

Code: 9A04602

III B. Tech II Semester (R09) Supplementary Examinations, November/December 2012

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) Differentiate between overlapping and non-overlapping segmentation in 8086 microprocessor.
(b) Explain the special functions of general purpose registers.
- 2 (a) Write an ALP in 8086 to add five 16-bit numbers and result is 24 bit.
(b) Write an ALP in 8086 to add two 16 bit decimal numbers.
- 3 (a) Briefly explain the maximum mode configuration of 8086.
(b) What is the purpose of MN/MX pin? Explain.
- 4 (a) Explain about internal registers of 8259.
(b) With neat block diagram explain briefly about PPI.
- 5 (a) Explain control word format of 8251.
(b) Define frame in asynchronous communication and draw it.
- 6 (a) Discuss about the programming model of 8259.
(b) It is necessary to serve 18 interrupt requests using 8259's. The address map for the 8259's is given from 0A00H to 0A0FH. Show the complete interface with 8086 system bus. These 18 interrupts are to be requested from interrupt type 040 H on words, with edge triggered mode and auto end of interrupt. Give the initialization sequence for all 8259's.
- 7 (a) Explain in brief about programming 8051 timers.
(b) What are the steps involved in programming the 8051 to transfer data serially?
- 8 (a) Explain the instruction set of MCS-96 microcontrollers with simple example.
(b) List the applications of ARM cores.

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B. Tech III Year II Semester (R09) Supplementary Examinations, November/December 2012

OBJECT ORIENTED ANALYSIS & DESIGN

(Common to CSS, IT & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Define modeling. Explain about the importance of modeling in detail.
- 2 Define class, object, attribute and operations. Explain with example the organization of attributes and operations using stereo types.
- 3 Explain about the steps involved in modeling to forward engineer a class diagram with examples.
- 4 Explain about flat and procedural sequencing with a diagram.
- 5 (a) What are the contents, common properties and common uses of use case diagrams?
(b) Enumerate the steps to model the context of a system.
- 6 (a) List and explain various kinds of events in UML.
(b) Enumerate the steps to model the kinds of exceptions that an object may throw through its operations.
- 7 (a) Enumerate the steps to reverse engineer a deployment diagram.
(b) Enumerate the steps to model a physical database schema.
(c) Explain the properties of a component diagram.
- 8 Explain how the extend and include stereotypes of the dependency relation are used with use case diagram for the library system. Give the sequence of steps for drawing the use case diagram.

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UNIX INTERNALS

(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is kernel? How kernel will interact the system underlying hardware?
(b) Explain how kernel data structures are used to provide systems administration.
- 2 (a) What is the need to buffer cache and draw the structure of the buffer pool?
(b) Write the logic for sending the data to and reading data from buffer cache with an example.
- 3 (a) Draw a disk diagram blocks wise and explain functionalities each block.
(b) Write a C program to determine the file type and permissions for a user given file.
- 4 (a) List various system calls for the file system along with syntax.
(b) Write a C program to check for the file permission and change its owner name to "New user" if file takes "Execute" permission.
- 5 (a) Draw a neat diagram for Unix process state diagram and explain state transitions using its context switching.
(b) Explain content of process address space and its working.
- 6 (a) What is 'Exec' system call? List all possible ways of calling 'Exec' system calls with each examples.
(b) Discuss the login process invocation beginning from init process.
- 7 (a) How do you control scheduling mechanisms with the help of process scheduling system calls?
(b) Explain how demand paging mechanism works in a given content.
- 8 Write short notes on the following:
(a) IPC mechanisms.
(b) Streams and stream handling.
(c) Network communications.

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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 Explain clearly the structure of optimization problems.
- 2 Minimize $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ from the starting point $X_1 = \begin{Bmatrix} 0 \\ 0 \end{Bmatrix}$ using Marquardt method with $\alpha_1 = 10^4, c_1 = \frac{1}{4}, c_2 = 2, \text{ and } \varepsilon = 10^{-2}$ (Two iterations).
- 3 Solve the following LP problem using graphical method:
 Maximize $Z = 6X_1 + 9X_2$
 Subject to $X_1 + X_2 \leq 12$
 $X_1 + 5X_2 \leq 45$
 $3X_1 + X_2 \leq 30$
 $X_1, X_2 \geq 0$
- 4 Define trans-shipment problem. Explain the differences between a transportation problem and trans-shipment problem.
- 5 State and prove Kuhn-Tucker necessary and sufficient conditions in non-linear programming.
- 6 Estimate upper and lower bounds on the variables and obtain a starting feasible solution for the following problem.
 Minimize $f(x) = 3x_1^2 - 2x_2$
 subject to $g_1(x) = 2x_1 + x_2 \geq 4$
 $g_2(x) = x_1^2 + x_2^2 \leq 40$
- 7 (a) What are the drawbacks of using pre-emptive weights in goal programming?
 (b) Describe the "Portioning" concept and "Variable Elimination" rule in the linear goal programming algorithm. How do they help in improving the efficiency of the algorithm?
- 8 What is meant by dynamic programming? Give an illustrative example. What kind of problem can be solved by this method?

DISTRIBUTED SYSTEMS
(Computer Science & Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is the main motivation for constructing a distributed system?
(b) What are the challenges arising from the construction of a distributed system?
- 2 How distributed objects communicate using RMI?
- 3 What are the basic design issues for name services?
- 4 (a) What are clock skew and clock drift?
(b) What is coordinated universal time? How it is implemented?
- 5 Briefly explain concurrency control protocols with example.
- 6 Available copies replication is applied to data items A and B with replicas A_x , A_y and B_m , B_n . The transactions T and U are defined as:
T: read (A); Write (B, 44),
U: read (B); Write (A, 55),
Show an interleaving of T and U assuming that two phase locks are applied to the replicas. Explain why locks alone cannot ensure one copy serializability if one of the replicas fails during the process of T and U. Explain with reference to this example how local validation ensures one copy serializability.
- 7 Discuss the procedure for TEA encryption and decryption functions.
- 8 Compare and contrast between release and sequential consistency models with example.

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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 AI? What are the underlying assumptions about intelligence?
(b) Discuss the issues in the design of search program.
- 2 What is meant by search strategy? Discuss any two search strategies that come under the heading of uniformed search.
- 3 (a) Explain the functionality of a knowledge based agent.
(b) Give a BNF grammar of sentences in propositional logic.
- 4 (a) Discuss representational languages in general.
(b) Give the models for first order logic.
- 5 Explain about the system designed for organizing and reasoning with categories.
- 6 (a) Explain about uncertainty.
(b) Prove that any proposition is logically equivalent to the disjunction of the atomic events that entitles its truth.
- 7 (a) Explain the different forms of learning.
(b) Explain inductive learning.
- 8 Name different fuzzy set operations. Explain them.
