F 9199 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Fifth Semester

Branch : Computer Science and Engineering

OPERATING SYSTEMS (R)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Explain the different functions of Kernel of an Operating system.
2. What is batch processing ?
3. Explain preemptive scheduling and non preemptive scheduling.
4. What are the advantages of Multithreading ?
5. Explain precedence graphs.
6. What are monitors ?
7. What are overlays ?
8. Explain demand paging.
9. Explain the functions of channel control units.
10. What are virtual devices ?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Explain the general structure of MS-DOS operating systems.

Or

(b) What are the different subsystems of operating system ? Explain the functions of each.

12. (a) Explain the different process scheduling algorithms.

Or

(b) Explain how process management is implemented in UNIX operating system.

Turn over

13. (a) Give an account of deadlock prevention mechanisms.

Or

(b) Explain critical section problem. Discuss the two process solution suggested by Peterson.

14. (a) Discuss the different page replacement algorithms.

Or

(b) Explain segmentation with paging.

15. (a) Discuss the different disk scheduling algorithms.

Or

(b) What are the different file protection mechanisms ?

(5 × 12 = 60 marks)

F 9208 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

DATABASE MANAGEMENT SYSTEM (R, T)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What is meant by the terms entity and attribute ? What are the different types of attributes ?
2. Briefly explain the concept of an object oriented data model.
3. What is meant by a relational database schema ? When is a relational database considered to be in a valid state ?
4. Explain the concept of referential integrity in a relational database. How is it enforced ?
5. What is meant by the system log of a database ? What is its utility ?
6. Explain the desirable properties of a transaction.
7. What is meant by a transitive dependency ? Explain with examples.
8. Explain the concept of a full functional dependency with an example.
9. Explain the concept of data transparency in a distributed database. What are the different kinds of transparencies ?
10. What is meant by data fragmentation ? Discuss the different types of fragmentation.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Explain the components modules of a DBMS with neat diagram.

Or

(b) Write notes on the concept of data independence in a database. Explain the three schema architecture for database systems.

Turn over

12. (a) Explain the tuple relational calculus with suitable examples.

Or

(b) Give an overview of the different data definition and manipulation operations possible with SQL with suitable example queries.

13. (a) Write notes on serial and non serial schedules of transactions. What is meant by the term serializability in the context of schedules ?

Or

(b) What is meant by a timestamp ? Explain the timestamp ordering algorithm used to implement concurrency among transactions in a database.

14. (a) What is meant by a join dependency ? Write notes on 4NF and 5NF.

Or

(b) What is meant by the closure of a set of functional dependencies on a relation ? List and explain the algorithm for determining the same. Determine the closure of the following set F of functional dependencies for relation schema R = {A, B, C, D, E}. F = {A $\rightarrow$ BC, CD $\rightarrow$ E, B $\rightarrow$ D, E $\rightarrow$ A}. List the candidate keys for R.

15. (a) Write notes on the distributed two phase commit protocol.

Or

(b) Discuss the different possible locking protocol schemes in a distributed database.

(5 × 12 = 60 marks)

F 9217

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Fifth Semester

Branch : Computer Science and Engineering

FILE STRUCTURES AND ALGORITHMS (R)

(Regular/Improvement/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A

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

1. How to classify files ?
2. Why do we go for "Keys" based file handling ?
3. What is meant by "indexed structure" for files ?
4. What is Static Hashing ?
5. Define height of a Balanced Tree.
6. Explain pre-order and post order.
7. How does B^+ tree help in Heavy searching ?
8. What is a Buddy system ?
9. Explain closed hashing.
10. What are first-fit and Best-fit allocation strategies ?

(10 × 4 = 40 marks)

Part B

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

11. What are the differences in file operations of Heap files and sequential Indexed files ?

Or

12. Explain data retrieval methods in Indexed and Direct files.
13. How does multi-level indexing and signal level indexing differ in applications with their relative complexity measures ?

Or

14. Explain the use of Keys in relation to file structures and file operations.

Turn over

15. What are the methods available for Collision Resolution ? Explain with example.

Or

16. What are Mid-square division in relation to the Hash function generators and applications ?

17. Explain any *one* algorithm for Binary Tree Generation.

Or

18. Discuss advantages of B-Trees and B^+ Trees.

19. Explain the Dynamic storage management and compaction.

Or

20. What is storage allocation and liberation in storage management ?

(5 × 12 = 60 marks)

F 9227 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

LANGUAGE PROCESSORS (RT)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What is macro assembler ?
2. What is the output of the assemble ? What further processing is required so that an executable code is produced ?
3. Explain the function of translators.
4. What do you mean by context free grammars ?
5. Write a short note on dynamic storage location.
6. What do you mean by array allocation ?
7. What is back patching ? When does it occur ? What is the need for backpatching ?
8. What is Yace ? How does it work ? What it is I/P and O/P ?
9. How to linkage editors handle the runtime environment ?
10. What is dynamic loading ? List the uses of it.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Discuss in detail about the macro definition and its usage.

Or

(b) Discuss in detail about the design of a macro pre-processor and macroassembler.

12. (a) Discuss in detail about the lexical and syntax analysis with suitable examples.

Or

(b) Write technical note on :

(i) Recursive decent parser.

(ii) Shift reduce parser.

Turn over

13. (a) Explain in detail about the data descriptors and storage allocation.

Or

(b) Explain with suitable examples, about the compilation of expressions and intermediate code forms for expressions.

14. (a) Write a technical note on :

(i) Conditional and iterative constructs.

(ii) Code optimization.

Or

(b) Discuss in detail about compiler writing tools and incremental compilers.

15. (a) What is program relocatability ? Discuss in detail about the various loading schemes.

Or

(b) Write a technical note of the following :—

(i) Overlays.

(ii) Dynamic loading and linking.

(5 × 12 = 60 marks)

F 9234 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

DATA COMMUNICATION (RT)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. (a) What is the need for modulation ?
   (b) Enumerate the advantages of digital pulse modulation techniques.
   (c) Distinguish between synchronous TDM and statistical TDM.
   (d) Describe the signalling scheme that is widely used for lowspeed digital data transmission systems.
   (e) How is half duplex mode different from full duplex mode of transmission.
   (f) What is the effect of noise in digital data transmission ?
   (g) How is Hamming code used for error detection and correction ?
   (h) Describe the significance of bar codes in communication.
   (i) What is the function of a concentrator ?
   (j) What are the advantages of using fibre optic cables ?

(10 × 4 = 40 marks)

Part B

Answer **either** *(a)* **or** *(b) questions.*
Each question carries 12 *marks.*

2. (a) Differentiate between Frequency modulation and Phase modulation with neat waveforms.

Or

   (b) Describe the different types of analog pulse modulation techniques with neat diagrams.

3. (a) Differentiate between FDM and TDM with neat waveforms.

Or

   (b) Explain in detail the different methods in which digital information can be impressed upon the carrier wave.

Turn over

4. (a) Briefly explain the different modes of transmission used in digital data communication.

Or

(b) Describe in detail about the different types of noise that may be encountered during data transmission.

5. (a) Briefly describe the different transmission codes that are used.

Or

(b) Briefly describe in detail the difference between the block codes and the convolution codes.

6. (a) Describe the different methods of terminal handling in computers.

Or

(b) Explain the different technique of data transmission using GSM.

(5 × 12 = 60 marks)

F 9193 (Pages : 3) Reg. No.....CS

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

ENGINEERING MATHEMATICS—IV (R T)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

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

Module I

1. (a) For M|M|1 queueing system, derive the expression for (i) P_n and P_o ;(ii) Average number of customers in the system ; (iii) Average queue length ; (iv) Find the probability that at least ten customers in the system.

(12 marks)

(b) Consider a self service store with one cashier. Assume Poisson arrivals and exponential service times. Suppose that eight customers arrive on the average of five minutes and the cashier can serve 10 in 5 minutes. Find (i) the average number of customers queueing for service ; (ii) probability of having at least 10 customers in the system.

(8 marks)

2. (a) For M|M|M queueing system, find the expression for (i) P_o and P_n and (ii) Average queue length.

(10 marks)

(b) A petrol pump station has two pumps. The service time follows the exponential distribution with a mean of 4 minutes and cars arrive for service in a Poisson process at the rate of ten cars per hour. Find the probability that a customer has to wait for service. What proportion of time the pumps remain idle ?

(10 marks)

Module II

3. (a) Using the bisection method, find a root of $x^3 - x^2 + x - 7 = 0$ correct to three decimal places.

(10 marks)

(b) By using Newton's method, find the root of $x^3 - 3x^2 + 7x - 8 = 0$ correct to three decimal places.

(10 marks)

4. (a) By Horner's method, find the root of the equation $x^3 - 6x - 13 = 0$ in (3, 4) correct to three decimal places.

(10 marks)

Turn over

(b) By Gauss-Seidel iterative method, solve the equations :

$$\begin{aligned} 8x_1 - 3x_2 + 2x_3 &= 20 \\ 4x_1 + 11x_2 - x_3 &= 33 \\ 6x_1 + 3x_2 + 12x_3 &= 35 \end{aligned}$$

correct to three decimal places. (10 marks)

Module III

5. (a) Using Newton's formula, find the value of $f(1.5)$ from the following data :—

x	:	0	1	2	3	4
$f(x)$	:	858.3	869.6	880.9	892.3	903.6

(10 marks)

(b) Using Simpson's rule, evaluate $\int_0^2 \frac{dx}{1+x^3}$ by dividing the range into 10 equal parts. (10 marks)

Or

6. (a) Find the value of the sec 31° using numerical differentiation from the following :—

θ in degrees	:	31	32	33	34
$\tan\theta$	:	0.6008	0.6249	0.6494	0.6745

(10 marks)

(b) Given the values :

x	:	14	17	31	35
$f(x)$	:	68.7	64	44	39.1

Find the value of $f(x)$ corresponding to $x = 27$. (10 marks)

Module IV

7. (a) Using graphical solution method :

Maximize $Z = 3x_1 + 2x_2$

subject to

$$\begin{aligned} 2x_1 - x_2 &\geq -2 \\ x_1 + 2x_2 &\geq 8 \\ x_1, x_2 &\geq 0. \end{aligned}$$

(8 marks)

(b) Using Simplex method :

Maximize $Z = 30x_1 + 23x_2 + 29x_3$

subject to

$$\begin{aligned} 6x_1 + 5x_2 + 3x_3 &\leq 52 \\ 6x_1 + 2x_2 + 5x_3 &\leq 14 \\ x_1, x_2, x_3 &\geq 0. \end{aligned}$$

(12 marks)

Or

8. (a) Using Big M-method :

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

subject to

$$\begin{aligned} x_1 + x_2 + 2x_3 &\leq 5 \\ 2x_1 + 3x_2 + 4x_3 &= 12 \\ x_1, x_2, x_3 &\geq 0. \end{aligned}$$

(10 marks)

(b) Using principle of duality, solve the LPP :

Maximize $Z = 2x_1 + 3x_2$

subject to

$$\begin{aligned} -x_1 + x_2 &\leq 4 \\ x_1 + x_2 &\leq 6 \\ x_1 + 3x_2 &\leq 9 \\ x_1, x_2 &\geq 0. \end{aligned}$$

(10 marks)

Module V

9. Find the optimum solution for the Transportation problem :

	D_1	D_2	D_3	D_4	D_5	Supply
O_1	2	3	5	7	5	17
O_2	4	1	2	1	6	13
O_3	2	8	5	1	3	16
O_4	5	3	7	2	4	20
Demand	16	20	13	12	5	

(20 marks)

Or

10. Solve the following assignment problem and find the minimum assignment cost :

	Jobs			
Persons	1	2	3	4
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

(20 marks)

[5 × 20 = 100 marks]