

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2017

Paper Code: ETCS-302**Subject: Compiler Design****Time: 3 Hours****Maximum Marks: 75**

Note: Attempt any five questions including Q.No 1 which is compulsory.
Select one question from each unit.

- Q1 Attempt **any five** parts:- **(5x5=25)**
- Explain the process of Bootstrapping in compiler design with example.
 - Differentiate between SDD and SDT with example.
 - What is left recursion and left factoring? Explain each with example.
 - What is back patching? Explain with example.
 - What is the process of identifying basic blocks in code optimization phase?
 - Differentiate between top-down and bottom-up parsers with example.
 - Write a SDT for converting infix expression to post fix expression by taking suitable example.

UNIT-I

- Q2 (a) For the grammar given below:- **(7.5)**
- $$\begin{aligned} E &\rightarrow TE' \\ E' &\rightarrow +TE' \mid \epsilon \\ T &\rightarrow FT' \\ T' &\rightarrow *FT' \mid \epsilon \\ F &\rightarrow (E) \mid ID \end{aligned}$$
- Construct the LL(1) parsing table.
- (b) Check whether the following grammar is LL(1) or not **(5)**
- $S \rightarrow A \mid a, A \rightarrow a$
 - $S \rightarrow aSA \mid \epsilon, A \rightarrow c \mid \epsilon$

- Q3 (a) What do you mean by Handle? Check whether the grammar $E \rightarrow E + T \mid T, T \rightarrow a$ is LR(0) or not **(5)**
- (b) Construct a LR (1) parsing table for **(7.5)**
- $$\begin{aligned} S &\rightarrow Aa \mid bAc \mid dc \mid bda \\ A &\rightarrow d \end{aligned}$$

UNIT-II

- Q4 (a) Write an SDT to count the number of binary digits in a binary number. (Hint: 1011 count is 4) **(5)**
- (b) Differentiate between S-attributed and L-attributed SDT's. Write the steps to create the SDT for any problem and write SDT for converting any number from binary to decimal. **(7.5)**

- Q5 (a) What do you mean by three address code? Explain how the three address code is represented via quadruples, triples and Indirect triples with examples. **(7.5)**
- (b) Write the three address code for: **(5)**
- $\text{while}(a < 5) \text{do } a : b + 2$
 - $-a(a+b)*(c+d)+(a+b+c)$

UNIT-III

- Q6 (a) What do you mean by symbol table? Write an example that shows how different phases of compiler interact with symbol table. **(6)**
- (b) How the data is stored in symbol table for block and non-block structured languages? **(6.5)**

- Q7 (a) What are different types of errors that occurs during, lexical, syntactic and semantic phase. **(6)**

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- (b) What are the different storage allocation strategies in the runtime environment of the compiler? **(6.5)**

UNIT-IV

- Q8 (a) What do you mean by the term code optimization? What do you understand by the term leader? Write algorithm to identify out the basic Blocks. **(6)**

- (b) Identify the basic blocks in the following code and draw the DAG graph for the same: **(6.5)**

```
main()
{
    int i=0, n=10;
    int a[n];
    while(i<=(n-1))
    {
        A[i]=i*i;
        i=i+1;
    }
    return;
}
```

- Q9 (a) What do you mean by peephole optimization? Explain with example. **(6)**
 (b) What are the issues that occurs during the code generation process? **(6.5)**

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2017

Paper Code: ETCS-304

**Subject: Operating Systems
(Batch 2013 onwards)**

Time: 3 Hours

Maximum Marks: 75

**Note: Attempt any five questions including Q.No1 which is compulsory.
Select one question from each unit.**

- Q1** Answer the following short answer questions:- **(2.5x10=25)**
- (a) What do you mean by context switching?
 - (b) Explain the concept of pre-emption. Where it is needed?
 - (c) Discuss various types of resources.
 - (d) Describe the role of TLB in address translation.
 - (e) What is the utility of cache memory in the system?
 - (f) What is scheduling criteria for CPU scheduler?
 - (g) What do you mean by deadlock? Is it possible to have a deadlock in system involving only single process?
 - (h) Discuss various methods for maintaining free spaces on disk.
 - (i) Why is page size always a power of 2?
 - (j) What is Inode Table? Describe its contents.

UNIT-I

- Q2** (a) Describe working of paging memory management scheme. Compare paging with segmentation. **(6.5)**
- (b) Given memory partitions of 100 K, 500 K and 600 K (in order). Where will the algorithm, namely, best fit, first fit and worst fit place the processes 212K, 417 K, 112K and 426 K (in order) in the memory? Which one algorithm makes the most efficient use of memory? **(4)**
- (c) What is the cause of thrashing? What can the system do to eliminate the problem? **(2)**

- Q3** (a) Consider the following page reference string 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. How many page faults would occur for following replacement algorithm (Assume three frames): **(5)**
- (i) FIFO
 - (ii) LRU
 - (iii) Optimal
- (b) What do you mean by a page fault? What actions are taken by the operating system when a page fault occurs? **(3.5)**
- (c) Differentiate the following:
 (i) Networked and Distributed operating system.
 (ii) Multiprogramming and Multi-Processing operating system

UNIT-II

- Q4** (a) Consider the following set of processes, with the length of the CPU-burst time give in milliseconds: **(6.5)**

Process	Burst Time	Priority
P1	8	3
P2	1	1
P3	2	3
P4	4	2
P5	5	4

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P1/2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Draw the Gantt Chart and find the average turn around time and average waiting time of each process for the following scheduling algorithms:

- (i) FCS
 - (ii) Priority (Non-preemptive)
 - (iii) RR(quantum of 2ms)
 - (b) Describe Process state diagram. (3)
 - (c) What is the role of Medium term scheduler? (3)
- Q5 (a) What do you mean by Critical Section? What are various methods to handle critical section problem? Write a solution for Dining Philosophers problem using Semaphores. (8.5)
- (b) Discuss Dekker's Algorithm. (4)

UNIT-III

- Q6 (a) Consider the following snapshot of a system.

Process	Allocation			MAX			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

Answer the following questions using Banker's algorithm: (6.5)

- (i) Is the system in a safe state?
 - (ii) If a request from process P1 arrives for (3,3,0) can the request be granted immediately?
 - (b) What is the difference between deadlock avoidance and prevention? (3)
 - (c) How can the no-preemption and circular wait conditions be prevented? (3)
- Q7 (a) Suppose that a disk drive has 200 tracks numbered 0 to 199. The drive is currently serving a request at track number 100. The requested tracks, in order received by the disk scheduler are 55,58,39,18,90,160,38,184. What is the total distance (in tracks) that disk arm moves to satisfy all the pending requests, for each of the following disk scheduling algorithms? (6.5)
- (i) FCFS
 - (ii) SSTF
 - (iii) SCAN
 - (iv) C-SCAN
 - (v) LOOK
- (b) What are various parameters for evaluating Disk performance? Discuss. (4)
- (c) Why rotational latency is usually not considered in disk scheduling? (2)

UNIT-IV

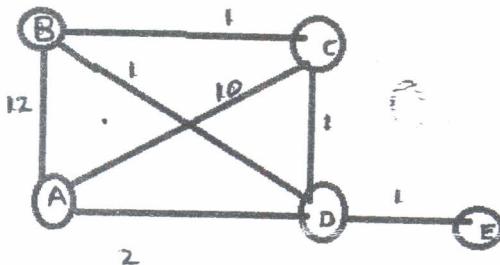
- Q8 (a) Describe various file allocation methods. Compare and contrast index allocation with contiguous file allocation scheme. (4.5)
- (b) Why directory structure is required? Discuss various types of directory structures along with respective merits and demerits. (4)
- (c) How data integrity is maintained? Explain. (4)
- Q9 (a) An operating system only supports a single directory but allows that directory to have arbitrarily many files with arbitrarily long file names. Can an approximate hierarchical file system be simulated? How? (4.5)
- (b) Some systems support many types of structures for file's data, while others simply support a stream of bytes. What are the advantages and disadvantages? (4)
- (c) Describe file access control mechanism. (4)

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2017

Paper Code: ETCS-306**Subject: Computer Networks****Time: 3 Hours****Maximum Marks: 75****Note: Attempt any five questions including Q.No1 which is compulsory.**

- Q1 (a) How flow control is different from congestion control? (3)
 (b) Difference between bit rate and baud rate? Explain with example. (3)
 (c) What is difference between Classful addressing and Classless IP addressing? (4)
 (d) What are major advantages of STP over UTP? (2.5)
 (e) Differentiate between Intranet, Internet and internet? (2.5)
 (f) Difference between baseband transmission and broad band transmission? (2.5)
 (g) What do you mean by Network Topology? Discuss the problems and benefits of any three topologies? (4.5)
 (h) What is routing? Differentiate between distance vector routing and link state routing? (3)
- Q2 (a) Calculate the throughput of the pure and slotted ALOHA channel. Which Channel gives better throughput and why? (6)
 (b) Define Stop and Wait ARQ protocol. Explain the reason for moving from Stop and wait ARQ protocol to the GO-Back-N ARQ protocol? (6.5)
- Q3 (a) Contrast and Compare ISO-OSI and TCP/IP networking models? (6.5)
 (b) What is the need for adaptive routing algorithms? Explain in details? (6)
- Q4 (a) Explain ATM reference model? Why does ATM use small fixed length cell? What is ATM signaling? (6.5)
 (b) Write short notes on ISDN? (4)
 (c) What is Tunneling? (2)
- Q5 (a) Given the network topology below use the Dijkstra's algorithm to compute the shortest path from A to all other nodes. Make sure to show the results of the computations at each step. (6.5)



- (b) What is collision? How does CSMA/CD detect and correct collision? (6)
- Q6 (a) Draw and explain packet format of Transmission control protocol? Explain various steps that are followed in releasing a TCP connection? (8)
 (b) Why transport layer protocols like TCP and UDP are called end-to-end protocols. What is the difference between them? (4.5)
- Q7 (a) Explain the Leaky bucket algorithm to control congestion. Explain how the drawbacks of this are overcome in token bucket algorithms? (6.5)
 (b) What is the maximum number of subnets in each case?
 (i) Class A; mask 255.255.192.0
 (ii) Class B; mask 255.255.192.0
 (iii) Class C; mask 255.255.255.192
 (iv) Class C; mask 255.255.255.240
- Q8 (a) Difference between IPV4 and IPV6? Draw and explain the IPV4 protocol packet format? (8.5)
 (b) Evaluate the maximum bit rate for a channel having bandwidth 3100Hz and S/N ratio of 20 dB. (4)

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SIXTH SEMESTER [B.TECH] MAY- JUNE 2017

Paper Code: ETCS-308**Subject: Web Engineering****Time: 3 Hours****Maximum Marks: 75****Note: Attempt any five questions including Q.No1 which is compulsory.**

- Q1 (a) State the difference between Internet and World Wide Web. (2)
 (b) What is the difference between HTML and XHTML? (2)
 (c) What are the different components of CSS? (3)
 (d) What is NaN? (1)
 (e) Name any three predefined JSP tags. (3)
 (f) Briefly explain lifecycle of a Servlet? (3)
 (g) What are Plugins? (2)
 (h) What are the technologies used in Web 2.0? (3)
 (i) What are widgets? (2)
 (j) What do you mean by parameter tampering? (2)
 (k) What is fuzzer? (2)
- Q2 (a) What are the limitations of HTML? (4)
 (b) Describe CSS Box Model with an example. (5)
 (c) Explain DHTML and its features. (3.5)
- Q3 (a) Discuss XML and XSLT with an example. (7.5)
 (b) What is DTD? (2.5)
 (c) What is WML? (2.5)
- Q4 (a) Create a student registration form in HTML and validate the name and email field using JavaScript. (7.5)
 (b) Explain the concept of event handling in JavaScript. (5)
- Q5 (a) Explain the architecture of Servlets? Differentiate between doPost() and doGet(). (3.5+4=7.5)
 (b) Write a program to print HELLO WORLD using JSP. (5)
- Q6 (a) What are the primary security controls? (4.5)
 (b) What are the different types of security threats and what are their possible solutions? (4+4=8)
- Q7 (a) What is session management? What is session hijacking? How can it be prevented? (6.5)
 (b) What are the features Wireless Application Firewalls? (6)
- Q8 (a) Explain web syndication. (6)
 (b) Why Web 3.0 is referred as semantic web? How is web 3.0 different from Web 2.0? (2.5+4=6.5)

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2017

Paper Code: ETCS-310**Subject: Artificial Intelligence****Time: 3 Hours****Maximum Marks: 75**

Note: Attempt any five questions including Q.No 1 which is compulsory.
Select one question from each unit.

Q1 Give short answers:- (5x5=25)

- (a) Explain Problem solving in AI.
- (b) Explain different AI Techniques.
- (c) How is Unification used in resolution? Explain with example.
- (d) Explain iterative deepening in 8 puzzle problem.
- (e) What is PEAS? Specify for Aerospace System.

UNIT-IQ2 Explain Constraint satisfaction problem. Solve the Crypt arithmetic puzzles. (12.5)

(i) SOME TIME	(ii) GIVE THEM
<u>SPENT</u>	<u>HELP</u>

Q3 Explain Hill Climb Search. What is role of plateau and ridge in hill climbing? (12.5)

1	3	4
7	2	6
5	8	

UNIT-II

Q4 (a) Compare Forward Chaining with Backward Chaining. (6.5)
 (b) Assume that "Ram is neither hardworking nor intelligent". Using resolution to prove that Ram does not get a job. (6)

Q5 (a) Represent Following facts as predicates: (8)

- Marcus was man
- Marcus was a Pompeian
- All Pompeians were Romans
- Caesar was Ruler
- All Romans were either loyal to Caesar or hated him.
- Everyone is loyal to someone.
- People only try to assassinate Caesar.

(b) Was Marcus loyal to Caesar? If yes, Construct the proof by backward chaining. (4.5)

UNIT-III

Q6 (a) Explain Architecture of Expert Systems. Explain MYCIN in brief. (6)
 (b) Explain Different methods of Theorem Proving. (6.5)

Q7 (a) Explain Chomosky hierarchy of languages. (3)
 (b) Generate Parse Tree for the sentence 'Jatin went to movie with Beena' using grammar:
 $S \rightarrow NP VP$
 $NP \rightarrow Noun / prep\ NP / Noun\ NP / the\ NP / Pronoun$
 $VP \rightarrow Verb\ NP / Verb$
 $prep \rightarrow with / to$

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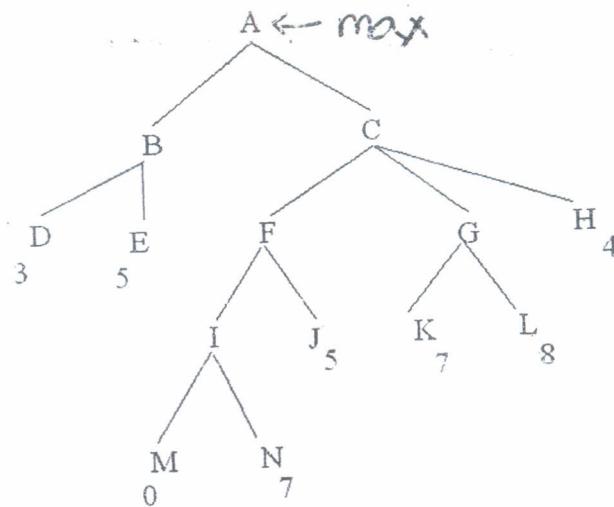
Verb → went/print/create

Pronoun → I/We

Noun → Jatin/Beena/radio/story

- (c) Perform minimax on following tree. Explain each step.

(5.5)



UNIT-IV

- Q8 Explain different types of learning with examples.

(12.5)

- Q9 Explain Application of AI in following AI in following fields:

(a) Robotics

(4)

(b) Aerospace

(4)

(c) Medical Sciences

(4.5)

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SIXTH SEMESTER [B.TECH] MAY-JUNE 2016

Paper Code: ETCS-302

Subject: Compiler Design

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q.no. 1 which is compulsory.
Select one question from each unit.

Q1 Attempt all 10 questions. **(10x2.5=25)**

- (a) Distinguish between compiler and interpreter. Define Cross Compiler and identify the few cases where such cross compiler will be useful.
- (b) Design the Finite Automata for the regular expression $a(a + b)a$.
- (c) Mention the role of Lexical Analyser in compiler design.
- (d) What compiler check during the syntax analysis? Mention the role of parser with the help of suitable figure during the syntax analysis.
- (e) Define ambiguity in a grammar.
- (f) What are the advantages of performing the LR parsing?
- (g) Define FIRST and FOLLOW sets for a grammar.
- (h) Perform recursive descent parsing over the input **mpp** for the grammar.

$$\begin{aligned} S &\rightarrow XY \\ X &\rightarrow m \mid mY \\ Y &\rightarrow p \end{aligned}$$

- (i) What is Peephole optimization? How is it performed? Give example of peephole optimization.
- (j) What is DAG? What are the advantages of using DAG?

UNIT-I

Q2 (a) Design a derivation tree for the following grammar: **(5)**
 $E \rightarrow E+E \mid E-E \mid E/E \mid E^*E \mid a \mid b$. Also obtain the left most and rightmost derivation tree for the string "a + b * a + b".

(b) Find whether the grammar is ambiguous or not: **(7.5)**
 $S \rightarrow AB \mid aaB, A \rightarrow a/Aa, B \rightarrow b$
How to remove ambiguity from this grammar.

Q3 (a) Consider the following grammar and Parse the input string int id, id; using shift reduce parser. **(5)**
 $S \rightarrow TL; T \rightarrow int \mid float \quad L \rightarrow L, id \mid id$

(b) Discuss all three methods which are used to perform the LR parsing. Which technique is most powerful among these three? Give justification also. **(7.5)**

UNIT-II

Q4 What are the benefits for the three address code generation? Consider the input string $x: = - a * b + - a * b$ and generate the following: **(12.5)**

(a) Syntax Tree (b) Posix (c) Three address Code

Q5 (a) Draw the Syntax tree for the following piece of code in the source language:
If $x > y$ then $x = 3 * (y+1)$ else $y = y+1$. **(2.5)**
(b) Write short comments on:- **(10)**

(i) LEX
(ii) YACC

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UNIT-III

- Q6 What is the significance of symbol table in compiler? What information is represented by symbol tables? Explain the data structure used for symbol tables. (12.5)
- Q7 What is activation record? Briefly outline Run time storage administration. Discuss different error handling techniques. (12.5)

UNIT-IV

- Q8 What are the criteria that need to be considered while applying the code optimization technique? Mention the issues involved in designing of code generation. (12.5)
- Q9 Draw the Syntax Tree and DAG for the expression $(a * b) + (c - d) * (a * b) + b$ (12.5)
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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2016

Paper Code: ETCS 304

Subject: Operating Systems

Time : 3 Hours

Maximum Marks :75

Note: Attempt any five questions including Q.No 1 which is compulsory.

Q1. Answer the following:

- a) Compare multi-programmed batch systems and time sharing systems. (2)
- b) Mention any four categories of system program. Explain them. (2)
- c) Explain Memory Management Strategies. (2)
- d) Explain the process between mapping of Logical Address space and Physical Address space. (2)
- e) How does many-to-one thread model differ from one-to-one model? Explain. (3)
- f) Mention the necessary conditions for a deadlock situation to arise. (2)
- g) Compare FA32 and NTFS file systems. (2)

Q2. a) Explain the features of parallel systems and distributed systems. (5)

- b) Compare contiguous versus non-contiguous memory allocation techniques. (6)
- c) Explain the address generation in segmentation with paging. (4)

Q3. a) Explain any two page-replacement algorithms. Give an illustration. (5)

- b) Mention the causes that effect thrashing. How does the degree of multiprogramming and CPU utilization effect thrashing. (2+2)
- c) Explain the process scheduling. Draw the process state diagram. (3+3)

Q4. a) Explain various types of Inter-process Communication. Give an illustration for each. (6)

- b) The following processes arrive for execution at the times indicated below. (6)

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

Use non-preemptive scheduling to answer the following:

- i) What is the average turnaround time for these processes with FCFS scheduling algorithm?
- ii) What is the average turnaround time for these process with SJF scheduling algorithm?
- c) Show that, if the wait and signal operation are not executed atomically (in process synchronization), then mutual exclusion may be violated. (3)

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P1/2

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- Q5. a) Consider a system consisting of m resources of the same type, being shared by n processes. Resources can be requested and released by processes only one at a time. Show that the system is deadlock-free if the following two conditions hold: (6)
- i) The maximum need of each process is between 1 and m resources
 - ii) The sum of all maximum needs is less than $m+n$.
- b) Write Banker's algorithm to decide whether a system is a safe state. (5)
- c) Consider a system consisting of four resources of the same type that are shared by three processes, each of which needs at most two resources. Show that the system is deadlock-free. Give an illustration. (4)
- Q6. a) Explain the following disk scheduling algorithms: (6)
i) FCFS
ii) SSTF
iii) C-SCAN
- b) Explain the role of Caching and Buffering used in device management. Mention their respective attributes. (3+2=5)
- c) Explain the recovery techniques used in deadlock. (4)
- Q7. Write short notes on any three of the following: (3x5=15)
- a) Two-Level Directory Structure
 - b) File organization techniques
 - c) File access control
 - d) Data Integrity Protection
 - e) Explain Multilevel Feedback Queue Scheduling. Give its applications.

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2016

Paper Code: ETCS-306

Subject: Computer Networks

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q.No1 which is compulsory.

- Q1 Attempt all:
- (a) Differentiate between circuit switching, packet switching and message switching. (5)
 - (b) Differentiate between adaptive and non-adaptive routing algorithms. (5)
 - (c) Explain parity bit error detection method in detail. (5)
 - (d) Differentiate between narrowband ISDN, broadband ISDN (5)
 - (e) Explain Subnetting using an example. (5)
- Q2 (a) Compute the CRC for a 10-bit sequence 1010011110 and a divisor of 1011. (6)
- (b) Give the header format of ATM Cell. Also explain the semantics of each field in the header. (6.5)
- Q3 Explain Channel allocation problem and its solution algorithm in detail. Provide an example to illustrate the problem and its solution. (12.5)
- Q4 (a) Discuss the various issues in designing Data link layer in detail. (6)
- (b) Explain sliding window protocol in detail and using an example. (6.5)
- Q5 Explain the following cables in detail.
- (a) Baseband Coaxial Cable (4)
 - (b) Broadband Coaxial cable (4)
 - (c) Fiber cable (4.5)
- Q6 Explain the network layer in the internet and the network layer in ATM networks in detail. Differentiate in between these two:- (12.5)
- Q7 A router has the following (CIDR) entries in its routing table-
- | Address/Mask | Next Hop |
|----------------|-------------|
| 135.46.56.0/22 | interface 0 |
| 135.46.60.0/22 | interface 1 |
| 135.53.40.0/22 | Router 1 |
| Default | Router 2 |
- For each of the following IP addresses, what does the router do if a packet with that address arrives? (12.5)
- (i) 135.46.63.10
 - (ii) 135.46.57.14
 - (iii) 135.46.52.2
 - (iv) 192.53.40.7
 - (v) 192.53.56.7
- Q8 Write short notes on any two of the following: - (6.25x2=12.5)
- (a) Domain Name Registration & Registrars
 - (b) Satellite networks
 - (c) Network devices

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2016

Paper Code: ETCS-308

Subject: Web Engineering

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q.No1 which is compulsory.

- Q1** Attempt all:
- How does XHTML differ from HTML? (5)
 - Differentiate between server side scripting and client side scripting. (5)
 - Explain the usage of Plugins, extensions, and web apps. (5)
 - How does the JMS API Work with the JAVA EE Platform? (5)
 - List two advantages and two disadvantages of dynamic script loading(5)
- Q2** (a) Discuss the application of Web Engineering Technologies in distributed systems. (6)
(b) Explain and discuss the various issues in WEB Security. (6.5)
- Q3** Create a HTML form that has the following controls: (12.5)
 - A TEXT control called firstName to collect the first name.
 - A TEXT control called lastName to collect the last name.
 - A TEXT control called email to collect the email address.
 - A TEXT control called phone to collect the phone number.
 - A SELECT control called software for displaying a combo box with software list.
 - A SELECT control called os for displaying a combo box with operating systems.
 - A TEXTAREA control called txtArea for displaying problem description.
 - A SUBMIT control called submit for submitting the information.
- Q4** (a) Discuss and explain Web security model in detail. (6.5)
(b) Explain the following:
 - HTTPS and certificates
 - HTTP security extensions
- Q5** Explain the following in respect to JAVA (12.5)
 - JAVA Servlets
 - Intrinsic event handling
 - JSP
- Q6** Define the following terminology- (12.5)
 - Document trees
 - CSS style sheets
 - DNS and URL
- Q7** (a) Discuss the procedure to maintain the concurrency issues in a Website? (6.5)
(b) Explain any tool for maintaining Server-side security and client side security. (6)
- Q8** Write short notes on any two of the following:- (6.25x2=12.5)
 - Web application Firewalls (WAFs) and Fuzzers
 - Latest Trends in Web Technologies
 - Web attacks and their prevention

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2016

Paper Code: ETCS 310

Subject: Artificial Intelligence

Time : 3 Hours

Maximum Marks :75

Note: Attempt any five questions including Q.No. 1 which is compulsory.
Select one question from each unit.

- Q1.** Write short note on the following: **(2.5x10=25)**
- How does the Artificial Intelligence (AI) solves problems for which no practically feasible algorithm exist?
 - How is an expert system different from other conventional software?
 - Differentiate between knowledge base and data base.
 - Differentiate between strong AI and weak AI.
 - Explain Turing test for AI.
 - What is heuristic search? Give an example.
 - What do you mean by reasoning under uncertainty?
 - What are the characteristics of knowledge representation system?
 - What are alpha beta cutoff in game tree?
 - Explain Minimax algorithm for game tree.

Unit-I

- Q2.** a) Explain origin and history of Artificial Intelligence. **(2.5)**
- b) Write and explain state space search formulation of well known water jug problem. **(5)**
- c) Describe the production rule for solving above problem. Demonstrate the working of Breadth-first search on water jug problem (Assume start and goal state). **(5)**
- Q3.** a) Explain constraint satisfaction algorithm using cryptarithmetic problem. **(5)**
- b) Write and explain A* algorithm. Is A* algorithm guaranteed to find an optimal goal path if one exists. Explain giving examples. **(7.5)**

Unit-II

- Q4.** a) Explain the inference rules in propositional logic. **(5)**
- b) Solve the following problem with the help of these rules. Test the validity of following argument: "If milk is black, then every cow is white. If every cow is white then, it has four legs. If every cow has four legs, then every buffalo is white. The milk is black. Therefore, the buffalo is white". **(7.5)**
- Q5.** a) Explain the rules to unify two predicates. **(3.5)**
- b) Represent following facts as predicates and convert them to clause form, explaining the steps of conversion. **(5)**
- Any student who is intelligent or hard working will pass the exam in good marks.
 - Any student who is passed with goods marks gets a job.
- c) Assume that 'Mukesh is neither hard working nor intelligent'. Using resolution prove that Mukesh does not get a job. **(4)**

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Unit-III

- Q6. What is an expert system? Describe various components of an expert system. Mention some advantages. (12.5)
- Q7. What do you mean by Natural Language Processing (NLP)? Explain its analysis techniques. Discuss some applications of NLP. (12.5)

Unit-IV

- Q8. a) What are the different types of learning? Explain with examples. (10)
b) What are the different applications of Artificial Intelligence? (2.5)
- Q9. Write short note on the following:
a) Learning process in Artificial Neural Networks (5)
b) Learning process in Genetics Algorithms (5)
c) Learning process in Data Clusterization (2.5)

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