

Code: 9A04602

III B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2013

MICROPROCESSORS & MICROCONTROLLERS

(Common to EEE, ECE, CSE, EIE & E.Con.E)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Why the lower order address bus is multiplexed with data bus? How they will be demultiplexed?
(b) Differentiate between maskable and non-maskable interrupts.
- 2 (a) Write an ALP in 8086 to check the number is prime or not.
(b) Write an ALP in 8086 to convert un packed BCD to packed BCD.
- 3 (a) Draw the memory write machine cycle in minimum mode and explain the operation in each T state.
(b) Draw and explain the memory write machine cycle in maximum mode.
- 4 (a) Explain how to interface a stepper motor with 4-step input sequence to 8086 based system with the help of hardware design. Write the instruction sequence to move the stepper motor 10 steps in clockwise and 12 steps in anti-clockwise direction.
(b) Write in detail about stepper motor and actuators and their interface with 8086.
- 5 (a) What are the applications of 8251? Whether write operation is possible with status word & command word registers.
(b) Distinguish between asynchronous and synchronous data transfer schemes.
- 6 (a) Draw the block diagram of 8253 and explain about each block in detail.
(b) Explain about control word format and programming of 8253.
- 7 (a) Explain in brief about programming external hardware interrupts in 8051.
(b) What are the steps involved in programming the 8051 to receive data serially?
- 8 (a) Explain the importance of each pin in MCS-96 microcontrollers.
(b) Give a short note on 80196 micro controller of MCS-96 family.

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- 1 (a) Discuss the memory segmentation in 8086 microprocessor.
(b) Briefly explain the architecture of 8086 microprocessor with a neat sketch.
- 2 Assume that the symbol table starting at location TABLE consists of 100 entries. Each entry has 80 bytes with the first 8 bytes representing the name field and the remaining 72 bytes representing the information field. Write an instruction sequence to search this table for a given name of 8 characters stored in NAME. If the name is found, copy the associated information into INFO, otherwise, fill INFO with null characters.
- 3 (a) Explain the control pins used in minimum mode operation.
(b) Differentiate minimum and maximum mode of 8086.
- 4 (a) With neat layout, explain how a microprocessor can be used for data acquisition system using A/D converters and D/A converters.
(b) Explain in detail about the interrupt structure of 8086 microprocessor.
- 5 (a) What is the significance of SYNC DETECT & BREAK DETECT signals in 8251?
(b) Define command word & status word register of 8251.
- 6 (a) Draw the pin diagram of 8259 and explain briefly about the function of each pin.
(b) Draw the internal block diagram of 8259 and explain about each block.
- 7 (a) Write program to load accumulator, DPH & DPL using 8051.
(b) Write short notes on the use of control signals \overline{WR} and \overline{RD} .
- 8 Explain address mapping and memory mapping in detail about MCS-96 micro controllers.

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- 1 (a) Discuss the various addressing modes of 8086. What are displacement, base and index? What is an effective address or offset?
(b) What are the advantages of the instruction queue in 8086?
- 2 (a) Write an ALP to separate and count the numbers from positive negative and zero numbers from a given set of 8 bit numbers.
(b) Write an ALP in 8086 to convert packed BCD to unpacked BCD.
- 3 (a) Explain in brief the need for DMA controller and its working in an 8086 based system.
(b) Differentiate minimum and maximum mode of 8086.
- 4 (a) Draw the schematic diagram of 8255 PPI and explain different modes of operation of 8255 with example.
(b) Draw the block diagram of 8255 and explain each block.
- 5 (a) What is parity error, over run error & frame error in 8251? What is hunt mode in 8251?
(b) Explain about USB with necessary example & analysis.
- 6 (a) Explain the modes of operation of 8253 in detail.
(b) Why do we prefer interrupt driven data transfer than programmed I/O transfer? Show the complete hardware design to resolve the multiple interrupts based on priority.
- 7 (a) What is assembly language program? What is the function of SWAP? What is debugging?
(b) Write a program to subtract the contents of R1 of Bank 0 from the contents of R0 of Bank 2.
- 8 (a) Describe about versions and cores of ARM microcontrollers.
(b) Give salient features about ARM microcontrollers.

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Time: 3 hours

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All questions carry equal marks

- 1 (a) Write an assembly language program that will examine an ASCII string of 100 characters and replace each decimal digit by a %. The character string starts at STRG.
(b) Explain the prefix instruction format of 8086 processor. Discuss how these instructions are useful in string manipulation.
- 2 (a) Write an ALP in 8086 to multiply two 16 bit numbers and the result is 32 bit.
(b) Write an ALP in 8086 to add two 8 bit ASCII numbers.
- 3 (a) What are the registers available in 8257? What are their functions?
(b) Draw and discuss the status registers of 8257.
- 4 (a) Give the relevant hardware and software for interfacing stepper motor to 8086 based system.
(b) Explain A/D converter interface to 8086 micro processor.
- 5 (a) Define mode word register of 8251 for asynchronous mode.
(b) Define mode word register of 8251 for sync mode.
- 6 (a) With neat block diagram explain the functions of 8259.
(b) Explain the programming sequence of PIC along with flow chart explain each command word in detail.
- 7 (a) Write a program to load accumulator A, DPH and DPL with 30 H.
(b) Write short notes on external interrupts of 8051.
- 8 (a) What is the difference between Interrupt Request (IRQ) and Fast Interrupt Request (FIQ) in ARM? Explain.
(b) Compare the CPSR and SPSR registers formats and their purpose in different modes of ARM processor operations.

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B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

OBJECT ORIENTED ANALYSIS & DESIGN

(Common to CSE, IT & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Explain about principles of modeling in detail.
- 2 (a) Explain about the steps for modeling the distribution and responsibilities with example.
(b) Explain about the steps for modeling the non software things.
- 3 Explain about the different ways of using a class diagram when modeling the static design view of a system.
- 4 Explain about the following:
(a) Messages.
(b) Links.
(c) Sequencing.
- 5 (a) What is a use case? How it differs from the flow of events?
(b) What are the various flows of events in UML?
(c) Enumerate the steps to model the behavior of an element with an example.
- 6 Write a short note on the following:
(a) History states.
(b) Sub states.
(c) Sequential sub states.
(d) Concurrent sub states.
- 7 (a) Enumerate the steps to forward engineer and to reverse engineer a deployment diagram.
(b) What are the characteristics of a well-structured deployment diagram?
(c) What are the common uses of deployment diagram?
- 8 (a) Draw and explain sequence diagram for the search facility of the objects, so that "Wild Card" characters can be used when searching for titles, authors, or borrowers.
(b) Explain the searching for a book operation using a java program and give its equivalent class diagram.

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B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

OBJECT ORIENTED ANALYSIS & DESIGN

(Common to CSE, IT & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Explain about object oriented modeling in detail.
- 2 (a) Define responsibility. Explain responsibility with an example.
(b) Explain about the steps for modeling of vocabulary of a system with example.
- 3 Explain and draw the class diagram for student course registration.
- 4 Define interaction? Draw the graphical representation of messages, links and sequencing of interactions in detail.
- 5 Prepare an activity diagram that elaborates the details of logging into an email system. Explain the steps with a neat diagram.
- 6 Define an event and a signal. Explain briefly about the common modeling techniques of events and signals.
- 7 (a) Enumerate the steps to model executables and libraries.
(b) What are the characteristics of well-structured components? Explain.
- 8 Draw the complete use case diagram for the library system and explain the relationships and responsibilities of various actors.

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B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

OBJECT ORIENTED ANALYSIS & DESIGN

(Common to CSE, IT & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Explain how the UML addresses four aims of modeling.
- 2 Explain about the steps for modeling the architectural views.
- 3 Explain and draw the object diagram for student course registration.
- 4 Explain and draw the sequence diagram for treatment use case between patient and doctor.
- 5 Draw the usecase diagram and the activity diagram for an online airline reservation system. Summarize the purpose of each usecase, actor, and its importance. Briefly explain various activity states and action states in the activity diagram.
- 6 Explain the forward engineering tool and reverse engineering tool for a sample code with respect to the state chart diagram.
- 7 (a) Define component. What are the differences between components and classes? How are component and interface related?
(b) What are the properties of components?
(c) What are the standard stereotypes that apply to components?
- 8 (a) Draw a class diagram showing architectural overview of the library system.
(b) Explain "Issuing of a book" operation using collaboration diagram.

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OBJECT ORIENTED ANALYSIS & DESIGN

(Common to CSE, IT & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Explain in detail about UML language.
- 2 (a) Differentiate between collaboration diagram and state chart diagram of UML.
(b) Differentiate between sequence diagram and activity diagram in detail.
- 3 Explain about the steps involved in modeling simple collaborations with examples.
- 4 Explain in detail about the collaboration diagram with example.
- 5 Differentiate between forking and joining. What are the stereo types that can be applied to dependency relationships among use cases? Explain in detail the common uses and properties of activity diagram.
- 6 (a) What is a state? What are the several parts of states?
(b) What is a transition? Explain the several parts of transitions.
- 7 Explain the common modeling techniques of deployment.
- 8 What are the various object participating in the library information system? Explain the object diagram that is associated with various interactions with a neat diagram.

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B.Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

UNIX INTERNALS

(Computer Science and Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw and explain the architecture of Unix.
(b) What is mutual exclusion problem? Present the kernel solution the same.
- 2 (a) Discuss in detail about the structure of a buffer pool.
(b) Present a detailed note on buffer headers.
- 3 (a) Describe an algorithm that takes an in-core I-node as input and updates the corresponding disk I-node.
(b) Distinguish between read and direct and indirect blocks of an I-node.
- 4 (a) Explain the role of pipes in transfer of data between processes.
(b) Discuss in detail about the write system call.
- 5 (a) When attaching a region to a process, how can the kernel check that the region does not overlap virtual addresses in regions already attached to the process?
(b) Write and explain the steps for context switch.
- 6 (a) Explain the role of init in handling the system calls.
(b) Write and explain the algorithm for allocating the text regions.
- 7 (a) Implement a system call renice x y, where x is a process ID (of active process) and y is the value that its nice value should take.
(b) Explain the fair share scheduler with suitable example.
- 8 Write short notes on the following:
 - (a) Role of semaphores in inter process communication.
 - (b) Terminal polling.
 - (c) Clists.

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UNIX INTERNALS

(Computer Science and Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Discuss in detail about the multiple processes that are sleeping on a lock.
(b) With the help of neat sketch explain the architecture of Unix system.
- 2 (a) Distinguish between asynchronous and delayed write.
(b) Write the algorithms for the following:
 - (i) Writing to a disk.
 - (ii) Reading from a disk.
- 3 (a) How can we access the inodes? Explain in detail.
(b) Write and explain the algorithm to convert a path name to an inode.
- 4 (a) Discuss in detail about the mounting and un mounting of a file system.
(b) Write a short notes on dup system call.
- 5 (a) Design an algorithm that translates virtual addresses to physical addresses, given the virtual address and the address of the region entry.
(b) Give brief description about the interrupts and exceptions.
- 6 (a) Discuss in detail about the various anomalies that arise due to the signals.
(b) Give brief description about exit and wait system calls.
- 7 (a) What is the importance of nice system call in process scheduling? Explain in detail.
(b) Write a program to handle process lock.
- 8 (a) What is a stream? Explain how to push a module onto a stream.
(b) Explain the data structures for shared memory.

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UNIX INTERNALS

(Computer Science and Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw and explain the Unix directory structure.
(b) Explain the memory management by using the kernel.
- 2 (a) List the advantages and disadvantages of buffer cache.
(b) Write and explain the algorithm for block read ahead.
- 3 (a) Explain the race condition in assigning of inodes.
(b) Describe in detail about the allocation of disk blocks.
- 4 (a) Distinguish between file locking versus record locking.
(b) A process can open a file in write append mode, meaning that every write operations starts at the byte offset marking the current end of file. Therefore, two processes can open a file in write append mode and write the file without overwriting data. What happens if a process opens the files in write append mode seeks to the beginning of the file?
- 5 (a) Consider the algorithm for doing a context switch. Suppose the system contains only one process that is ready to run. In other words, the kernel picks the process that just saved its context to run. Describe what happens.
(b) Draw and explain the process state transition diagram.
- 6 What is a signal? Explain the role of signals in process communication. Explain in detail, how to handle the signals.
- 7 (a) What is profiling? Explain it with a suitable example.
(b) Write and explain the algorithm to swap the processes.
- 8 (a) List the different system calls involved in message passing. Explain them in detail.
(b) Write the pseudo code for multiplexing windows.

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B.Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

UNIX INTERNALS

(Computer Science and Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Distinguish between kernel stack and user stack of a process.
(b) Give brief description about the different data structures used by the kernel.
- 2 (a) Write and explain the algorithm for buffer allocation.
(b) What is a race condition? Explain it in detail.
- 3 (a) Draw and explain the structure of a regular file.
(b) Explain the block layout of a file and its inode.
- 4 (a) The standard I/O library makes user reading and writing more efficient by buffering the data in the library and thus potentially saving the number of system calls a user has to make. How would you implement the library functions f read and f write? What should the library f open and f close do?
(b) What is the use of unlink system call? Write and explain the algorithm for unlinking a file.
- 5 (a) What happens if the kernel issues a wakeup call for all processes asleep on address A, but no processes are asleep on that address at the time?
(b) Write a detailed note on allocation of a region to a process.
- 6 (a) Present an algorithm for fork system call and explain it in detail.
(b) Write a program to share file access by both child and parent.
- 7 (a) Explain the data structures used in demand paging.
(b) Give brief description about page stealer process.
- 8 (a) Explain various system calls used in socket programming.
(b) What is the role of semaphore in system calls? Explain in detail.

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OPTIMIZING TECHNIQUES

(Common to CSE & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 State whether each of the following functions is convex, concave, or neither:
- (i) $f(x) = e^x$.
- (ii) $f(x) = \frac{1}{x^2}$.
- 2 Minimize the function $f(x) = 0.65 - [0.75(1 + x^2)] - 0.65x \tan^{-1}\left(\frac{1}{x}\right)$ using the golden section method with $n=6$.
- 3 Solve the following LP problem using graphical method and give your comment on the result:
- Maximize $Z = 5X_1 + 4X_2$
Subject to $X_1 - 2X_2 \leq 1$
 $X_1 + 2X_2 \geq 3$
 $X_1, X_2 \geq 0$
- 4 Four new machines $M_1, M_2, M_3,$ and M_4 are to be installed in a machine shop. There are five vacant places A, B, C, D, and E available. Because of limited space, machine M_2 cannot be placed at C and M_3 cannot be placed at A. C_{ij} , the assignment cost of machine I to place j in rupees is shown below.
- | | A | B | C | D | E |
|-------|----|---|----|---|---|
| M_1 | 4 | 6 | 10 | 5 | 6 |
| M_2 | 7 | 4 | -- | 5 | 4 |
| M_3 | -- | 6 | 9 | 6 | 2 |
| M_4 | 9 | 3 | 7 | 2 | 3 |
- Find the optimum assignment schedule.
- 5 Explain the economic interpretation of Lagrangian multiplier method and derive the Kuhn-Tucker conditions for the non-linear programming problem.

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- 6 (a) Why is handling of equality constraints difficult in the penalty function methods?
(b) What is the difference between the interior and extended interior penalty function methods?

- 7 Solve the following problem using direct quadratic approximation method:

$$\text{Minimize } f(x) = 6x_1x_2^{-1} + x_2x_1^{-2}$$

$$\text{subject to } h(x) = x_1x_2 - 2 = 0$$

$$g(x) = x_1 + x_2 - 1 \geq 0.$$

From the initial feasible estimate $x^0 = (2, 1)$.

- 8 A ship is to be loaded with stock 3 items. Each unit of item has a weight w_i and value r_i . The maximum cargo weight the ship can carry is 5 and the details of the three items are as follows:

Item (i)	Weight (W_i)	Value (r_i)
1	1	15
2	3	40
3	2	60

Find the most valuable cargo load without exceeding the maximum cargo weight by using dynamic programming.

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OPTIMIZING TECHNIQUES

(Common to CSE & CSS)

Time: 3 hours

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Answer any FIVE questions
All questions carry equal marks

- 1 (a) Suppose a point satisfies sufficiency conditions for a local minimum. How do you establish that is a global minimum?
- (b) Are region elimination methods as a class more efficient than point estimation methods. Why or why not?
- 2 Find the minimum of $f = x(x-1.5)$ in the interval (0.0, 1.0) using interval halving method to within 10% of the exact value.
- 3 Solve the following LP problem using simplex method:
 Maximize $Z = 2 X_1 + 4 X_2 + 3 X_3$
 Subject to $3 X_1 + 4 X_2 + 2 X_3 \leq 60$
 $2 X_1 + X_2 + 2 X_3 \leq 40$
 $X_1 + 3 X_2 + 2 X_3 \leq 80$
 $X_1, X_2, X_3 \geq 0.$
- 4 An air line that operates seven days a week has time table shown below. Crews must have a minimum layover of 4 hours between flights. Obtain the pairing of flights that minimize layover time away from home. For any given pairing the crew will be based at the city that results in the smaller layover. For each pair also mention the town where the crew should be placed.

City A to City B			City B to City A		
Flight No.	Departure	Arrival	Flight No.	Departure	Arrival
1	7.00 Hrs	8.00 Hrs	1	8.00 Hrs	9.15 Hrs
2	8.00 Hrs	9.00 Hrs	2	8.30 Hrs	9.45 Hrs
3	13.30 Hrs	14.30 Hrs	3	12.00 Hrs	13.15 Hrs
4	18.30 Hrs	19.30 Hrs	4	17.30 Hrs	18.45 Hrs

- 5 Using the method of Lagrangian multipliers, solve the non-linear programming problem.
 Maximize $Z = 6x_1 + 8x_2 - x_1^2 - x_2^2$
 subject to the constraints $4x_1 + 3x_2 = 16$
 $3x_1 + 5x_2 = 15$

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- 6 (a) Explain Method Of Multipliers (MOM) characteristics.
 (b) Under what conditions does the MOM produce no distortion in the curvature of the penalty function contours from stage to stage.

- 7 Solve the following nonlinear programming problem.

$$\text{Minimize } Z = x_1^2 + x_2^2 + 5$$

$$\text{subject to } 3x_1^4 + x_2 \leq 16$$

$$x_1 + 2x_2^2 \leq 32$$

$$x_1, x_2 \geq 0.$$

- 8 A man is engaged in buying and selling identical items. He operates from a ware house that can hold 500 items. Each month he can sell any quantity that he chooses up to the stock at the beginning of the month. Each month he can buy as much as he wishes for delivery at the end of the month so as his stock does not exceed 500 items. For the next four months, he has the following error-free forecasts for cost sales prices.

Month	:	I	1	2	3	4
Cost	:	C_i	27	24	26	28
Sales price	:	P_i	28	25	25	27

If he currently has a stock of 200 units, what quantities should he sell and buy in next four months. Find the solution using dynamic programming.

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OPTIMIZING TECHNIQUES

(Common to CSE & CSS)

Time: 3 hours

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All questions carry equal marks

- 1 In terminating search methods, it is recommended that both the difference in variable values and the difference in the function values be tested. It is possible for one test alone to indicate convergence to a minimum while the point reached is really not a minimum. Illustrate graphically.
- 2 Prove that $f(x) = 2x_1^2 + 2x_2^2 + 4x_3^2 + 2x_1x_2 + 2x_1x_3 + 4x_2x_3$ is a convex.
- 3 A small manufacturer employs 5 skilled men and 10 semi-skilled men and makes an article in two qualities, a deluxe model and an ordinary model. The making of a deluxe model requires 2 hours work by a skilled man and 2 hours work by a semi-skilled man. The ordinary model requires 1 hour work by a skilled man and 3 hours work by a semi-skilled man. By union rules no man can work more than 8 hours per day. The manufacturer's clear profit of the deluxe model is Rs.10 and of the ordinary model is Rs. 8. Formulate the model of the problem as LPP.
- 4 (a) Distinguish between transportation problem and assignment problem.
(b) Explain the Hungarian method for solving an assignment problem.
- 5 (a) What is the significance of Lagrange multipliers?
(b) Find the maxima and minima, if any, of the function:
 $f(x) = 4x^3 - 18x^2 + 27x - 7$.
- 6 (a) Why should equality constraints be eliminated before applying direct search optimization methods?
(b) Why is convexity necessary to guarantee the successful operation of the complex method?
- 7 Solve the following mixed-integer program by the branch and bound algorithm:
Minimize $Z = 10x_1 + 9x_2$
subject to $x_1 \leq 8, x_2 \leq 10,$
 $5x_1 + 3x_2 \geq 45$
 $x_1 \geq 0, x_2 \geq 0.$
 x_2 is an integer.

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- 8 A project is compared of eleven activities, the time estimate for which are given below:

activity	t_0	t_p	t_m (days)
1 - 2	7	17	9
1 - 3	10	60	20
1 - 4	5	15	10
2 - 5	50	110	65
2 - 6	30	50	40
3 - 6	50	90	55
3 - 7	1	9	5
4 - 7	40	68	48
5 - 8	5	15	10
6 - 8	20	52	27
7 - 8	30	50	40

- (a) Draw the network diagram for the project.
(b) Determine the critical path.
(c) What is the probability of finishing the project in 125 days?

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OPTIMIZING TECHNIQUES

(Common to CSE & CSS)

Time: 3 hours

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Answer any FIVE questions
All questions carry equal marks

- 1 An experimenter has obtained the following equation to describe the trajectory of a space capsule: $f(x) = 4x^3 + 2x - 3x^2 + e^{x/2}$. Determine a root of the above equation.
- 2 Find the relative extreme of $(x_1^2 - 2x_1 + 4x_2^2 - 8x_2)^2$.
- 3 (a) What is the difference between slack, surplus, and artificial variables? How do they differ in their structure and use?
(b) What is the difference between a feasible solution, a basic feasible solution, and an optimal solution of a linear programming problem?
- 4 Determine the optimal solution for the following transportation problem.

		To			Supply
		3	8	5	5
From		5	5	3	8
		7	6	9	7
		4	9	5	14
		Demand	7	9	18

- 5 (a) State the Kuhn–Tucker conditions.
(b) The profit per acre of a farm is given by: $20x_1 + 26x_2 + 4x_1x_2 - 4x_1^2 - 3x_2^2$. Where x_1 and x_2 denote, respectively, the labour cost and the fertilizer cost. Find the values of x_1 and x_2 to maximize the profit.
- 6 What is penalty function concept? Explain interior penalty function algorithm.
- 7 Consider the nonlinear programming problem
Minimize $f(x) = x_1^{-1} + x_2^{-1}$
subject to $h(x) = \frac{1}{2}x_1^2 + x_2^2 - 1 = 0$
 $x_1, x_2 \geq 0$.
Construct a full quadratic approximation to the problem at the point $x^0 = (\frac{3}{4}, \frac{3}{4})$.
- 8 State the Bellman's principle of optimality and explain by an illustrative example how it can be used to solve multi-stage decision problems.

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B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

DISTRIBUTED SYSTEMS
(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Explain in detail different examples of a distributed system.
- 2 Explain the interfaces in a distributed system.
- 3 How the addresses of resources or objects when given names are obtained? Explain.
- 4 (a) Explain the implementation of FIFO ordering
(b) Explain the implementation of total ordering.
- 5 Explain the problems of concurrency transactions using any real time example.
- 6 Discuss different conditions and suitable solutions for sub transactions in nested transactions.
- 7 How to secure electronic transactions using secure sockets? Explain any suitable protocol.
- 8 (a) Define DSM. List out supporting goals. Suggest a few real time examples.
(b) Compare message passing and distributed shared memory?

Code: 9A05604

B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

DISTRIBUTED SYSTEMS

(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What are the resources that can be shared in a distributed system?
(b) How the failure of computer systems in a distributed system affects its performance?
- 2 (a) What is Garbage collection? How it is achieved in a distributed system?
(b) Explain the RMI invocation semantics.
- 3 (a) What is the need for peer to peer services?
(b) What are the functional and non functional requirements of peer to peer systems?
- 4 (a) What are overlapping groups?
(b) What are the problems of agreement?
- 5 (a) Describe failure model for transactions.
(b) Explain the life history for transactions with example.
- 6 (a) Describe the procedure for creating virtual partitions with example.
(b) Briefly explain virtual partition algorithm with example.
- 7 Compare and contrast between symmetric and asymmetric algorithms with suitable example.
- 8 Discuss briefly various implementation approaches for DSM with example.

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B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

DISTRIBUTED SYSTEMS

(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 How multimedia services are made available in a distributed system? What are the technical challenges and how they are overcome?
- 2 Explain in detail the distributed object model.
- 3 Explain the algorithmic and architectural models behind current peer to peer systems.
- 4 Explain the network time protocol.
- 5 Explain serial equivalence and conflict operations of transactions with example.
- 6 (a) Sketch and explain the basic architectural model for replicated data.
(b) Why you need group communication? Explain the role of group membership services.
- 7 (a) Discuss the confusion and diffusion in the design of cryptographic algorithms. What are the advantages of handwritten signatures?
(b) What is authentication? Suggest supporting scenarios.
- 8 What are the design and implementation issues of DSM? Explain with example.

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B. Tech III Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013

DISTRIBUTED SYSTEMS

(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Why the World Wide Web is called a distributed system?
- 2 (a) What are the interfaces used in original client/server model related to RPC?
(b) What is an interface definition language?
- 3 (a) Explain the storage organization of ocean store objects.
(b) What are the types of identification used in ocean store?
- 4 Explain Cristian's method for synchronization of clock.
- 5 Why you need atomic transactions? Discuss the role of recoverable objects. List out and explain supporting transaction capabilities with example.
- 6 Briefly discuss view-delivery and view-synchronous group communication with example.
- 7 What are the goals of security? List out and explain the design issues for secure systems.
- 8 (a) What is the format of IOR? List out and explain CORBA services.
(b) Briefly discuss the list of bind operations in CORBA naming service.

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III B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2013

ARTIFICIAL INTELLIGENCE
(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 What is an AI technique? Discuss the problem of an AI technique with help of examples.
- 2 (a) Define the terms: State space, Search tree, Search node, Branching factor.
(b) Explain why problem formulation must follow goal formulation.
- 3 (a) Explain Davis- Putnam algorithm for backtracking.
(b) Discuss completeness of resolution in detail.
- 4 Briefly illustrate the use of first order logic for simple representations.
- 5 Explain the solution for inferential frame problem.
- 6 Explain maximal probability using examples.
- 7 (a) Explain with examples how the background knowledge is useful for faster learning than from a pure inductive program.
(b) Explain knowledge base inductive learning.
- 8 Explain sectional view of a fuzzy room cooler

Code: 9A05605

III B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2013

ARTIFICIAL INTELLIGENCE

(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What kinds of techniques will be useful for solving AI problems? Explain.
(b) Discuss the task domains of AI.
- 2 Explain in detail bidirectional search strategy. Compare it with other uninformed search strategy.
- 3 (a) Discuss the following heuristics – pure symbol heuristic, unit clause heuristic.
(b) Make a comparison between data-driven reasoning and goal directed reasoning.
- 4 (a) Explain universal instantiation and existential instantiation with illustrations.
(b) Discuss the unification algorithm.
- 5 (a) What are the different relations involved in the event calculus?
(b) Explain in brief about the generalized events.
- 6 Explain probability density function with examples.
- 7 (a) We never test the same attribute twice along one path in a decision tree. Why not?
(b) Write short notes on inductive learning.
- 8 (a) Explain crisp sets with examples.
(b) Explain sugeno style of fuzzy inference processing.

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ARTIFICIAL INTELLIGENCE
(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What properties an AI technique ought to process? Explain.
(b) Discuss production system characteristics.
- 2 Prove that uniform-cost search and breadth first search with constant step costs are optimal when used with the GRAPH_SEARCH algorithm.
- 3 Describe efficient algorithms for propositional inference based on model checking.
- 4 (a) Discuss the inference rules for quantifiers.
(b) Explain the models of first order logic.
- 5 What is description logic? Explain the language of "CLASSIC".
- 6 (a) Explain about degree of belief and probability theory.
(b) Explain the concept of independence and show that the three forms of independence are equivalent.
- 7 (a) Explain the terms pruning and cross-validation.
(b) Explain ensemble learning.
- 8 (a) Name different fuzzy set operations. Explain them.
(b) Explain sectional view of a fuzzy room cooler.

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ARTIFICIAL INTELLIGENCE
(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is a heuristic? Discuss heuristic search.
(b) Discuss some of the problem contained within AI.
- 2 Explain depth first search strategy. List the limitations of it. Discuss how depth-limited search overcomes any of these limitations.
- 3 (a) Define unit clause, horn clause.
(b) Discuss the standard logical equivalences.
- 4 (a) Discuss composition of substitutions with lucid examples.
(b) What is a choice point? How to implement them? Explain.
- 5 What do you mean by stable model semantics? Explain in brief.
- 6 (a) Explain the nature of uncertain knowledge with examples.
(b) Prove that the disjunction of all possible atomic events is logically equivalent to true use proof by induction on the number of random variables.
- 7 Explain the following:
(a) Supervised learning.
(b) Unsupervised learning.
(c) Reinforcement learning.
- 8 Explain fuzzification and defuzzification of fuzzy logic based system.
