

Code: 9A04602

III B. Tech I Semester (R09) Regular Examinations, November 2011
MICROPROCESSORS & MICROCONTROLLERS

(Common to Computer Science & Systems Engineering, Information Technology & Electronics &
Computer Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Discuss the features of 8086 flags.
(b) Write an ALP to add two given 4 digit BCD numbers.
- 2 (a) How do you pass parameters to a 'Macro'?
(b) Discuss the basic steps involved in an A/D converter.
- 3 (a) Explain the method of interfacing with 8257.
(b) Interface two 4K*8 EPROMS and two 4K*8 RAM chips with 8086 select suitable memory map.
- 4 (a) Explain 8259 PIC architecture.
(b) With an example discuss the interrupt structure of 8086.
- 5 (a) Distinguish between synchronous and Asynchronous data format.
(b) Discuss the features of TTL to RS232C.
- 6 (a) Write 8051 program to initialize timer 1 in mode 1.
(b) Write an 8051 program to generate a triangular wave.
- 7 (a) Explain the modes of 8253.
(b) What is the purpose of operational command of 8259? Explain their command and the use.
- 8 (a) Explain the addressing modes of MCS-96 microcontrollers.
(b) How do you interface the DAC to the microcontroller? Explain.

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- 1 (a) Describe different segment register of 8086 microprocessor.
(b) What is modular programming? Explain.
- 2 (a) Draw the timing diagrams of Read cycle of 8086 in any one mode.
(b) Explain branch and call instructions with examples.
- 3 (a) Write a program to find out even and odd numbers from given series of 16 bit Hexadecimal numbers.
(b) Explain 8086-minimum mode and maximum mode of operation.
- 4 (a) List the major components of 8259 A interrupt controller and explain their functions.
(b) How is interfacing keyboard and display controller is performed? Explain.
- 5 (a) Explain about USART and how is it interfaced to the processor.
(b) Describe briefly about high-speed serial communications standard.
- 6 (a) Draw and discuss the formats and bit definitions of the SFRS in 8051 microcontroller PCON & PSW.
(b) Discuss the modes of 8253.
- 7 (a) Discuss the internal and external memories of 8051.
(b) Discuss the salient features of 8259.
- 8 (a) Explain memory map of MCS-96 microcontroller.
(b) List the important features of ARM.

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- 1 (a) With neat figure explain architecture of 8086 microprocessor.
(b) Write an ALP to subtract two 16 bit numbers.
- 2 (a) Explain 'Linker'.
(b) With neat timing diagram explain the 'write cycle operation'.
- 3 (a) Explain the features of RAM and EPROM.
(b) How is interfacing done with 8237/8257?
- 4 (a) Explain DOS and BIOS interrupts.
(b) Discuss D/A and A/P converter interfacing.
- 5 (a) Discuss how interfacing is done using USART.
(b) Explain the features of RS232C.
- 6 (a) Explain command words of 8253.
(b) Write an ALP to read 2KB of data from location 0000H: 2000H in the system memory to a peripheral on channel of the DMA controller. Disable all other channel program TC stop, no auto load is required fixed priority.
- 7 (a) Explain serial communication interrupt of 8051.
(b) Interface the 7-segment display in time-multiplexing and display select method and explain the same.
- 8 (a) Explain ARM core architecture.
(b) Discuss the bit format of IP register of 8051.

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- 1 (a) Discuss the general functions of all general purpose registers of 8086.
(b) Discuss the function of flag register.
- 2 (a) Write an ALP to find the largest among a given array of 16 bit numbers. (Choose a length of the array as 100).
(b) Explain sorting with an example.
- 3 (a) Discuss the need for DMA.
(b) Draw and explain the timing diagram of JMP addr.
- 4 (a) Discuss the various modes of operation of 8255.
(b) Explain interrupt service routines.
- 5 Explain the USART architecture and interfacing.
- 6 (a) What is the purpose of operational command words of 8259? Explain the format and uses.
(b) Write 8051 program to receive a serial byte through RxD.
- 7 (a) Discuss the addressing modes of 8051.
(b) Discuss the following signals of 8051. ALE, \overline{RD} , \overline{EA} , TxD and RxD.
- 8 (a) Discuss the ARM core architecture.
(b) Give the differences between Microprocessors and Microcontrollers.

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III B.Tech I Semester (R09) Regular Examinations, November 2011

SOFTWARE ENGINEERING

(Common to Computer Science & Systems Engineering, Information Technology & computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 What are the characteristics of software engineering? Discuss role of software in current world.
- 2 What are the different types of prescriptive process models? Explain the evolutionary process model?
- 3 (a) How to make stakeholders to understand the requirements model?
(b) What are the elements of requirements model?
- 4 What is software architecture? Explain different types of architectural styles?
- 5 Explain how to design class-based components. Explain its basic design principle.
- 6 (a) Differentiate between verification and validation.
(b) Discuss briefly about orthogonal array testing.
- 7 (a) What is risk identification? Explain in detail.
(b) What is risk protection? Explain in detail.
- 8 Define SQA. Explain SQA tasks, goal and metrics.

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Answer any FIVE questions
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- 1 What is software process assessment and improvement? Explain different approaches proposed for the past few decades.
- 2 (a) What is risk analysis? Explain the spiral model.
(b) How spiral model differ from other models.
- 3 What are the different types of data modeling concepts? Explain each in detail.
- 4 (a) Define abstraction. Explain different levels of abstraction.
(b) Explain the data abstraction and procedural abstraction with help of example.
- 5 Discuss how to design traditional components. Explain graphical design notation and tabular design notation.
- 6 Explain the following:
 - a) Smoke testing.
 - b) Regression testing.
 - c) Alpha and Beta testing.
 - d) Stress testing.
- 7 (a) What is risk refinement?
(b) Explain in detail about RMMM plan.
- 8 What is quality? Explain Garvin's Quality dimensions.

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- 1 What is CMMI? Explain the different CMM levels in detail.
- 2 What are the software requirements? Explain the functional and non-functional requirements. User requirements and system requirements.
- 3 (a) What are the various goals in requirement analysis and communication techniques?
(b) What are the different approaches have been proposed in requirement elicitation?
- 4 Discuss briefly about software quality guidelines and its attributes.
- 5 Explain interface design principles and guidelines.
- 6 What is software measurement? Explain in detail about LOC and FP metrics.
- 7 (a) What are the metrics of software?
(b) What is RMMM? Explain the RMMM plan.
- 8 How to calculate user satisfaction? Explain MC call's quality factors.

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Answer any FIVE questions
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- 1 What are the principles proposed by David Hooker? How that principles focus on software engineering practice?
- 2 (a) Define a software process framework activity with a neat diagram.
(b) Explain the iterative process flow and parallel process flow.
- 3 What are the different approaches have been proposed in requirement elicitation?
- 4 Discuss briefly how to translate requirements model in design model. Explain with neat diagram.
- 5 What are the golden rules of user interface design? Explain each one in detail.
- 6 Define quality? Explain the different types of testing in detail.
- 7 What is statical testing? Explain the different measures of software quality?
- 8 What is review? Explain the defect amplification and removal review.

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III B. Tech I Semester (R09) Regular Examinations, November 2011

OPERATING SYSTEMS

(Common to Information Technology, Electronics & Computer Engineering & Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Give a brief note on the operating system structure.
(b) Explain operating-system generation.
- 2 (a) What is the purpose of PCB? Explain various pieces of information contained in PCB.
(b) What is meant by 'convoy effect' in the context of FCFS scheduling algorithm? Explain with an example.
- 3 (a) Solve dining-philosophers problem using monitors.
(b) Give the definition of Swap () instruction.
- 4 (a) Explain the concept of swapping.
(b) Discuss LRU Page replacement algorithm.
- 5 Consider the deadlock situation that could occur in the dining philosopher's problem when the philosophers obtain the chopsticks one at a time. Discuss the four conditions for deadlocks indeed hold in the setting. Discuss how deadlocks could be avoided by eliminating any one of the four conditions.
- 6 Explain different allocation methods for disk space.
- 7 (a) Where should be the I/O functionality implemented in the device hardware, in the device driver or in the application software? Explain.
(b) Explain the following terms with respect to disk:
(i) Seek time (ii) Rotational latency (iii) Bandwidth
- 8 Compare symmetric and asymmetric encryption algorithms

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- 1 Explain in detail various hardware-based solutions to the critical-section problem.
- 2 (a) Define the following:
 - (i) Job pool.
 - (ii) Job scheduling.
 - (iii) CPU scheduling.(b) List five services provided by an operating system that are designed to make it more convenient for users to use the computer system. In what cases it would be impossible for user-level programs to provide these services. Explain.
- 3 (a) Explain the concept of process scheduling with the aid of a queueing diagram.
(b) What are the circumstances under which the CPU-scheduling decisions take place?
- 4 (a) What is meant by relocation? Give the necessary hardware for implementing dynamic relocation and explain.
(b) Explain FIFO page replacement algorithm with an example.
- 5 Explain Banker's algorithm for deadlock avoidance with an example.
- 6 How file systems are implemented in Linux and windows?
- 7 Discuss in detail the services provided by the kernel related to I/O.
- 8 Explain program related threats.

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- 1 (a) Discuss in detail distributed systems.
(b) Explain the system calls used in file management.
- 2 What are the benefits and disadvantages of the each of the following? Consider both the system level and the programmer level:
(a) Synchronous and asynchronous communication.
(b) Automatic and explicit buffering.
(c) Send by copy and send by reference.
(d) Fixed-sized and variable-sized messages.
- 3 (a) What is a semaphore? Explain the usage and implementation of semaphores.
(b) What are the drawbacks of log-based recovery?
- 4 (a) Why are segmentation and paging sometimes combined into one scheme?
(b) Discuss situations under which the most frequently used page replacement algorithm generates fewer page faults than the least recently used page replacement algorithm. Also discuss under what circumstance the opposite holds.
- 5 Discuss the methods for handling deadlocks.
- 6 What are the structures and operations that are used to implement file system operations?
- 7 Give a detailed note on RAID levels.
- 8 How access matrix can be used for providing protection?

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- 1 Discuss in detail the functions provided by the operating system.
- 2 (a) Describe the actions taken by a thread library to context switch between user-level threads.
(b) What are independent processes and cooperating processes? What are the reasons for process cooperation?
- 3 (a) What is meant by busy waiting? Modify the semaphore operations to overcome the need for busy waiting.
(b) Show that the timestamp-based protocol ensures conflict serializability.
- 4 (a) Why is it that the size of the page is typically a power of 2?
(b) Explain the different hardware implementations of page table.
- 5 Explain with an example Banker's algorithm for deadlock avoidance.
- 6 What is mounting of a file system, how mounting takes place in different operating systems? Explain with examples.
- 7 (a) With a neat diagram explain interrupt driven I/O in detail.
(b) Explain the following terms with respect to a magnetic disk.
 - (i) Transfer rate.
 - (ii) Random access time.
 - (iii) Head crash.
- 8 Explain how Operating System provides security.

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III B. Tech I Semester (R09) Regular Examinations, November 2011
COMPUTER NETWORKS

(Common to Information Technology & Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What factors should be considered while designing the transmission media?
(b) List the differences between connection less communication and connection oriented communication.
- 2 (a) Explain sequence numbering of frames in sliding window flow control mechanism.
(b) A channel has a bit rate of 4Kbps and propagation delay of 20m sec. For what range of frame size does stop & wait gives an efficiency of atleast 50percent.
- 3 (a) Explain the token ring operation.
(b) State the advantages & disadvantages of FDDI.
- 4 (a) Why under computer user dynamic solution? Explain with example how distance vector routing is used to route the packet and why count to infinity problem arises & how does it get solved.
(b) Under what conditions adaptive routing is preferred.
- 5 (a) Explain about concatenated virtual links.
(b) What is meant by tubbeling explain.
- 6 (a) Explain connection management issues in transport lays.
(b) Write short notes on:
(i) RPC.
(ii) Crash recovery
- 7 (a) What is scheduling? Discuss various techniques of queuing method.
(b) Explain band width scaling in RTCP.
- 8 (a) What are the security issues in common networks? Discuss the public key algorithm.
(b) Explain in brief substitution ciphers & transposition cipher.

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COMPUTER NETWORKS

(Common to Information Technology & Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What are the reasons for using layered protocols in communication networks?
(b) Explain the characteristics of transmission line.
- 2 (a) What are the various ARC retransmission strategies?
(b) What is protocol performance? Derive the relation for protocol performance for sliding window protocol mechanism.
- 3 (a) Compare 802.5 & FDDI.
(b) Explain CSMA/CD operation.
- 4 (a) What are the functions of network layer?
(b) Why leaky bucket algorithm should allowedly 1packet for tick independent of how large the packet is?
- 5 (a) Explain inter network routine.
(b) How networks can be consulted? Explain
- 6 (a) Explain connection management issues at transport layer.
(b) Explain how TCP connections are established using the three way handshakes.
- 7 (a) What is DNS? What resource records are associated with it?
(b) What are the security issues in communication network? Discuss the public key algorithm.
- 8 Write short notes on any two of the following:
(i) Digital signature.
(ii) Cryptography.
(iii) Public key algorithm.

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Answer any FIVE questions
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- 1 (a) What are service primitives? Explain with example.
(b) Explain the following media:
(i) STP (ii) UTP (iii) Co axial.
- 2 (a) Why framing of the bit stream is necessary? Explain different framing techniques with examples.
(b) Give the frame format of HDLC data link protocol.
- 3 (a) Explain the frame format of
(i) IEEE802.3 (ii) FDDL
(b) What is bridge & explain its architecture?
- 4 (a) Compare virtual circuit and datagram.
(b) List & explain the primary function of address resolution protocol.
- 5 (a) Explain the different types of IPV6 header format.
(b) Explain the features of network layers in the Internet.
- 6 (a) What is socket? Explain the steps followed in socket programming.
(b) Give an example of transport layer in public network & strategy used in the transport layer for getting recovery from IMP & host crashes.
- 7 (a) With the help of suitable diagram show the components of SNMP management model. Discuss the function of each block.
(b) Write short notes on:
(i) TELNET (ii) DNS.
- 8 (a) What is cryptography? Explain in brief substitute on cipher & transposition explains.
(b) What is policing? Give criteria for policing.

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Answer any FIVE questions
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- 1 (a) Suggest various network topologies for:
(i) Broad cast network (ii) Point to point network. List their advantages & disadvantages.
(b) What are the different transmission medium used in communication? Explain any two.
- 2 (a) Explain the two basic approaches. Go-Back-send selective repeat.
(b) A 100-Km long cable runs at T1 data rate. The propagation speed in the cable is 2/3 the speed of digit. How many bits fit in the cable?
- 3 (a) Draw & explain LLC frame format.
(b) What is MAC sublayer? State its position in layered architecture.
- 4 (a) What is fragmentation? Explain how it is supported in IP_{v4} & IP_{v6}.
(b) What is shortest path algorithm? Explain different shortest path algorithm.
- 5 (a) Explain any two Internet control protocols.
(b) Given an IP address, how will you extract its netid & hostid?
- 6 (a) Define a term silly window syndrome & possible solution to overcome its effects.
(b) What is TCP & UDP? Explain how you will choose between TCP & UDP. Compare them.
- 7 (a) Why network security is is needed? Explain RSA algorithm.
(b) Explain FTP.
- 8 Write short notes on any two of the following:
(i) Symmetric key algorithm.
(ii) Digital signature.
(iii) Network security issue.

III B. Tech I Semester (R09) Regular Examinations, November 2011

AUTOMATA & COMPILER DESIGN

(Common to Computer Science & Systems Engineering & Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain Chomsky hierarchy of Languages.
(b) Explain Briefly NP-Hard and NP-Complete Problems?
- 2 (a) What is flow-graph? Explain how given program can be converted into flow-graph?
(b) Explain the loop optimization?
- 3 (a) Distinguish between top down parsing and bottom up parsing. Give one example for each.
(b) Discuss about the method of resolving ambiguities in YACC with an example.
- 4 (a) Write a Syntax directed definition for adding type of the variables declared by the following grammar into the symbol table entries.

$$D \rightarrow T L \quad T \rightarrow \mathbf{int} / \mathbf{real}$$

$$L \rightarrow L, \mathbf{id} \quad L \rightarrow \mathbf{id}$$
 Draw the annotated parse tree for the declaration $\mathbf{int id}_1, \mathbf{id}_2$.
(b) Compare and contrast between quadruples and triples
- 5 Write and explain about object code forms?
- 6 (a) Define a Context Free Grammar. Find CFG generating the following languages.
(i) Language of arithmetic expressions over integer values with +, -, * and / operations.
(ii) Language of string over {0, 1} where the string has unequal number of 0's and 1's.
(b) Eliminate left recursion from the following grammar.

$$(i) E \rightarrow E+T / T \quad T \rightarrow T * F / F \quad F \rightarrow (E) / a$$

$$(ii) S \rightarrow SaA / a \quad A \rightarrow Aab / ab / B \quad B \rightarrow Ba / Bb / a$$
- 7 (a) Define the terms alphabet, strings and languages. Discuss about operations that can be performed on strings and languages with suitable examples.
(b) Define a DFA. Design a DFA (specify the transition graph and table) for recognizing the floating point constants in C. (Assume no limit on the number of digits in the constant).
- 8 Explain Hash table Organization of Symbol tables for block structure Languages.

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- 1 Consider the following code fragment.
 $A[i, j] = B[i, j] + C[A[k, 1]] + D[i+j]$
 Translate into
 a) Three address code b) Quadruples c) Triples
- 2 (a) Explain how input buffering can be used for token recognition? Write the use of sentinels in the process.
 (b) Define DFA. Draw DFA for recognizing the language of all strings over the alphabet {a, b} that contain even number of a's and odd number of b's. Process the input string ababb using the DFA.
- 3 (a) What is meant by Structural Equivalence of type Expression? Write a function, which will test the structural equivalence of two type expressions?
 (b) Discuss briefly about type conversions. What is Coercion?
- 4 (a) What is activation record and activation tree? How these are related with runtime storage organization?
 (b) Distinguish stack allocation and heap allocation strategies.
- 5 (a) Find First and Follow sets of the variables in the following grammar.
 $S \rightarrow AB$ $A \rightarrow aAa / bAb / a / b$ $B \rightarrow aB / bB / b$
 (b) Show that the following grammar is ambiguous. Find equivalent unambiguous grammar.
 $S \rightarrow A / B$ $A \rightarrow aAb / ab$ $B \rightarrow abB / \epsilon$
- 6 Write and Explain about Peephole optimization
- 7 Construct DAG for the following basic block
 $d := b+c$
 $e := a+b$
 $b := b*c$
 $a := e-d$
- 8 (a) Construct set of LR (1) items for the following grammar.
 $S \rightarrow CC$ $C \rightarrow aC / d$
 (b) Discuss about the conflicts that can arise in a shift reduce parser.

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- 1 Construct SLR parsing table for the following grammar.
 $E \rightarrow E \text{ sub } E \text{ sup } E / E \text{ sub } E / E \text{ sup } E / \{E\} / c$
 Resolve the ambiguities by assuming the operators sub and sup with same precedence and right associative. Consider the production $E \rightarrow E \text{ sub } E \text{ sup } E$ as special production and give higher precedence in case of conflicts.
- 2 What are legal evolution orders and names for the values at the nodes for the DAG for following:

$$\begin{aligned} d &:= b + c \\ e &:= a + b \\ b &:= b * c \\ a &:= e - d \end{aligned}$$
- 3 Discuss in detail about the use of Regular Expressions and Finite Automata for the lexical analysis phase?
- 4 Construct predictive parser table for the following grammar.
 $E \rightarrow TA \quad A \rightarrow +TA / a \quad T \rightarrow FB \quad B \rightarrow *FB / a$
 $F \rightarrow (E) / \text{id}$
 Show the parser moves for $a+a*a$.
- 5 (a) With an example, explain the process of bottom up evaluation of S-attributed definitions.
 (b) Compare and contrast between quadruples and triples.
- 6 Explain in detail about Context sensitive features of languages?
- 7 Explain the following:
 - a) Redundant loads and stores
 - b) un reachable code
 - c) flow-of-control optimization
 - d) algebraic simplification.
- 8 Explain any three parameter passing mechanism techniques with suitable examples.

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III B. Tech I Semester (R09) Regular Examinations, November 2011
WEB PROGRAMMING
(Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is the difference between static and dynamic web pages?
(b) Write a HTML code to create a web page of your college.
- 2 (a) Explain about various objects in java script.
(b) Write a java script code for creating a digital clock.
- 3 (a) What are the different types of XNL schemas? Explain in detail.
(b) Compare XML with HTML.
- 4 What is Java beans? What are the core concepts of java beans?
- 5 (a) What are the characteristics of scripting languages?
(b) What are the advantages of Perl?
- 6 (a) Explain the difference between Perl and advanced Perl.
(b) In what way advance Perl is useful in designing a web page.
- 7 (a) What is TCL? Explain the syntax of TCL?
(b) Explain the expressions in TCL.
- 8 Write small notes on python language. What are the functions and built-in functions in python? Explain in detail.

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(Information Technology)

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- 1 (a) What is the need of static web pages?
(b) What are style sheets?
- 2 (a) What is the need of java script?
(b) Write a java script code for creating a dynamic web page of your profile.
- 3 (a) Discuss briefly about DOM and SAX.
(b) What is the difference between DHTML and the DOM?
- 4 (a) What are the properties and events of java beans?
(b) Explain java beans API.
- 5 What are the Perl scalar variables? Explain the each scalar variable with suitable example.
- 6 What is eval? What are the contents of eval explain in detail?
- 7 (a) Explain the control structure of TCL.
(b) Explain the string manipulation in TCL.
- 8 (a) Why python? Explain the mutable and immutable in python.
(b) Explain how to define a function in python.

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(Information Technology)

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- 1 Write the HTML code to generate a web page in the format given below. Consider the following while writing the HTML code:
 - 1) Background color of the page should be "BLUE".
 - 2) Text style should be comic sans MS and color should be RED.
 - 3) Picture used in the page is the file "activity.jpg".
 - 4) Table should have a border of color blue.
 - 5) Use the concept of nested lists for creating the list given in the web page with specified bullets.
 - 6) pages linked to:
 - Indoor activities as "in.html"
 - Outdoor activities as "out.html".
- 2 (a) What is the role of java script in World Wide Web?
(b) Explain any five event handlers in java script with example.
- 3 (a) What is DOM? Explain its usage in web page design.
(b) Discuss briefly about XML parsers.
- 4 (a) Discuss briefly about EJB's.
(b) What are the constrained properties of java beans?
- 5 Explain the following Perl variables:
(a) Arrays (b) Hashes (c) Control structures (d) Strings.
- 6 Explain the advanced Perl concepts:
 - (a) Finger points of looping.
 - (b) Pack and unpack.
 - (c) File system.
 - (d) Data structures.
- 7 (a) Explain the nuts and bolts of Internet programming.
(b) Describe TCL regular expressions and emphasizing advanced features.
- 8 (a) Explain about the integrated web application in python.
(b) Explain the python web application framework.

Code: 9A12502

III B. Tech I Semester (R09) Regular Examinations, November 2011
WEB PROGRAMMING
(Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Define cascading. Write a HTML tag for creating a table with the help of suitable example.
- 2 (a) Explain the relation between dynamic HTML and java script.
(b) What are the advantages of scripting language when compare with HTML?
- 3 (a) Differentiate between XML and HTML.
(b) Differentiate between DHTML and VRML.
- 4 (a) Write a short note on BDK.
(b) What are the advantages of java beans?
- 5 Explain the string processing in Perl.
- 6 What are the advanced Perl modules?
- 7 Explain the following advanced TCL concepts:
a) Eval.
b) Name spaces.
c) Trapping errors.
d) Event driven programs.
- 8 What is the need of python in web programming? How is useful in designing a web pages?
