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Sixth Semester B.E. Degree Examination, June/July 2019

Management and Entrepreneurship

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 functions of managers. (05 Marks)
b. Bring out the difference between management and administration. (05 Marks)
c. Explain different levels of management. (10 Marks)
- 2 a. Briefly explain the steps in decision making. (08 Marks)
b. Explain the hierarchy of plans. (08 Marks)
c. Write difference between strategic planning and tactical planning. (04 Marks)
- 3 a. Discuss any two types of organization structure with a chart highlighting their merits and demerits. (10 Marks)
b. Explain the steps in the selection procedure. (10 Marks)
- 4 a. Briefly explain comparison of Maslow's and Herzberg theories of Human motivation. (10 Marks)
b. Explain the various barriers to communication. (06 Marks)
c. Write difference between coordination and cooperation. (04 Marks)

PART – B

- 5 a. What are the functions of an entrepreneur? (06 Marks)
b. Mention barriers to entrepreneurship. (04 Marks)
c. Who are Intrapreneurs? Explain the differences between Entrepreneur and Intrapreneurs. (10 Marks)
- 6 a. What are the objectives of SSI? (05 Marks)
b. Explain advantages of WTO. (05 Marks)
c. What are the characteristics of SSI? Explain. (10 Marks)
- 7 Write short notes on the following:
a. Karnataka State Finance Corporation (KSFC) (05 Marks)
b. National Small Industries Corporation (NSIC) (05 Marks)
c. Karnataka State Small Industries Development Corporation (KSSIDC) (05 Marks)
d. State Industries Area Development Board of India (SIADBI) (05 Marks)
- 8 a. Explain the need and significance of project report. (05 Marks)
b. Explain various factors to be considered for selection of a project. (05 Marks)
c. What are network analysis techniques? Explain PERT and CPM. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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Sixth Semester B.E. Degree Examination, June/July 2019
Unix System Programming

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. Bring out the major differences between ANSIC and K and R'C'. Explain each with examples. (08 Marks)
- b. Write a C/C++ program to check the following units :
 - (i) Clock ticks.
 - (ii) Maximum number of child process
 - (iii) Maximum path length.
 - (iv) Maximum file name.
 - (v) Maximum number of files can be opened. (08 Marks)
- c. Write any 4 error status codes and their meanings. (04 Marks)
- 2 a. Explain the different file types available in Unix or Posix systems. (10 Marks)
- b. Discuss with a neat diagram the different data structures supported by Unix Kernel for the file manipulation. (06 Marks)
- c. What are the differences between Handlink and Softlink with examples? (04 Marks)
- 3 a. Explain the following API's with their prototype definitions and return values: (i) lseek (ii) fstat (iii) link (iv) fcntl (v) access. (10 Marks)
- b. What are symbolic link file API's? Write a C/C++ program to emulate the unix in command. (10 Marks)
- 4 a. Explain briefly memory layout of C program. (08 Marks)
- b. Write a C/C++ program to demonstrate the use of -atexit(). (08 Marks)
- c. Explain setrlimit and getrlimit with their prototypes. (04 Marks)

PART – B

- 5 a. What is zombic process? Write a C/C++ program to avoid zombic process by forking twice. (10 Marks)
- b. What is controlling terminal? Explain its characteristics and relation to session and process groups. (10 Marks)
- 6 a. What is signal? Explain with a program how to setup a signal handler. (08 Marks)
- b. Explain with suitable example kill function. (06 Marks)
- c. Discuss the daemon characteristics and coding rules. (06 Marks)
- 7 a. What do you mean by pipes? List out their limitations. Write a C/C++ program to send data from parent to child over pipe. (10 Marks)
- b. What is FIFO? Explain how it is used in IPC? Discuss with an example, the client server communication, using FIFO's. (10 Marks)
- 8 Write a short notes on:
 - a. Race conditions.
 - b. Semaphores
 - c. Message queues.
 - d. Alarm and Pause functions. (20 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2019
Compiler Design

Time: 3 hrs.

Max. Marks: 100

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

PART - A

- 1 a. Write a brief note on Language Processing System. (04 Marks)
 b. Explain with a neat diagram, the phases of compiler. (10 Marks)
 c. Construct the transition diagram to recognize the tokens given below :
 i) Relational operation ii) Unsigned number. (06 Marks)
- 2 a. Define Left recursion and Left factoring and apply the same for the Grammar
 $E \rightarrow E * T / T$; $T \rightarrow id + T / id$ (06 Marks)
 b. Given the Grammar
 $S \rightarrow XS | dS | \epsilon$
 $X \rightarrow Y | Zb | aY$
 $Y \rightarrow cZ$
 $Z \rightarrow e$
 i) Construct FIRST and FOLLOW sets.
 ii) Construct the Predictive parsing table.
 iii) Show the moves made by the predictive parser on the input "dace". (10 Marks)
 c. How to verify whether grammar is LL(1) or not, show that
 $S \rightarrow |AB| \epsilon$
 $A \rightarrow |AC|OC$
 $B \rightarrow OS$
 $C \rightarrow 1$ is LL(1) without constructing any table. (04 Marks)
- 3 a. What is handle pruning? Explain with the help of the grammar
 $S \rightarrow (L) | a$
 $L \rightarrow L, S | S$ and input string (a, (a, a)). (04 Marks)
 b. Explain the conflicts that may occur during shift reduce parsing, consider dangling – else grammar. (04 Marks)
 c. Given the grammar
 $S \rightarrow (S) S | \epsilon$ or can be written as
 $S \rightarrow (S) S$
 $S \rightarrow \epsilon$
 i) Find LR(0) items
 ii) Construct SLR(1) parsing table and show the parsing steps for the input () () \$. (12 Marks)
- 4 a. Given the grammar $S \rightarrow CC$; $C \rightarrow cC|d$
 i) Construct sets of LR(1) items.
 ii) Construct Canonical LR(1) Parsing table. (14 Marks)
 b. Write the face specification of a simple desk calculator with the following grammar for arithmetic expressions
 $E \rightarrow E + T | T$
 $T \rightarrow T * F | F$
 $F \rightarrow (E) | digit.$ (06 Marks)

PART - B

- 5 a. Write annotated parse tree for $3 * 5 + 4n$ using top down approach. Write semantic rules for each. (08 Marks)
 b. Write a brief note on dependency graph. (04 Marks)
 c. Construct a dependency graph for the declaration `float id1 , id2 , id3 ,` (08 Marks)
- 6 a. What is DAG? Construct a DAG for the following expression
 $a + a * (b - c) + (b - c) * d$ (05 Marks)
 b. Write annotated parse tree for `C + a [i] [j]` and derive 3 – address code for the same expression. (08 Marks)
 c. Write S.D translation for Switch statement. (07 Marks)
- 7 a. Explain run – time storage scheme for C++ language. Give the structure of activation record and explain the purpose of each item. (10 Marks)
 b. What are access links? Explain how are access links determined for finding non local data, what is its drawback. (06 Marks)
 c. Discuss the performance metrics to be considered while designing a garbage collector. (04 Marks)
- 8 a. Discuss the issues in the design of a code - generator. (10 Marks)
 b. Apply the Code – Generation algorithm to translate the basic block shown below
 $t = a - b$
 $u = a - c$
 $v = t + u$
 $a = d$
 $d = v + u$
 Assume t , u , v are temporaries , local to the block while a , b , c , d are variables that are live on exit from the block. (10 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2019
File Structures

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. What are File Structures? What is the driving force behind the file structure design? (04 Marks)
- b. Explain the sector based organization in magnetic disk with neat diagram. (08 Marks)
- c. Explain the following functions : (08 Marks)
 - (i) Open a file
 - (ii) Reading a file.
- 2 a. What is RRN? Explain how does it support direct access with example. (06 Marks)
- b. Define field and record. Explain different methods for organizing fields of a file with examples. (10 Marks)
- c. List the UNIX tools for sequential processing with example? (04 Marks)
- 3 a. Explain how space can be reclaimed dynamically in fixed length records. (08 Marks)
- b. What are the limitations of key sort method? (02 Marks)
- c. Explain the different operations required to maintain indexed file. (10 Marks)
- 4 a. Explain how consequential processing is implemented in a general ledger program. (10 Marks)
- b. With example, explain k-way merged selection tree for merging large number of lists. (10 Marks)

PART – B

- 5 a. What is B-tree? Explain deletion, merging and redistribution of elements on B-trees. (10 Marks)
- b. What are the advantages and disadvantages of paged binary tree? (04 Marks)
- c. Show the B-tree of order-4 that result from loading the following sets of keys in order:
C S D T A M P I (06 Marks)
- 6 a. Explain the issues in maintenance of single prefix B+ trees with diagram. (10 Marks)
- b. What is indexed sequential access? Explain block splitting and merging due to insertion and deletion in sequence set with example. (10 Marks)
- 7 a. What is hashing? Explain the simple hashing algorithm with example. (10 Marks)
- b. What is packing density? Why it is needed? (04 Marks)
- c. Explain the different collision resolution techniques by progressive overflow. (06 Marks)
- 8 Write short notes on : (20 Marks)
 - a. Extendable hashing
 - b. Pinned records
 - c. CD-ROM Strength and weakness
 - d. Dynamic hashing

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Sixth Semester B.E. Degree Examination, June/July 2019

Computer Networks – II

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. How does packet switching perform better than message switching? Explain with an example. (08 Marks)
- b. What is count-to-infinity problem? How can it be over come? (06 Marks)
- c. What is flooding? What are the steps taken to improve? (06 Marks)

- 2 a. Derive an equation for packet finishing time in Waited Fair Queuing. (06 Marks)
- b. Write the steps of Dijkstra's algorithm. Give an example. (08 Marks)
- c. Suppose that ATM cells arrive at a Leaky bucket policer at times $t = 1, 2, 3, 5, 6, 8, 10, 11, 15$ and 17 . Assume $I = 4$ and $L = 5$. Plot bucket content and identify non-conformity cells. (06 Marks)

- 3 a. Identify the classes of following IP-address:
 - (i) 111.168.70.5 (ii) 199.133.5.81
 - (iii) 139.0.0.99 (iv) 192.168.72.1
 (04 Marks)
- b. What is supernetting? Explain with an example. (06 Marks)
- c. Find the subnet address for the IP : 150.100.12.176 consider 7-bits for host address. (04 Marks)
- d. Compare and contrast IPV₄ with IPV₆. (06 Marks)

- 4 a. What is a silly window syndrome? Propose its solution. (06 Marks)
- b. Explain the working of BGP. (06 Marks)
- c. What do you mean by multicasting? How does database update on pruning? (04 Marks)
- d. What is DHCP? Where is it applied? (04 Marks)

PART – B

- 5 a. How does an address mapping work in DNS? Discuss the two methods. (08 Marks)
- b. What is the protocol used to transmit a file? What are the steps in it?. (06 Marks)
- c. Write a note on: (i) SNMP (ii) Digital signature. (06 Marks)

- 6 a. What do you mean by QoS? Explain QoS architecture in integrated services. (08 Marks)
- b. What are the advantages of VPN? How is Tunneling work? (08 Marks)
- c. What is MPLS? Discuss its packet design. (04 Marks)

- 7 a. A source bandwidth 8 kHz is sampled at Nyquist rate. If the result is modeled using any value from $[-2, -1, 0, 1, 2]$ and corresponding probabilities $[0.05, 0.05, 0.08, 0.30, 0.52]$ then find its entropy. (06 Marks)
- b. What is the purpose of RTP? Discuss the design of its packet. (06 Marks)
- c. Explain the steps of Huffman encoding and perform Huffman encoding for a source generating $\{a_1, a_2, a_3, a_4, a_5\}$ with probabilities $\{0.52, 0.3, 0.08, 0.05, 0.05\}$ respectively. (08 Marks)

- 8 a. Discuss the classification of routing protocols in Adhoc-Network. (04 Marks)
- b. What are the security Vulnerabilities in Adhoc-Network? Explain different types of attack. (08 Marks)
- c. Write a note on: (i) Zigbee technology. (ii) Clustering protocols. (08 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2019
Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. What is Computer Graphics? Briefly explain the applications of computer Graphics. (10 Marks)
- b. With a neat block diagram, explain the graphics pipeline architecture and give the difference between raster and random scanning system. (10 Marks)
- 2 a. What are the graphics functions which give good API support? (08 Marks)
- b. Write an OpenGL recursive program for 3D sierpinski gasket with relevant comments. (12 Marks)
- 3 a. What is measure and trigger of a logical input device? List and explain various input models. (10 Marks)
- b. What are major characteristics that describe the logical behavior of an input device? Explain the various classes of logical input devices supported by OpenGL. (10 Marks)
- 4 a. Explain the different frame co-ordinates in OpenGL, with suitable examples. (10 Marks)
- b. A square in a 2D system is specified by its vertices (6, 6) (10, 6) (10, 10) and (6, 10). Implement the following by its first finding a composite transformation matrix for the sequence of transformation.
 - i) Rotate the square by 45° about its vertex (6, 6)
 - ii) Scale the original square by a factor of 2 about its centre. (10 Marks)

PART – B

- 5 a. What are Affine transformation? Explain the basic affine transformation in 3D along with their matrix forms. (10 Marks)
- b. What are Quaternions? With an example, explain how Quaternion are used in rotation in a 3D space. Give the mathematical representation of Quaternion. (10 Marks)
- 6 a. What are simple projections? Obtain perspective and orthogonal 4×4 matrix representation. (10 Marks)
- b. Briefly explain the projections in OpenGL and demonstrate with the help of a suitable program. (10 Marks)
- 7 a. With neat diagrams, explain various light sources and develop a program for approximation of sphere by recursive subdivisions. (12 Marks)
- b. Explain phong lighting model and explain specification of materials in OpenGL. (08 Marks)
- 8 a. Explain the Cohen-Sutherland line clipping algorithm and demonstrate with the help of an example. (10 Marks)
- b. Explain the scanline polygon filling algorithm.
- c. What is anti-aliasing? List the various anti-aliasing techniques. (05 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2019
Software Testing

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 error, faults and failures in the process of programming and testing with a flow diagram. (04 Marks)
- b. Draw the data flow diagram for a structured triangle program implementation and write pseudo code to solve the triangle problem defined as followed: Accept three integers which are supposed to be three sides of a triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Assume that upper limit for the size of any side in 20. (08 Marks)
- c. Explain the SATM problem statement and SATM screens. (08 Marks)
- 2 a. Derive boundary analysis test cases for commission problem. (08 Marks)
- b. Specify the conditions and derive test cases for neat data function program (third try) using decision table method, make necessary assumptions. (12 Marks)
- 3 a. Justify strongly connected graph is the number of linearly independent circuits in the graph using cyclomatic complexity metric. (08 Marks)
- b. Explain Rapps/Weyuker hierarchy of data flow coverage metrics. (06 Marks)
- c. Explain style and technique to find slice of program. (06 Marks)
- 4 a. With neat diagram, explain the traditional view of testing levels of waterfall life cycle. (08 Marks)
- b. What is decomposition based integration? Define the different types of decomposition based integration. (12 Marks)

PART – B

- 5 a. Explain basic concepts for requirement specification with E – R model and modeling relationship among basic constructs. (10 Marks)
- b. Define taxonomy of interactions. Explain static interactions in single processor and multi processor. (10 Marks)
- 6 a. With a neat diagram, explain the relation of verification and validation activities with respect to artifact produced in software development project. (08 Marks)
- b. List the six principles that characterize various approaches and technique for analysis and testing Explain any three in detail. (07 Marks)
- c. Briefly discuss the dependability properties in process framework. (05 Marks)
- 7 a. Explain the fault-based adequacy criteria in detail. (06 Marks)
- b. Define scaffolding. Distinguish between Generic versus specific scaffolding. (08 Marks)
- c. Describe the test oracle with a neat diagram. (06 Marks)
- 8 a. Briefly explain Quality and process. (06 Marks)
- b. Explain Clean – room process, with neat diagram. (08 Marks)
- c. Describe organizing documents in detail. (06 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2019
Operations Research

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1** a. Explain the six phases of Operations Research study. (08 Marks)
- b. A firm is engaged in producing two products A and B each unit of product A requires 2kg of raw material and 4 labour hours for processing, where as each unit of B requires 3kg of raw materials and 3 labour hours for the same type, every week, the firm has an availability of 60kg of raw material Rs. 96 labour hours. One unit of product A sold yield Rs.40 and unit of product B sold yields Rs. 35 as profit, formulate this as an linear programming problem to determine as to how many units of each product should be produced per week so that firm can earn maximum profit. (06 Marks)
- c. Use graphical method to solve the following :
Minimize $z = -x_1 + 2x_2$
Subject to the constraints $-x_1 + 3x_2 \leq 10$
 $x_1 + x_2 \leq 6$
 $x_1 - x_2 \leq 2$
and $x_1, x_2 \geq 0$. (06 Marks)
- 2** a. Solve the following LPP by using Simplex method :
Maximize $z = 2x_1 - x_2 + x_3$
Subject to the constraints $3x_1 + x_2 + x_3 \leq 6$
 $x_1 - x_2 + 2x_3 \leq 1$
 $x_1 + x_2 - x_3 \leq 2$
and $x_1, x_2, x_3 \geq 0$. (10 Marks)
- b. Explain the concept of Tie breaking in Simplex method. (10 Marks)
- 3** a. Solve the following LPP by using Big M Methods
Minimize $z = 4x_1 + 4x_2 + x_3$
Subject to $x_1 + x_2 + x_3 \leq 2$
 $2x_1 + x_2 \leq 3$
 $2x_1 + x_2 + 3x_3 \geq 3$
and $x_1, x_2, x_3 \geq 0$. (10 Marks)
- b. Solve the following LPP by using two-phase method :
Minimize $z = 2x_1 + 3x_2$
subject to $\frac{1}{2}x_1 + \frac{1}{4}x_2 \leq 4$
 $x_1 + 3x_2 \geq 36$
 $x_1 + x_2 = 10$
and $x_1, x_2 \geq 10$. (10 Marks)

- 4 a. Explain the steps involved in revised Simplex method. (10 Marks)
 b. Use revised simplex method to solve the following LPP :
 Maximize $z = 3x_1 + 5x_2$
 Subject to $x_1 \leq 4$
 $2x_2 \leq 12$
 $3x_1 + 2x_2 \leq 18$
 and $x_1, x_2 \geq 0$. (10 Marks)

PART – B

- 5 a. Explain the parametric analysis with respect to change in c_j and b_j parameters. (10 Marks)
 b. Explain general procedure for sensitivity analysis. (10 Marks)
- 6 a. Find the initial solution to the following transportation problem using VAM : (10 Marks)

		Destination				Supply
		D ₁	D ₂	D ₃	D ₄	
Factory	F ₁	19	30	50	10	7
	F ₂	70	30	40	60	9
	F ₃	40	8	70	20	18
Demand		5	8	7	14	34

- b. Explain Hungarian algorithm with example. (10 Marks)
- 7 a. Solve the following game by graphical method :

		Player B		
		B ₁	B ₂	B ₃
Player A	A ₁	1	3	11
	A ₂	8	5	2

- b. With reference to game theory define the following with an example :
 i) Pure strategy ii) Mixed strategy iii) Saddle point
 iv) Payoff matrix v) Two-person-zero-sum-game. (10 Marks)

- 8 Explain briefly the following :
 a. Tabu search algorithm
 b. Genetic algorithm
 c. Metaheuristics
 d. Simulated annealing algorithm. (20 Marks)