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06AL61

Sixth Semester B.E. Degree Examination, June/July 2011
Management and Entrepreneurship

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting atleast TWO questions each from Part – A and Part - B.*

PART – A

1   a. Explain the different skills and their importance at different levels of management. (08 Marks)
    b. What are the nature and characteristics of management? (07 Marks)
    c. Distinguish between management and administration. (05 Marks)

2   a. Briefly describe the general principles of management as laid down by Henri Fayol. (08 Marks)
    b. State and explain the steps in decision making. (07 Marks)
    c. Differentiate between strategic and tactical planning. (05 Marks)

3   a. What is line and staff organization? (08 Marks)
    b. Explain the nature and importance of staffing. (07 Marks)
    c. What is MBO? Explain. (05 Marks)

4   a. What are the essentials of sound controlling? (08 Marks)
    b. Explain the importance of leadership in organization. (07 Marks)
    c. What are the barriers of successful communication? (05 Marks)

PART – B

5   a. What are the qualities of entrepreneur? (08 Marks)
    b. Differentiate between entrepreneur, intrapreneur and manager. (07 Marks)
    c. What are the various stages of entrepreneurship process? Explain. (05 Marks)

6   a. Explain the steps involved in setting up of a small scale industry. (08 Marks)
    b. What is the influence of LPG on SSIs? Explain. (07 Marks)
    c. Explain the role of SSI in economic development. (05 Marks)

7   a. What are the objectives and functions of NSIC? (08 Marks)
    b. Narrate the function of SIDO for growth of SSI's. (07 Marks)
    c. What are the objectives of SFC's? (05 Marks)

8   a. Write the need and significance of project report. (08 Marks)
    b. What do you mean by project feasibility study? Explain. (07 Marks)
    c. Define the project. What is its nature? (05 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2011
Unix Systems Programming

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. What are the major differences between ANSI "C" and K and R "C"? Explain with examples. **(08 Marks)**
   b. What do you understand by the term feature test macros? List all the five features test macros along with their meanings. **(06 Marks)**
   c. Write a C++ program to list the actual values of the following system configuration limits on a given unix OS.
   i)   Maximum number of child process that can be created.
   ii) Minimum number of files that can be opened simultaneously.
   iii) Number of clock ticks. **(06 Marks)**

2 a. What are the API common characteristics? List any five values of the global variable errno along with their meanings whenever API's fail. **(06 Marks)**
   b. List and explain the different file types available in unix. **(08 Marks)**
   c. Describe the unix kernel support files. **(06 Marks)**

3 a. Explain the following API's with prototypes :
   i) Open ; ii) Lseek ; iii) Stat ;   iv) Read. **(08 Marks)**
   b. Write a C++ program to implement following unix commands i) *ln* ; ii) mv **(08 Marks)**
   c. Bring out the differences between hardlink and symbolic link. **(04 Marks)**

4 a. What are the different ways for a process to terminate? Explain exit, -exit, atexit functions with its prototypes. **(08 Marks)**
   b. Explain the memory layout of a C program with a neat diagram. **(06 Marks)**
   c. Explain getrlimit and setrlimit functions with prototype. Mention the three rules to change the resource limits. Give four resource values. **(06 Marks)**

PART – B

5 a. What is fork and vfork? Explain with an example program for each. **(08 Marks)**
   b. What is zombic process? Write a C program to avoid zombic process by forking twice. **(06 Marks)**
   c. List the six different forms of exec API's. Write a program that exec's a program echoall to display all the command line and environment variables. **(06 Marks)**

6 a. What is a signal? Mention the different sources of signals. Discuss any four POSIX defined signals. Write a program to setup signal handler for SIGINT and SIGALARM. **(08 Marks)**
   b. What is Daemon? Discuss the basic coding rules. **(08 Marks)**
   c. What is job control? What are three forms of support from the OS required for job control? **(04 Marks)**

7 a. What are pipes? What are their limitations? Write a program to send data from parent to child over a pipe. **(06 Marks)**
   b. What is FIFO? Explain how FIFO can be used to implement client server communication model with an example. **(06 Marks)**
   c. What are the different system calls available to create and manipulate semaphores? Explain. **(08 Marks)**

8 a. What is socket? Discuss how to create and destroy a socket. **(08 Marks)**
   b. Write short notes on: i) Race condition ; ii) Network login ; iii) Message queues. **(12 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2011

Compiler Design

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Discuss the various phases of a compiler. Show the translation for an assignment statement: position = initial + rate * 60. Clearly indicate the output of each phase. **(12 Marks)**
   b. Why buffering is required while recognizing lexemes? Explain how sentinels are handled using buffers. **(08 Marks)**

2 a. Give a formal definition of a CFG. Design a CFG for a simple arithmetic expression. **(06 Marks)**
   b. Define the terms : i) Left recursion   ii) Left factorization. **(06 Marks)**
   c. Define FIRST and FOLLOW rules used in predictive parsing technique. **(08 Marks)**

3 a. What is meant by handle pruning? Show the working of a shift reduce parser for accepting $id_1 * id_2$, considering the grammar :
$$E \rightarrow E + T / T$$
$$T \rightarrow T * F / F$$
$$F \rightarrow id$$
(08 Marks)
   b. What is the meaning of 'L' and 'R' in LR grammars? Why LR parsing is attractive? **(04 Marks)**
   c. Construct LR(0) items for the grammar :
$$E \rightarrow E + T / T$$
$$T \rightarrow T * F / F$$
$$F \rightarrow (E) / id$$
(08 Marks)

4 a. Construct canonical LR(1) items for the augmented grammar :
$$S' \rightarrow S$$
$$S \rightarrow CC$$
$$C \rightarrow cC / d$$
(10 Marks)
   b. How LALR parsing table is constructed? Develop an algorithm for the same. **(10 Marks)**

PART – B

5 a. Define a syntax directed definition. Give SDD for simple type declaration including int and float types. **(08 Marks)**
   b. Construct a dependency graph for the declaration float id_1, id_2, id_3. **(06 Marks)**
   c. Define inherited and synthesized attributes. Give examples for each. **(06 Marks)**

6 a. Explain how DAGs will help in intermediate code generation? Construct a DAG and a three-address-code for the expression $a + a * (b - c) + (b - c) * d$. **(12 Marks)**

 b. For an array 'a' of size 2 × 3 of integers, assume the width of an integer as 4, derive 3-address code for a [i] [j]. **(08 Marks)**

7 a. Discuss the general structure of activation record. **(08 Marks)**

 b. What is meant by calling sequence and return sequence? List calling sequence design principles. **(08 Marks)**

 c. Write a note on Garbage collection. **(04 Marks)**

8 a. List and explain design issues of a code generator. **(10 Marks)**

 b. With an example, explain common subexpression and dead code elimination methods. **(10 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2011
Computer Networks – II

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, Selecting atleast TWO questions from each part.*

PART – A

1 a. Distinguish between connectionless packet switching and virtual circuit packet switching. **(08 Marks)**

b. Consider the network in Fig. Q1(b). Use the Bellman – Ford algorithm to find the shortest paths from all the rodes to the destination node 2. **(05 Marks)**

Fig. 1(b)

c. Explain briefly the structure of a generic packet switch, with the help of a diagram. **(07 Marks)**

2 a. Discuss the different FIFO techniques briefly. **(08 Marks)**

b. A host in an organization has an IP address 150.32.64.34 and a salent mask 255.255.240.0. What is the address of this sulenet? What is the range of IP addresses that a host can have on this sulenet? **(05 Marks)**

c. With the help of a diagram, explain the token bucket traffic shaper for congestion control. **(07 Marks)**

3 a. Give any four differences between IPV4 and IPV6. **(04 Marks)**

b. Explain the significance of the following fields in the TCP segment.
i) Sequence   ii) Acknowledgement number   iii) Checksum   iv) Window size. **(08 Marks)**

c. Discuss in detail, the Routing information protocol. **(08 Marks)**

4 a. Briefly explain the packet formats and functionalities of AAL ¾. **(12 Marks)**

b. Discuss the UNI signaling in ATM network, with an example. **(08 Marks)**

PART - B

5 a. Explain the secret key and public key cryptographic systems, with relevant block diagrams. **(06 Marks)**

b. Apply RSA algorithm for the following :
i) Encrypt the plain tent P = 25 for p = 7, q = 11, e = 17
ii) Find the value of d and decrypt the ciphertext. **(06 Marks)**

c. What is SNMP? Discuss the interactions between the SNMP management station and SNMP agent. **(08 Marks)**

6 a. What is MPLS? Explain how the packets are forwarded using MPLS. **(06 Marks)**

b. Discuss the differentiated services QoS approach. **(08 Marks)**

c. Write a note on virtual private networks. **(06 Marks)**

7 a. Explain the session initiation protocol, in detail. **(10 Marks)**

b. Discuss the Huffman encoding technique. **(10 Marks)**

8 a. Explain the DSDV protocol for mobile Ad – HoC networks. **(10 Marks)**

b. Describe the DEEP clustering protocol for wireless sensor networks. **(10 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2011
Computer Graphics and Visualization

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*
selecting atleast TWO questions from each Part.

PART – A

1   a. What do you mean by a pipeline architecture? With neat diagram, explain each components of geometric pipeline. **(10 Marks)**
    b. What is a graphics system? With neat block diagram describe major components of a graphics system. **(10 Marks)**

2   a. Write a complete openGL program for creating 3D sierpinski gasket by subdivision of a tetrachedron. **(10 Marks)**
    b. Classify the major groups of API functions in OpenGL? Explain any four of them. **(06 Marks)**
    c. What is an attribute with respect to graphics system? List attributes for lines and polygons. **(04 Marks)**

3   a. What is the necessity of programming event–driven input? Describe window events and keyboard events. **(10 Marks)**
    b. What are the features that a good interactive program should include? Describe an OpenGL animating interactive program for the rotating square. **(10 Marks)**

4   a. In a homogeneous coordinate system given two frames (v_1, v_2, v_3, P_0) and (u_1, u_2, u_3, Q_0). Let a and b be two vectors defined in two frames respectively. Derive the expression that represents vector b interms of a. **(08 Marks)**
    b. Along with necessary program segments, explain the modeling of colored cube and bilinear interpolation. **(12 Marks)**

PART – B

5   a. What is concatenation of transformations? Derive concatenated final matrix M for rotating a 3D object about a fixed point. **(08 Marks)**
    b. Consider a 3D cube object, with fixed point is at the centre of the cube and angle of rotation θ about an arbitrary axis defined by two prints P_1 and P_2 defining the vector u. Find the final rotation matrix R. **(12 Marks)**

6   a. Describe flat shading, interpolative and ground shading. θ**(10 Marks)**
    b. With necessary OpenGL program, explain the approximation of sphere by recursive subdivision of a 3D tetrahedron. **(10 Marks)**

7   a. Give differences between object space and image space methods for hidden surface removal? Describe any one method that uses image space for hidden surface removal. **(10 Marks)**
    b. What are four basic types of light sources? Explain each. **(10 Marks)**

8   a. What is the necessity of scan conversion? Describe the digital differential analyzer algorithm for scan conversion of a line segment. **(10 Marks)**
    b. Explain in brief, various display considerations with respect to conversion from vertices to fragments. **(10 Marks)**

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06IS63

Sixth Semester B.E. Degree Examination, June/July 2011
File Structures

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. What are file structures? Explain briefly the history of file structures design.   **(06 Marks)**
    b. Explain seeking with C and C++ streams.   **(04 Marks)**
    c. Explain sector based data organization in magnetic disk.   **(06 Marks)**
    d. Differentiate between constant linear velocity (CLV) and constant angular velocity (CAV).   **(04 Marks)**

2   a. What is a record? Explain different methods for organizing records of a file.   **(12 Marks)**
    b. Write brief notes on :
       i)   Performance of sequential search
       ii)   Direct access.   **(08 Marks)**

3   a. Explain how spaces can be reclaimed in files.   **(10 Marks)**
    b. What is an index? Explain a simple index for entry-sequenced file.   **(10 Marks)**

4   a. What is co-sequential processing and what are the assumptions and components of the model?   **(10 Marks)**
    b. Explain the following:
       i)   K-way merge
       ii)   A selection tree for merging large number of lists.   **(10 Marks)**

PART – B

5   a. Explain with an example the creation of B-trees.   **(10 Marks)**
    b. Explain the following with respect to B-Tree:
       i)   Worst-case search depth
       ii)   Redistribution during insertion.   **(10 Marks)**

6   a. Explain simple prefix B$^+$ tree and the issues involved in maintenance of such trees.   **(10 Marks)**
    b. Explain the internal structure of index set blocks.   **(10 Marks)**

7   a. What is hashing? Explain a simple hashing algorithm.   **(10 Marks)**
    b. What is collision? Explain collision resolution by progressive overflow.   **(10 Marks)**

8   a. Explain the working of extendible hashing.   **(10 Marks)**
    b. Write short notes on:
       i)   Dynamic hashing
       ii)   Linear hashing   **(10 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2011
Information Systems

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Explain the major roles of information systems. Give any two examples and explain.
                                                                  (12 Marks)
   b. Mention the types of information systems and explain.   **(08 Marks)**

2 a. Explain the information system resources and activities.   **(12 Marks)**
   b. Explain components of an information system.   **(08 Marks)**

3 a. Explain the transaction processing system and cycle with example. **(10 Marks)**
   b. Explain HRM systems, HRM and corporate intranets with examples.   **(10 Marks)**

4 a. What is SCM? Explain benefits and challenges of SCM.   **(10 Marks)**
   b. What is ERP? Explain benefits and challenges of SCM and the costs of ERP. **(10 Marks)**

PART – B

5 a. Explain essential e-commerce processes and process architecture. **(10 Marks)**
   b. Explain e-commerce applications and issues.   **(10 Marks)**

6 a. Explain DSS and DSS components.   **(06 Marks)**
   b. Explain on-line analytical processing using DSS.   **(07 Marks)**
   c. Explain web-based knowledge management system.   **(07 Marks)**

7 a. Explain ethical responsibilities of business professionals **(10 Marks)**
   b. Explain:
      i)   Encryption with figure
      ii) Firewalls with figure   **(10 Marks)**

8 a. Explain business/IT planning and architecture.   **(10 Marks)**
   b. Explain global business/IT strategies and applications.   **(10 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2011
Operations Research

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. What are the different phases of OR? Explain them briefly.   (08 Marks)
   b. Define the following with reference to LPP
      i) Unbounded solution. ii) Feasible solution. iii) Slack Variable.   (04 Marks)
   c. ABC firm manufactures three products P_1, P_2 and P_3. The profits are Rs. 30, Rs. 20 and
      Rs. 40 respectively. The firm has two machines M1 and M2 and requires processing time in
      minutes for each machine on each product and total machine available minutes on each
      machine are given below.

Machine	Machine minutes required			Total machine
	P1	P2	P3	minutes available
M1	4	3	5	2000
M2	2	2	4	2500

The firm must manufacture at least 100 P_1's and 200 P_2's and 50 P_3's but not more than
150 P_1's. Setup LP model to solve by simplex method.   (08 Marks)

2 a. Briefly explain assumptions required in Linear programming models.   (05 Marks)
   b. Use graphical method to solve the following:

   Maximize $z = x_1 + \dfrac{x_2}{2}$

   subject to $3x_1 + 2x_2 \leq 12$ (12 Marks)

   $5x_1 \leq 10, \quad x_1 + x_2 \leq 18$

   $-x_1 + x_2 \geq 4, \quad x_1 \text{ and } x_2 \geq 0$

   c. Why is simplex method a better technique than graphical for most real case? Explain
                                                                                 (03 Marks)

3 a. Explain the concept of degeneracy in simplex method.   (04 Marks)
   b. Use penalty method to solve the following LPP

   Minimize $z = 5x_1 + 3x_2$

   Subject to $2x_1 + 4x_2 \leq 12$

   $2x_1 + 2x_2 = 10, \quad 5x_1 + 2x_2 \geq 10$

   $x_1 \text{ and } x_2 \geq 0$ (16 Marks)

4 a. Construct the dual problem for the following LPP

   Maximize $Z = 16x_1 + 14x_2 + 36x_3 + 6x_4$

   Subject to $14x_1 + 4x_2 + 14x_3 + 8x_4 = 21$; $13x_1 + 17x_2 + 80x_3 + 2x_4 \leq 48$

   $x_1, x_2 \geq 0$; x_3 ; x_4 unrestricted.   (06 Marks)

   b. Use revised simplex method to solve the following LPP

   Maximize $z = x_1 + 2x_2$

   subject to $x_1 + x_2 \leq 3, \quad x_1 + 2x_2 \leq 5$ (14 Marks)

   $3x_1 + x_2 \leq 6, \quad x_1, x_2 \geq 0$

PART – B

5 a. Briefly discuss about sensitivity analysis. (06 Marks)

   b. Find the maximum of $z = 6x_1 + 8x_2$

   subject to $5x_1 + 2x_2 \leq 20$

   $x_1 + 2x_2 \leq 10$

   $x_1 \ \& \ x_2 \geq 0$

   by solving its dual problem using simplex method. (14 Marks)

6 a. Define feasible solution, basic feasible solution, non-degenerate solution and optimal solution in a Transportation problem. (06 Marks)

   b. A product is produced by 4 factories F_1, F_2, F_3 and F_4. Their unit production costs are Rs. 2, 3, 1 and 5 respectively. Production capacity of the factories are 50, 70, 30 and 50 units respectively. The product is supplied to 4 stores S_1, S_2, S_3 and S_4, the requirements of which are 25, 35, 105 and 20 respectively. Unit costs of transportation are given below.

Stores Factories	S_1	S_2	S_3	S_4
F_1	2	4	6	11
F_2	10	8	7	5
F_3	13	3	9	12
F_4	4	6	8	3

   Find the transportation plan such that the total production and transportation cost is minimum. (14 Marks)

7 a. Solve the following assignment problem. If it is treated as a salesman problem and the cell entries represent cost in rupees, find the least cost route such that salesman does not visit any city twice.

	A	B	C	D	E
A	–	2	5	7	1
B	6	–	3	8	2
C	8	7	–	4	7
D	12	4	6	–	5
E	1	3	2	8	–

   (14 Marks)

   b. Explain the following
      i) Minimax and Maximin principles.
      ii) Pure and Mixed strategies.
      iii) Two persons zero sum game. (06 Marks)

8 a. Write a brief note on Tabu search algorithm. (04 Marks)

   b. Reduce the following $(2 \times n)$ game to (2×2) game by graphical method and hence solve.

		B				
		I	II	III	IV	V
A	I	2	-1	5	-2	6
	II	-2	4	-3	1	0

   (08 Marks)

   c. A news paper boy has the following probabilities of selling a magazine

No. of copies sold	10	11	12	13	14
Probability	0.10	0.15	0.20	0.25	0.30

   Cost of a copy is 30 paise and sale price is 50 paise. He can not return unsold copies. How many copies should he order? (08 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2011
Operations Research

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. What are the different phases of OR? Explain them briefly. **(08 Marks)**

b. Define the following with reference to LPP
i) Unbounded solution. ii) Feasible solution. iii) Slack Variable. **(04 Marks)**

c. ABC firm manufactures three products P_1, P_2 and P_3. The profits are Rs. 30, Rs. 20 and Rs. 40 respectively. The firm has two machines M1 and M2 and requires processing time in minutes for each machine on each product and total machine available minutes on each machine are given below.

Machine	Machine minutes required			Total machine minutes available
	P1	P2	P3	
M1	4	3	5	2000
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The firm must manufacture at least 100 P_1's and 200 P_2's and 50 P_3's but not more than 150 P_1's. Setup LP model to solve by simplex method. **(08 Marks)**

2 a. Briefly explain assumptions required in Linear programming models. **(05 Marks)**

b. Use graphical method to solve the following:

Maximize $z = x_1 + \dfrac{x_2}{2}$

subject to $3x_1 + 2x_2 \le 12$ **(12 Marks)**

$5x_1 \le 10, \quad x_1 + x_2 \le 18$

$-x_1 + x_2 \ge 4, \quad x_1 \text{ and } x_2 \ge 0$

c. Why is simplex method a better technique than graphical for most real case? Explain **(03 Marks)**

3 a. Explain the concept of degeneracy in simplex method. **(04 Marks)**

b. Use penalty method to solve the following LPP

Minimize $z = 5x_1 + 3x_2$

Subject to $2x_1 + 4x_2 \le 12$

$2x_1 + 2x_2 = 10, \quad 5x_1 + 2x_2 \ge 10$

$x_1 \text{ and } x_2 \ge 0$ **(16 Marks)**

4 a. Construct the dual problem for the following LPP

Maximize $Z = 16x_1 + 14x_2 + 36x_3 + 6x_4$

Subject to $14x_1 + 4x_2 + 14x_3 + 8x_4 = 21$; $13x_1 + 17x_2 + 80x_3 + 2x_4 \le 48$

$x_1, x_2 \ge 0$; x_3; x_4 unrestricted. **(06 Marks)**

b. Use revised simplex method to solve the following LPP

Maximize $z = x_1 + 2x_2$

subject to $x_1 + x_2 \le 3, \quad x_1 + 2x_2 \le 5$ **(14 Marks)**

$3x_1 + x_2 \le 6, \quad x_1, x_2 \ge 0$

PART – B

5 a. Briefly discuss about sensitivity analysis. (06 Marks)

b. Find the maximum of $z = 6x_1 + 8x_2$

subject to $5x_1 + 2x_2 \leq 20$

$x_1 + 2x_2 \leq 10$

$x_1 \ \& \ x_2 \geq 0$

by solving its dual problem using simplex method. (14 Marks)

6 a. Define feasible solution, basic feasible solution, non-degenerate solution and optimal solution in a Transportation problem. (06 Marks)

b. A product is produced by 4 factories F_1, F_2, F_3 and F_4. Their unit production costs are Rs. 2, 3, 1 and 5 respectively. Production capacity of the factories are 50, 70, 30 and 50 units respectively. The product is supplied to 4 stores S_1, S_2, S_3 and S_4, the requirements of which are 25, 35, 105 and 20 respectively. Unit costs of transportation are given below.

Stores / Factories	S_1	S_2	S_3	S_4
F_1	2	4	6	11
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F_3	13	3	9	12
F_4	4	6	8	3

Find the transportation plan such that the total production and transportation cost is minimum. (14 Marks)

7 a. Solve the following assignment problem. If it is treated as a salesman problem and the cell entries represent cost in rupees, find the least cost route such that salesman does not visit any city twice.

	A	B	C	D	E
A	–	2	5	7	1
B	6	–	3	8	2
C	8	7	–	4	7
D	12	4	6	–	5
E	1	3	2	8	–

(14 Marks)

b. Explain the following
i) Minimax and Maximin principles.
ii) Pure and Mixed strategies.
iii) Two persons zero sum game. (06 Marks)

8 a. Write a brief note on Tabu search algorithm. (04 Marks)

b. Reduce the following $(2 \times n)$ game to (2×2) game by graphical method and hence solve.

		B				
		I	II	III	IV	V
A	I	2	-1	5	-2	6
	II	-2	4	-3	1	0

(08 Marks)

c. A news paper boy has the following probabilities of selling a magazine

No. of copies sold	10	11	12	13	14
Probability	0.10	0.15	0.20	0.25	0.30

Cost of a copy is 30 paise and sale price is 50 paise. He can not return unsold copies. How many copies should he order? (08 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2011
Complier Design

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions selecting*
atleast TWO questions from each part.

PART – A

1   a. With neat sketch explain the structure of complier. **(10 Marks)**
    b. Construct the transition diagram for relational operators (=, <, <=, >, >= and < >). Write a lexical analyzer to recognize the above mentioned relational operators. (write code for START state, one intermediate state and one final state). **(10 Marks)**

2   a. What is left recursion and left factoring? Explain with suitable examples. **(06 Marks)**
    b. Describe the working of a predictive parser and write the parsing table for the grammar
       $S \rightarrow i E t SS' \mid a$
       $S' \rightarrow eS \mid \in$ (epsilon)
       $E \rightarrow b$
       Is this grammar LL(1)? Justify your answer. **(14 Marks)**

3   a. What is handle and handle pruning? How they are used in the STACK implementation of shift reduce parser? Explain with the grammar $E \rightarrow E + E \mid E * E \mid (E) \mid id$ on the input string $w = id_1 + id_2 * id_3$. **(06 Marks)**
    b. Construct SLR(1) parsing table for the following grammar G.
       $S \rightarrow L = R$
       $S \rightarrow R$
       $L \rightarrow *R$
       $L \rightarrow id$
       $R \rightarrow L.$
       Is this grammar SLR(1)–grammar? Justify your answer. **(14 Marks)**

4   a. Write the algorithm for constructing canonical sets of LR(1) items for grammar G. Apply the above algorithm to compute the canonical sets of LR(1) items for the following grammar
       $S \rightarrow CC$
       $C \rightarrow eC \mid d.$ **(14 Marks)**
    b. Compare the relative merits and demerits of LALR, SLR and LR(1). **(06 Marks)**

PART - B

5   a. What are syntax directed definitions (SDDs) and syntax directed translation schemes (SDTs)? With suitable example, explain what are synthesized attributes and inherited attributes. **(08 Marks)**
    b. Give the SDDs and SDTs for parser STACK implementation of desk calculator and explain its working on the input $3 + 4 * 5n$. (Assume grammar with + and * operations) Also write its annotated parse tree. **(12 Marks)**

6 a. What are three address codes? Discuss its quadruples, triples and indirect triples representations. **(06 Marks)**

   b. Consider the assignment statement
       $a = b * - c + b * - c$. Write the sequence of three address codes and give its quadruple, triple and indirect triple representations. **(08 Marks)**

   c. Write the syntax directed definition to build the three address code for an assignment statement 'S' using suitable attributes. **(06 Marks)**

7 a. With neat sketch explain the runtime storage allocation scheme for C++ language on the operating system LINUX. **(08 Marks)**

   b. Write a short notes on the following terms :
       i)   Heap allocation
       ii) Garbage collection
       iii) Displays. **(12 Marks)**

8 a. Discuss the issues in the design of a code generator. **(10 Marks)**

   b. Write the code generator algorithm and explain with suitable example. **(10 Marks)**

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