail serial and parallel data transmission schemes. List advantages and disadvantages of both.

Or

16. Explain the operation of packet switching scheme. List its advantages and disadvantages of over message switching.

17. With block diagram, explain the operation of a convolution encoder.

Or

18. What are barcodes ? Explain its scientific and commercial applications.

19. Explain the role of terminal handling equipment in computer communication. Describe point to point and multidrop lines.

Or

20. Briefly explain about the GSM services and architecture.

(5 × 12 = 60 marks)

G 2129 (Pages : 3) Reg. No..................................

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B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Computer Science and Engineering/Information Technology

ENGINEERING MATHEMATICS – IV (R, T)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours Maximum : 100 Marks

Answer **one** *question from each module.*
All questions carry equal marks.

Module I

1. (a) Obtain the system of steady state equations and hence find the value of P in usual notations where (i) $n < s$; (ii) $n \geq s$.

(10 marks)

 (b) A supermarket has two girls ringing up sales at the counters, if the service time for each customer is exponential with mean 4 minutes and if the people arrive in a Poisson fashion at the rate of 12 per hour (i) what is the probability of having to wait for service ? (ii) what is the expected percentage of idle time for each girl ? (iii) what is the expected length of waiting time ?

(10 marks)

Or

2. (a) Describe the queueing models M|M|I|S and M|M|I|N. (10 marks)

 (b) A car park contains 5 cars. The arrival of cars is Poisson at a mean ratio of 10 per hour. The length of time each car spend in car park is negative exponential distribution with mean of 2 hours. How many cars are in the car park on average ?

(10 marks)

Module II

3. (a) Using Horner's method find the root of $x^3 + 9x^2 - 18 = 0$ correct to 2 decimal places.

(10 marks)

 (b) Solve by Gauss Seidel method :

$5x + 2y + z = 12$; $x + 4y + 2z = 15$; $x + 2y + 5z = 20$.

(10 marks)

Or

Turn over

4. (a) Solve by regula falsi method $e^x \sin x = 1$ correct to 2 decimals.   (10 marks)

   (b) Solve by Jacobi's method :

   $5x - y + z = 10; 2x + 4y = 12; x + y + 5z = -1.$

   (10 marks)

Module III

5. (a) Find y at $x = 43$ using the following data :

x	40	50	60	70	80	90
y	184	204	226	250	176	304

   (10 marks)

   (b) Find $y'(0)$ and $y''(0)$ from the following :—

x	0	1	2	3	4	5
y	4	8	15	7	6	2

   (10 marks)

Or

6. (a) Using Lagrange's method find y when $x = 10$ using the following :—

x	5	6	9	11
y	12	13	14	16

   (10 marks)

   (b) Evaluate $\int_0^{10} \dfrac{dx}{1+x^2}$ using Simpson's $\dfrac{3}{8}$ rule.   (10 marks)

Module IV

7. (a) Solve graphically :

   Maximize $Z = 2x_1 + x_2$

   subject to $3x_1 + 2x_2 \leq 12$; $x_1 + 2x_2 \leq 7$, $x_1 + x_2 \leq 5$.

   (10 marks)

   (b) Using Simplex method solve :

   Minimize $Z = 3x_1 + 5x_2 + x_3$

   subject to $3x_1 + 4x_2 - 5x_3 \leq 8$; $2x_1 + 6x_2 + x_3 \geq 7$, $x_1 - 2x_2 + x_3 \leq 5$, $x_1, x_2, x_3 \geq 0$.

   (10 marks)

Or

8. (a) Find the maximum of $z = 6x + 8y$

   subject to $5x + 2y \leq 20$; $x + 2y \leq 10$, $x, y \geq 0$

   by solving its dual problem.

   (10 marks)

   (b) Solve by Big m method

   Maximize $Z = x_1 + 2x_2 + 3x_3 - x_4$

   subject to $x_1 + 2x_2 + 3x_3 = 15$, $2x_1 + x_2 + 5x_3 = 20$; $x_1 + 2x_2 + x_3 + x_4 = 10$.

   (10 marks)

Module V

9. (a) Explain the difference between Transportation and Assignment problems.   (8 marks)

   (b) Solve the following transportation problem :—

		P	Q	R	S	Supply
	A	21	16	25	13	11
Source	B	17	18	14	23	13
	C	32	17	18	41	19
Demand		6	10	12	15	43

   Destination

   (12 marks)

Or

10. (a) Define feasible solution, basic solution, non-degenerate solution and optimal solution in a transportation problem.

    (8 marks)

    (b) Solve by Vogels method :

		A	B	C	D	E	F	Available
	1	9	12	9	6	9	10	5
Factory	2	7	3	7	7	5	5	6
	3	6	5	9	11	3	11	2
	4	6	8	11	2	2	10	9
Requirement		4	4	6	2	4	2	

    Warehouse

    (12 marks)

G 2153   (Pages : 2)   Reg. No..................................

Name....................................

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Computer Science and Engineering

FILE STRUCTURES AND ALGORITHMS (R)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours   Maximum : 100 Marks

*Answer **all** questions.*

Part A

Each question carries 4 marks.

1. What are the common operation on files ?

2. Distinguish between physical and logical files.

3. What are the advantages of sequential search ?

4. What is meant by multilevel indexing ?

5. Explain hash functions.

6. What is collision ? How it is resolved ?

7. What are AVL trees ? Explain.

8. Explain threaded binary trees.

9. What is compaction ? Explain.

10. Explain buddy system.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. (a) Explain secondary key retrieval in file orgnaisation.

Or

    (b) Briefly explain the structure of indexed sequential files.

12. (a) Write an algorithm for interpolation search ? Explain the complexity and bring out its advantages over other searches.

Or

    (b) Briefly explain the types of single level ordered indexes.

Turn over

13.   (a)   Explain static and dynamic Hashing. What are its advantages ?

Or

     (b)   Explain with algorithm the search and insertion functions for an ordered Hash table.

14.   (a)   With an algorithm, explain how balancing is done in a weight balanced tree.

Or

     (b)   What is a B⁺ tree ? Explain with algorithm how insertion and deletion of items takes place in a B⁺ tree.

15.   (a)   Explain the first fit and best fit with suitable examples. Bring out the advantages of both.

Or

     (b)   Explain briefly how storage allocation and liberation is done in storage management.

                                              (5 × 12 = 60 marks)