

N.B. : N.B : (1) Question No.1 is compulsory.

(2) Solve any *four* questions from the remaining six questions.

- Q.NO:1) A)What are streaming technologies? Explain streaming media architecture using point to point connection & broadcasting infrastructure. (10 marks)**
- B) Explain functional design for web applications. (10 marks)**
- Q.NO:2) A) Explain test approaches with characteristics for web application. (10 marks)**
- B)What are the advantages & disadvantages of automated tests. (05 marks)**
- C)Explain objectives of load, stress& continuous testing . (05 marks)**
- Q.NO:3) A)Explain interaction design by considering User Interaction aspect for web application. (06 marks)**
- B) Define web application & web Engineering. (04 marks)**
- C) Explain different categories of web application by giving suitable example.(10 marks)**
- Q.NO:4) A) Explain in detail content modeling & access modeling with diagram (10 marks)**
- B) Explain XML DOM & XML schemas with example. (10 marks)**
- Q.NO:5) A) Explain client side technologies. (10 marks)**
- B) Explain following web services in details.(i)SOAP (ii)WSDL (iii)UDDI (10 marks)**
- Q.NO:6) A) Define requirements engineering & explain requirements engineering activities for web application. (10 marks)**
- B) Enlist project risks in web project according to J. Nielsen. (05marks)**
- C) Explain tasks involved in risk management. (05 marks)**
- Q.NO:7) A) Explain with diagram basic components of web application architecture. (10 marks)**
- B) Explain struts with diagram. (05 marks)**
- C) Explain hypertext structure. (05 marks)**

Computer Net
(REVISED COURSE)

GT-6699

Con. 5556-10.

(3 Hours)

[Total Marks : 100]

N. B. : (1) Question No. 1 is compulsory.

(2) Attempt any four out of remaining six questions.

(3) Figures to the right indicate marks.

1. (a) Describe any five design issues for the Layers. 05
 (b) What is the essential difference between Message Switching and Packet Switching? 05
 (c) Why does the Data Link protocol always put the CRC in a trailer rather than in a header? 05
 (d) A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle? Explain. 05
2. (a) Describe the OSI Reference Model with a neat diagram. 10
 (b) Discuss the difference between ADSL and Cable for use in Cable Television. 05
 (c) Explain the different Framing Methods. 05
3. (a) An 8-bit byte with binary value 10101111 is to be encoded using an even-parity Hamming code. What is the binary value after encoding? 05
 (b) Explain ALOHA in detail. 05
 (c) Explain Sliding Window Protocol using Go Back -N technique. 10
4. (a) Discuss the different ways to allocate a Single Broadcast Channel among competing users. 05
 (b) Discuss the working of Switched Ethernet with suitable example. 10
 (c) Discuss the use of Spanning Tree Bridges in Data Link Layer Switching. 05
5. (a) A router has the following (CIDR) entries in its routing table 10

Address/Mask	Next Hop
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
192.53.40.0/23	Router 1
Default	Router 2

For each of the following IP addresses, what does the router do if a packet with that address arrives?

i. 135.46.63.10	ii. 135.46.57.14
iii. 192.53.40.7	iv. 192.53.56.7
- (b) How does the Token Bucket algorithm works? 05
 (c) Discuss the Quality-of-Service requirements for Audio on Demand. 05
6. (a) What is the function of TCP Protocol? Discuss its Header format. 10
 (b) Discuss the Window Management in TCP transmission policy with a neat diagram. 05
 (c) Discuss the working of Transactional TCP. 05
7. Write short notes on (ANY FOUR):- 20
 - (a) Features of IPV6 Protocol.
 - (b) Difference between Hubs and Switches.
 - (c) Bluetooth Architecture.
 - (d) 802.11 Frame Structure.
 - (e) Adhoc Networking.

TE/Com/Sem-I/Rev (3 Hours)

N.B. : (1) Question No. 1 is compulsory. *Microprocessor*
 (2) Solve any four out of remaining six questions.

1. A) Interface 2 Input and 2 Output ports of 16 bits each which can be used in hand shaking mode with Intel 8086 microprocessor. Show IO Map and IO Address table. 5
- B) Explain addressing modes of Intel 8085 microprocessor with example 5
- C) Explain tightly coupled multiprocessor configuration. 5
- D) Answer the following questions in brief:
 - A) What type number and interrupt vector table addresses are assigned to NMI ? 1
 - B) Write an instruction that will mask off all bits but bit 7 of the data word stored at address DS:0100H. 1
 - C) Explain the differences between Intel 8086 and 8088 processors. 2
 - D) Explain ORG assembler directive. 1
2. A) Design a 8086 based microprocessor system with the following specifications:- 10
 - A) 8086 is working at 8 Mhz.
 - B) 32KB EPROM using 16 KB devices.
 - C) 64KB SRAM using 32 KB devices.
 Explain the design and show memory map.
- B) Write an assembly ~~language~~ program for Intel 8086 processor to exchange the blocks of 10
 1 KB located at 0100H and 0200H, using string instructions.
3. A) Draw interfacing diagram of 3 Programmable interrupt controllers connected to Intel 8086 microprocessor and explain it's working with CPU. 10
- B) Explain the concept of DMA. Explain various operating modes of 8237A. 10
4. A) Explain with diagram the signals' carried by the individual pins of port C of 8255A when port A and port B are working in mode 1. 10
- B) Explain the modes of operations' of 8254. 10
5. A) Explain the different ways in which the parameters are passed on to the procedure. Write an interactive assembly language program to find the factorial of a given number using far procedure. 10
- B) Explain the different bus arbitration techniques with their advantages and disadvantages. 10
6. A) Explain the control word format of 8254 and explain it's operation in mode 0 with a neat diagram. 10
- B) Explain any 2 instructions of the following with example. Clearly state the way different flags are affected when they are executed: 06
 - A) DAS
 - B) IDIV
 - C) XLAT
 - D) TEST
- C) Explain the following assembler directives: 04
 - A) ASSUME
 - B) EVEN
7. Explain the following: 20
 - A) IEEE 488 GPIB
 - B) Difference between memory mapped IO and IO mapped IO.
 - C) RS 232 C Serial interface standard
 - D) Memory segmentation in Intel 8086

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions from remaining **six** questions.
 (3) Draw **suitable** diagrams wherever **necessary**.
 (4) Assume **suitable** data, if **necessary**.

Q1. (a) Explain different types of machines and state at least one application of each (10)

(b) Let G be the grammar. Find the leftmost derivation, rightmost derivation and parse (10)

tree for the string 00110101

G: $S \rightarrow 0B \mid 1A$

$A \rightarrow 0 \mid 0S \mid 1AA$

$B \rightarrow 1 \mid 1S \mid 0BB$

Q2. (a) Design a DFA to accept (10)

- (i) a set of all strings with odd number of ones followed by even number of zeros
 (ii) a set of all strings with which begin and end with different letters $\Sigma = \{x, y, z\}$

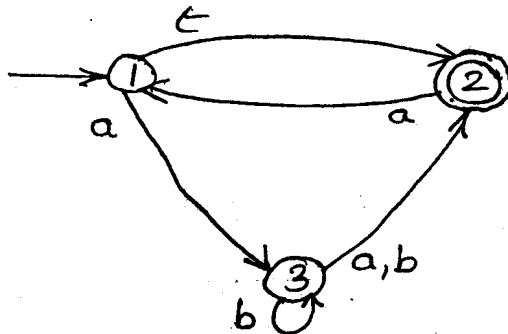
(b) What is a regular expression? Give formal definition of a regular expression. Design a (10)

DFA corresponding to the regular expression $(a+b)^* aba(a+b)^*$

Q3. (a) Design a Moore and Mealy machine to convert each occurrence of a substring abb by aba (10)

(b) Convert the following NFA with epsilon moves to an NFA without epsilon moves and (10)

then to a DFA



Q4. (a) Using pumping lemma prove that the following languages are not regular (10)

(i) $L_1 = \{ ww \mid w \in \{0, 1\}^* \}$

(ii) $L_2 = \{ 0^i 1^i \mid i \geq 1 \}$

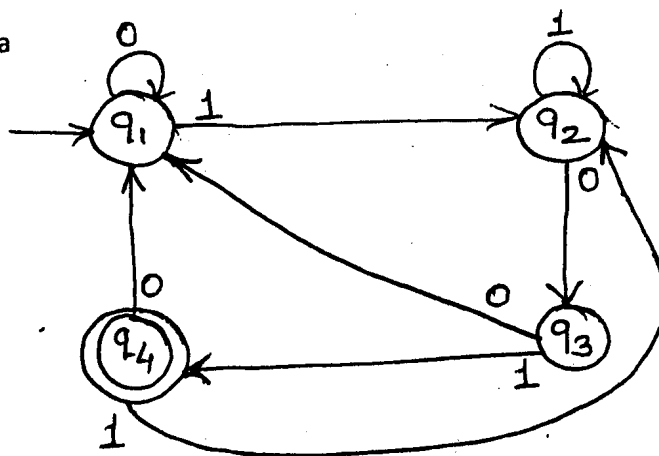
(b) Design a Turing machine to generate the language given by a regular expression (10)

$0(0+1)^*11$

[TURN OVER]

Q5. (a) List and explain decision properties of regular languages. Explain the test for checking emptiness of a regular language (10)

(b) State Arden's theorem and use it to construct a regular expression corresponding to the following automata (10)



Q6 (a) (i) Convert the following CFG to CNF (05)

$$S \rightarrow bA \mid aB$$

$$A \rightarrow bAA \mid aS \mid a$$

$$B \rightarrow aBB \mid bS \mid b$$

(ii) Construct a PDA accepting the following language $L = \{a^n b^m a^n \mid m, n \geq 1\}$ (05)

(b) Explain the rules for simplification of a context free grammar (10)

Q7. Write short notes on (any three) (20)

- Variants of a Turing Machine
- Post Correspondence Problem
- Chomsky Hierarchy
- Intractable Problems
- Recursive and recursively enumerable languages

TE/com/sem V /old

THEORETICAL COM. SCIENCE
(OLD COURSE)

Con. 5640-10.

15/12/10
GT-6936

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.

(2) Solve any **four** questions out of remaining **six** questions.

(3) Assume **suitable** data if **required**.

(4) **Figures** to the **right** indicate **full** marks.

1. (a) Design DFA accepting strings with not more than three a's over $\Sigma = \{a,b\}$ (5)
- (b) Justify the statement "TM acts as language acceptor as well as language generator" (5)
- (c) Give CFG for $L = \{0^m 1^n 0^{m+n} \mid m, n \geq 0\}$ (5)
- (d) State and explain the undecidability of Post Correspondence Problem. (5)
- 2 (a) Convert the given CFG into Chomsky Normal Form (10)
 $S \rightarrow ABAD$
 $A \rightarrow aA \mid \epsilon$
 $B \rightarrow bB \mid \epsilon$
 $D \rightarrow d$
- (b) State and prove pumping lemma for CFL. Prove that $L = \{a^i b^j \mid j=i^2\}$ is not a CFL. (10)
3. (a) Construct PDA for accepting all strings over $\{0,1\}$ with equal number of 0's and 1's. Trace the sequence of transition on input "01110100" (10)
- (b) Construct left linear grammar for the given grammar (5)
 $S \rightarrow abA$ $B \rightarrow aA \mid bb$ $A \rightarrow baB$
- (c) Prove the equivalence of NFA and DFA. (5)
4. (a) Design TM for recognition of binary palindromes. (10)
- (b) Explain the variations of TM and design techniques used in TM construction. (10)

[TURN OVER

5. (a) Giving regular expression , construct NFA and minimum state DFA for the language of strings over $\{0,1\}$ such that the third symbol from the left of any string will be 1. (10)
- (b) Convert the given CFG into GNF (10)
- $$S \rightarrow AA \mid a \qquad A \rightarrow BS \mid b \qquad B \rightarrow SA \mid a$$
6. (a) Compare and contrast Moore and Mealy machine. Design a mealy machine to convert each occurrence of 211 by 212 $\Sigma = \{1,2\}$. (10)
- (b) Design TM to compare two numbers 'm' and 'n' represented in unary format and produces output 'G' for $m > n$, 'L' for $m < n$, 'E' for $m = n$. (10)
7. (a) Distinguish between NPDA and DPDA. (4)
- (b) Design PDA to accept $(aba)^n c^n$ over $\Sigma = \{a,b,c\}$ (6)
- (c) Write short note on (Any two) (10)
- i. UTM
 - ii. Halting Problem
 - iii. Closure properties of regular language
 - iv. Myhill – Nerode's theorem
-

Sem V

Comp/Rev

ADBS T.E/Com/Sem V

ws Oct-10 186

Con. 6095-10.

NOV 2010

(REVISED COURSE)

GT-6712

(3 Hours)

[Total Marks : 100

N.B. :

- 1) Question no.1 is compulsory.
- 2) Attempt any four out of remaining.

1. a) Define data warehousing and data mining. List the applications. 5
- b) Explain concept of Geographical Information System. 5
- c) Compare RDBMS, OODBMS and ORDBMS. 5
- d) Write short note on Query processing in distributed databases. 5
2. a) Describe different architecture for Parallel Database. 10
- b) Explain mobile databases and multimedia databases. 10
3. a) What is DTD ? Give the DTD for an XML representation of the following nested relational schema. 10
 - Emp=(ename, Childrenset setof(children), Skillsetsetof(skill))
 - Children=(name, Birthday)
 - Birthday=(day, month, year)
 - Skills=(type, Examset, setof(exams))
 - Exams=(year, city) .
- b) What is difference between Persistent and Transient objects? How persistence is handled in typical Object - oriented system. 10
4. a) Explain with proper example nested relation in ORDBMS. 10
- b) Write short note on Mobile databases. 10
5. a) Explain data fragmentation, replication and allocation technique for distributed database design 10
- b) Consider the following database for a chain of bookstores.
 Books (Booknum, Primary-author, Topic, Total-stock, Price)
 Bookstore (Storenum, City, State, Zip, Inventory-value)
 Stock (Storenum, Booknum, Qty)
 Indicate a star schema that could be used for building a data warehouse. 10
6. a) Explain with suitable example Aggregation, Specialization and Generalization in EER Diagrams. 10
- b) Explain with suitable example object identity, Object structure and type constructors in case OODBs. 10
7. Write short note on any two. 20
 - a) Transient Object, Subclass and superclass.
 - b) Temporal database
 - c) Web databases.

Con. 5634-10.

(OLD COURSE)

GT-6927

Principles of Digital Communication
(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any four questions out of the remaining six questions.

1. (a) Explain Aliasing error in sampling. 20
(b) Explain PDF and CDF.
(c) Explain Intersymbol Interference.
(d) Compare Energy Signal and Power Signal.
2. (a) What are the disadvantages of DPSK ? Explain in details transmitter and receiver of differentially encoded PSK. 10
(b) Explain offset QPSK Transmitter and receiver. 10
3. (a) For data bit sequence of 10110101, sketch the NSK waveform. Give relevant expressions. 10
(b) Explain Quadrature Amplitude Shift Keying (QASK). 10
4. (a) Explain Noise figure, Noise temperature and live loss. 10
(b) What is matched filter ? Derive its impulse response for maximum output signal to noise ratio. 10
5. (a) Explain the Shannon capacity theorem. Show that channel capacity for channels of infinite bandwidth is $C(\alpha) = \lim_{B \rightarrow \alpha} C = 1.44 \frac{S}{N_0}$. 10
(b) A discrete memoryless source has five symbols x_1, x_2, x_3, x_4 and x_5 with probabilities 0.4, 0.19, 0.16, 0.15 and 0.15 respectively attached to every symbol. Construct a Huffman Code for the source and calculate code efficiency η . 10
6. (a) The parity check matrix of a (7,4) linear block code is :- 12

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$
 - (i) A certain codeword is transmitted which is received as 1110110. Check if any error has occurred at the receiving end.
 - (ii) How would you obtain the correct transmitted codeword if a single error has occurred.
 - (iii) Draw the syndrome decoder for above linear block code.
- (b) Write short notes on :- 8
 - (i) Viterbi Algorithm
 - (ii) Convolution Code.

7. Explain :-

- (a) Entropy and Information Rate
- (b) Image Compression
- (c) Equalization
- (d) Signature Authentication Using Public Key Cryptosystem.

TE/Mech/Etc/ETRX/COM/ETC Sem V

177 : 2nd Half-Exam-10-00 (A).

Environmental Studies

28/12/10

GT-3639

Con. 6493-10.

(REVISED COURSE)

(2 Hours)

[Total Marks : 50

- N.B.** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions from question Nos. 2 to 7.

1. Solve any **five** :— 10
- (a) What is acid rain ? Give two effects of acid rain.
 - (b) Differentiate between Bioprospecting and Biopiracy.
 - (c) Write note on Cyclone Mitigation.
 - (d) Name the fundamental principles of the environment.
 - (e) Distinguish between Nuclear Fission and Nuclear Fussion.
 - (f) Explain the term Sustainable Development.
2. (a) Give an account of Women and Child Welfare in India. 5
(b) Discuss the causes and effect of Global Warming. 5
3. (a) Discuss the effect of Water Pollution. 5
(b) Discuss the role of information technology in environment and human health. 5
4. (a) Short note on public awareness about the environment. 5
(b) Explain Soil Errosion. How it happened give its types. 5
5. (a) What is Noise ? Describe briefly the effect of noise on human health. 5
(b) Write an essay on Disaster Management. 5
6. (a) Give the effect of deforestation. 5
(b) Describe the grassland and forest ecosystem. 5
7. (a) Give the fifteen principles of Environmental Education. 5
(b) Explain the benefits of biological diversity. 5
-