T.E (COMPUTER) (SEM V) EXAMINATION, OCTOBER, 2013

LJ-11341 Computer Network

Monday,
2nd December, 2013. Time: 3.00 pm to 6.00 pm

T.E (COMPUTER) (SEM V) EXAMINATION, OCTOBER, 2013

LJ- 11377 Theory of Computer Science

Saturday,
7th December, 2013. Time: 3.00 pm to 6.00 pm

T.E (COMPUTER) (SEM V) EXAMINATION, OCTOBER, 2013

LJ- 11422 Web Engineering

Thursday,
12th December, 2013 Time: 3.00 pm to 6.00 pm

T.E (COMPUTER) (SEM V) EXAMINATION, OCTOBER, 2013

LJ- 11260 Advanced Database Management System

Thursday,
21st November, 2013. Time: 3.00 pm to 6.00 pm

T.E (MECHANICAL, ELECTRICAL, PRODUCTION, ELECTRONICS, COMPUTER, INSTRUMENTATION, BIOMEDICAL, AUTOMOBILE, ELECTRONICS & TELECOMMUNICATION, INFORMATION TECHNOLOGY & MARINE) (SEM V) EXAMINATION, OCTOBER, 2013

LJ- 11450 Environmental Studies

Wednesday,
18th December, 2013 Time: 3.00 pm to 5.00 pm

Con. 6757 - 13. **LJ-11260**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory.**
(2) Solve any **four** from Question Nos. **2** to **7.**
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume any suitable **data** wherever **required.**

1. (a) Explain different types of transparencies in distributed databases. **10**
Consider the following schema :–
Emp (eno, ename, title)
Proj (pno, pname, budget, Loc)
Pay (title, salary)
Assignment (eno, pno, responsibility, duration)
(i) Give 2 examples of horizontal and vertical fragmentation each.
(ii) Give the derived horizontal fragmentation on emp & pay relation. Write the resultant fragments.
(b) Explain heuristic approach of query processing with relevant examples. **10**

2. (a) Explain Hash join and External Sorting algorithm in detail. **12**
(b) Explain conceptual design phase of database life cycle. **8**

3. (a) In SQL3 how the type inheritance and table inheritance implemented?Explain with suitable examples. **10**
(b) Explain left, right, outer, inner, equi join, pattern matching with example. **10**

4. (a) Draw and explain architectures for parallel databases. **10**
(b) Explain mapping of Generalization, Specialization, Union/category with relevant examples. **10**

5. (a) Consider the following DTD :–
<!DOCTYPE Parts [
<!ELEMENT part (name, subpartinfo*)>
<!ELEMENT Subpartinfo (part, quantity)>
<!ELEMENT name (# PCDATA)>
<!ELEMENT quantity (# PCDATA)>
] >
(i) Give a small example of data corresponding to the above DTD. **5**
(ii) Show how to map this DTD to a relational schema. You can assume that part names are unique. **5**
(b) Discuss deadlock handling techniques in distributed database. **10**

[TURN OVER

6. (a) Explain cost functions for SELECT operation. **10**
   (b) Compare RDBMS, OODBMS and ORDBMS. **10**

7. Write a short notes on (any **four**) :- **20**
   (a) Nested Relations.
   (b) XQuery
   (c) EXIST and NOT EXIST.
   (d) Client - Server architecture.
   (e) Bloom Join Techniques.

Con. 6799–13. **LJ–11341**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from the **remaining** questions.

1. Answer any **four** :– **20**
   (a) What are the different categories of the network classification ?
   (b) Compute the Hamming Code for the data – 1001101.
   (c) State the reasons for having a minimum length requirement for a frame in Ethernet. How is it achieved ?
   (d) What are the advantages and disadvantages of hierarchical routing ?
   (e) State the reasons why Network layer and Transport layer are kept as two distinct layers even though their services are so similar.

2. (a) Explain the functions of the different Network Hardware Components. **10**
   (b) Explain sliding window protocol. Draw the sender and receiver windows for a system using Go-Back-N sliding window (size = 8) given that – **10**
      (i) frame 0 is sent; frame 0 is ACK
      (ii) frame 1 and 2 are sent; frames 1 and 2 are ACK
      (iii) frame 3, 4, 5 are sent; frame 4 is ACK.
      (iv) timer for frame 5 expires.
      (v) sender resets the window and 4 more frames are sent.

3. (a) Make a comparitive study of Switched ethernet, Fast ethernet and Gigabit Ethernet. **10**
   (b) Draw and explain the architecture and protocol stack of Bluetooth. **10**

4. (a) What are the steps involved in Link state routing. Explain the contents and the requirements of Link state packets. **10**
   (b) Explain the various methods for congestion control used in datagram subnets. **10**

5. (a) Show the different protocol scenarios for establishing a connection using 3-way handshake in the transport layer. **10**
   (b) Explain the different protocols in the MAC sublayer which uses carrier sensing. **10**

6 (a) Show the usage of the different socket programming primitives used for establishing a connection between client and server. **10**
   (b) Explain HDLC protocol. **10**

7. Write notes on (any **four**) :– **20**
   (a) Satellite Networks
   (b) QoS requirements
   (c) IP header format.

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Con. 7047-13. **LJ - 11377**

(3 Hours) **[Total Marks : 100**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining **six** questions.
(3) **Assumptions** made should be **clearly** stated.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) Define with examples Moore and Mealy machine. **5**
(b) Find the equivalent DFA accepting the regular language defined by right linear grammar given as:– **5**

$S \rightarrow aA|bB$

$A \rightarrow aA|bC|a$

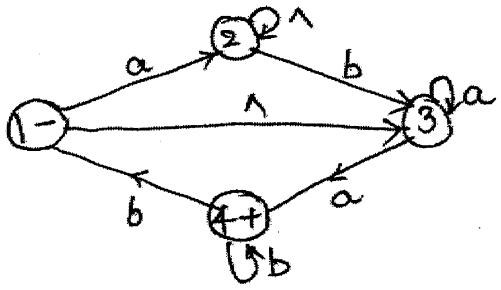
$B \rightarrow aB|b$

$C \rightarrow bB$

(c) State and prove pumping Lemma theorem for regular language. **5**
(d) Differentiate between Deterministic PDA and Non-deterministic PDA. **5**

2. (a) Design a finite state machine to determine whether a ternary number base 3 is divisible by 5. [**Hint**: $\Sigma = \{0,1,2\}$] **10**
(b) Design a Mealy machine for the language (0+1)* (00+11) and convert it to a Moore machine. **10**

3. (a) Convert the following NFA with $\in$ moves to DFA :- **10**



(b) Let G be the grammar. G = {(S, X), {a,b}, P, S} where productions are:– **10**

$S \rightarrow aSX|b$

$X \rightarrow Xb|a$

Find:– (i) Leftmost derivation. (ii) Rightmost derivation and
(iii) Parse tree for the string "aababa".

[TURN OVER

4. (a) Design turing machine for the language $L=\{a^n b^n | n>=1\}$ **10**

   (b) Design a turing machine to compare the binary numbers m and n such that if (m > n) output is G, if (m < n) output is L and when (m = n) output is E. **10**

5. (a) List and explain decision properties of regular language. **10**
   Explain the test for checking emptiness of a regular language.

   (b) Construct left linear and right linear grammar for the regular expression :- **10**

   $$(((01 + 10)^* 11)^*00)^*$$

6. (a) Construct a PDA equivalent to following grammar:– **10**

   $S \rightarrow oBB$

   $B \rightarrow OS|IS|O$

   and show the acceptance of 010^4 by the PDA.

   (b) Reduce the following grammar to Greibach Normal form. **5**

   (i) $S \rightarrow AB$

   $A \rightarrow BSB|BB|b$

   $B \rightarrow a$

   (ii) $S \rightarrow 01S|01$ **5**

   $S \rightarrow 10S|10$

   $S \rightarrow 00|\wedge$

7. Write short notes on (any **four**):– **20**
   (a) Post Correspondence Problem
   (b) Chomsky Hierarchy
   (c) Universal turing machine
   (d) Recursive and Recursively emurable language
   (e) Classes of complexity.

Con. 7067-13. **LJ-11422**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question 1 is **compulsory**.
(2) Answer any **Four** from remaining questions.

1. (a) Explain interaction design by considering all aspects of web applications. **10**
   (b) Explain XML schema, DTD and X SL with example. **10**

2. (a) Explain test approcaches with characteristics of web application. **10**
   (b) Define web application. Explain characteristics of web application. **10**

3. (a) How SMIL can be effective in web application development? **10**
   (b) What do you mean by user Interface organization? Explain. **10**

4. (a) What are components of generic web application? Explain with suitable example. **10**
   (b) Explain adapting requirement engineering method to web application development for requirement types. **10**

5. (a) Explain in detail customization modeling and its relation to content, Hypertents and presentation modeling. **10**
   (b) What is streaming technology? Explain media architecture using point to point connection and broadcasting infrastructure. **10**

6. (a) What are problems and restrictions in Integrated web design? **10**
   (b) Write HTML code which include table, hyperlink, character formatting and ordered, unordered list. **10**

7. Write short notes on (any **two**) :- **20**
   (a) Project Tracking
   (b) Analysis modelling
   (c) SOAP protocol

Con. 7101-13. **LJ-11450**

(2 Hours) **[Total Marks : 50**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from Question Nos. **2** to **7**.
(3) Draw **suitable** sketches wherever **required**.
(4) **Figure** to the **right** indicates **full** marks.

1. Answer any **five** of the following:– **10**
   (a) Explain the concept of food chain with suitable example.
   (b) What are the causes and effects of E-pollution?
   (c) Differentiate between : Renewable and Non-renewable energy resources.
   (d) What is sustainable development? What are its benefits?
   (e) Explain the term 'Hot Spots of Biodiversity'.
   (f) What are the functions of State Pollution Control Board.
   (g) Why thermal pollution is growing? How it can be controlled?

2. (a) Explain briefly the characteristic features of forest ecosystem. How forest ecosystem can be conserved? **5**
   (b) Why there is need for water conservation? Explain briefly how rain water harvesting can be carried out? **5**

3. (a) How marine pollution is caused? Explain adverse effects caused on account of it. **5**
   (b) What is disaster management? How these techniques can be implemented in the event of cyclone. **5**

4. (a) Explain briefly the salient features of Air Pollution Prevention and Control Act. **5**
   (b) Why global warming is taking place? What are the adverse effects produced by it? **5**

5. (a) What is Biodiversity? Explain the important values of biodiversity. **5**
   (b) How acid rain is formed? What adverse effects are produced on account of it. **5**

6. (a) What role is played by Information Technology to the field of human health and environment. **5**
   (b) Explain structural and functional aspects of an ecosystem. **5**

7. (a) What is solid waste? Explain the methods to control solid waste. **5**
   (b) List important air pollutants. What are their sources and how do they affect us? **5**
