

~~Rev~~ T.E. COMP SEMESTER (F) Dec. 2012

comp. (V) Rev. (CN) Dec-12 1/1

10 : 2nd half.12-shilpa(e)
Con. 9854-12.

KR-5231

(3 Hours)

[Total Marks : 100]

- N.B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume **suitable** data wherever **required**.

C.N.

1. (a) Explain the following with example :- 10
 - (i) Repeater
 - (ii) Hubs
 - (iii) Bridges
 - (iv) Switches
 - (v) Router.
 - (b) Explain the layers details of OSI and TCP/IP Models. 10
 2. (a) Explain the major components of telephone networks. 10
(b) Explain the error detection and error correction algorithms. 10
 3. (a) What is CRC ? Write the algorithm for computing checksum and explain with suitable example. 10
(b) Explain the following with examples :-
MAC address, IP address, Socket, Baud rate, Latency. 10
 4. (a) Differentiate between the following :- 10
 - (i) Protocol and Interface
 - (ii) Connectionless and connection oriented service.
 - (b) Explain and compare the following :-
Ethernet, Token Bus and Token Ring. 10
 5. (a) Explain CSMA/CD. 10
(b) List the features of bluetooth and explain the network formation process. 10
 6. (a) Explain : FDMA, TDMA and CDMA. 10
(b) What are different types of routing ? Explain Distance vector routing. 10
 7. (a) What are the congestion prevention policies ? Explain the congestion control in virtual circuit and datagram subnets. 10
(b) Write note on : SONET. 10
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(3 Hours)

[Total Marks : 100

Ada. classes Mgt. Sys.

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

1. Consider a university database that keeps track of student and their majors, transcripts and registration and the university courses. Several sections of each course are offered and each section is related to the instructor who is teaching. It also keeps track of the sponsored research project of faculty and graduate students of the academic departments of the particular college. The database also keeps track of research grants and contracts awarded to the university. A grant is related to one principle investigator and to all researchers it supports.
 - (a) Draw an extended ER diagram for the above system. 7
 - (b) Show mapping of EER diagram into relational schema. 7
 - (c) Take two typical queries and write them in SQL. 6
2. (a) Explain different architecture for parallel database. 10
(b) Explain different joins such as EQUIJOIN, NATURAL JOIN, LEFT AND RIGHT OUTER JOIN with suitable example. 10
3. (a) Explain query processing in distributed database. 10
(b) Explain with example nested relation in ORDBMS. 10
4. (a) Explain heuristic query optimization with given example :- 10
Select e.lname
from Employee e, Works-on w, Project p
where P.pname = 'Database' And
p.pnumber = w.pno And
e.essn = w.ssn And
e.bdate > '1977-12-31'
(b) In SQL 3 how type inheritance and table inheritance is implemented ? Explain with suitable example. 10
5. (a) What is Data transparency ? Explain the type of transparencies distributed database should achieve. 10
(b) What is well formed and valid XML document ? With example explain what is XML Schema file. 10
6. (a) Explain Nested-loop join and Block Nested-loop join algorithm. 10
(b) Explain database design and implementation process. 10
7. Write short notes on (any four) :- 20
 - (a) Replication in distributed DBMs
 - (b) Aggregate functions in SQL
 - (c) XML Schema elements
 - (d) EXIST and NOT EXIST clause in SQL
 - (e) Query processing in typical DBMs system.

(3 Hours)

[Total Marks : 100]

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

Microprocessor

1. (a) Explain the following Intel 8086 assembly language instructions giving example :— 10
 - (a) TEST
 - (b) DAA
 - (c) STOS
 - (d) SAR
 - (e) JC.
- (b) Explain the interrupt structure of the 8085 microprocessor with a neat diagram. 10
2. (a) Explain addressing modes of 8085 microprocessor with example. 10
(b) Explain assembler directives of 8086. 10
3. (a) Explain the different bus arbitration techniques with their advantages and disadvantages. 10
(b) Write an assembly language program for 8086 to transfer the block of 1 KB located at 0100 H to 02 00H using string instructions. 10
4. (a) Explain the necessity of a bus controller in 8086 maximum mode operation. Also explain the 8288 bus controller in detail. 10
(b) What is segmented memory ? State the advantages of segmented memory with reference to the 8086 microprocessor. 10
5. (a) Explain the concept of DMA. Show and explain an interfacing diagram of the 8086 with the 8237 DMA controller. 10
(b) Explain the operating modes of 8255 PPI. Also, explain the handshaking operation for input and output in mode 1. 10
6. (a) Design an 8086 based system with the following specifications. 10
 - (i) 8086 is in minimum mode
 - (ii) 64 kbyte EPROM using 52 KB devices
 - (iii) 64 kbyte RAM using 32 KB devices.

Draw the complete schematic of the design indicating address map.

(b) Explain the operation of IC 8259 with block diagram. 10
7. Write short notes on any four of the following :— 20
 - (a) RS 232 serial interface standard
 - (b) Difference between memory mapped I/O and I/O mapped I/O
 - (c) IEEE 488 GPIB
 - (d) 8284 clock generator
 - (e) String instructions in 8086
 - (f) Addressing modes of 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.

T.C.S.

(ab)

1. (a) What is finite automation ? Give the finite automation M accepting $(a,b)^*(baaa)$. 5
 (b) Explain Chomsky Hierarchy with languages used, forms of productions in grammars and accepting device. 5
 (c) Differentiate Moore and Mealy machine. 5
 (d) Give and explain ambiguous context free language. 5
2. (a) Design finite state machine to add 2 binary numbers of equal length. 10
 (b) Give the rules for defining languages associated with any regular expression : 10
 Let L_1 = all words beginning with a
 L_2 = all words ending with a
 what is L_1 intersection L_2 ?
3. (a) Give the statement for pumping Lemma for regular languages. 2
 (b) Construct an NFA- Δ for – 8
 (i) $(00 + 1)^*(10)^*$
 (ii) $((0 + 1)^*10 + (00)^*(11)^*)^*$
 (c) Let G be the grammar 10
 $S \rightarrow aB \mid bA$
 $A \rightarrow a \mid aS \mid bAA$
 $B \rightarrow b \mid bS \mid aBB$
 Find the leftmost derivation, right most derivation and parse tree for the string "bbaaabbaaba".
4. (a) What is TM ? Give the power of TM over FSM. Explain undecideability and incompleteness in Turing machine. 10
 (b) Explain PDA and power of PDM. Also design the NPDA for the given – 10
 CFG
 $S \rightarrow aAA$
 $A \rightarrow bS$
 $A \rightarrow aS$
 $S \rightarrow a$

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Question 8 (a) 7/10

Con. 7632-KR-5348-12.

2

- KM
JEC
2012*
5. (a) Explain basic Complexity classes. 6
 (b) Define NP-hard and NP-complete languages. 4
 (c) Using pumping lemma, check whether $a^n b^n$ is regular or not. 10
6. (a) How regular expression is converted to DFA ? Explain all rules with example. 10
 (b) Construct a PDA accepting the language of Palindromes. 10
7. Write short notes on (any four) :- 20
 (a) Myhill Nerode Theorem
 (b) Universal TM
 (c) Rice Theorem
 (d) Closure property and decision algorithm for CFL
 (e) Application areas of RE, FA, PDA, CFG, TM.
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3
Jul
2012

(3 Hours)

[Total Marks : 100]

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

Web Engg.

- (2) Attempt any **four** questions from remaining questions from Q. Nos. 2 to 7.
 (3) **Specify** your answers with examples and diagrams wherever **necessary**.

1. Attempt the following questions :-

20

- (a) List various client side and server side Technologies.
- (b) What do you mean by web browser, what facilities it provides to the user ?
- (c) List various tags in HTML with simple example for a web page.
- (d) What do you mean by internal and external style sheet ?

2. (a) What do you mean by components of generic web application architecture ? 10

Explain in detail.

(b) Explain 2 Tier and 3 Tier Architecture for web application. 10

3. (a) Write short note on (i) content modelling (ii) access modeling. 10

(b) Write a code in any web development tool to represent ordered and unorderded list, form, tables and images for a web page.

4. (a) You are appointed as Team Leader for a web based application for *online admission process* of first year Engineering, find all the stake holder for this and give a simple format of application form that will be displayed on screen (do not write any code). 15

(b) Explain all attributes for Tables in HTML. 5

5. (a) What is XML, XSL, DTD ? Explain with simple example. 10

(b) Explain in detail characteristics of web applications. 10

6. (a) Differentiate between Get and Post method for a web based application, 10 write a simple code to explain the same.

(b) Explain in brief Requirement Engineering activities. 10

7. (a) Explain role of tester in testing web application. 10

(b) What do you mean by content management system. 10

T.E. - All Branch - SEM - II (REV.)

2012

TE sem - II (R) /

Subj: EVS

01/02

ws-Con-2012

Con. 7666-12.

SUB - EVS.

KR-5585

(2 Hours)

[Total Marks : 50]

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

Q.1] Answer **Any Five** of the following: (10)

- (a) What is Ecological Succession?
- (b) What are the adverse effects of Acid rain?
- (c) What is 'Biological prospecting'?
- (d) What are the reasons of Thermal pollution?
- (e) What are the powers of forest officer?
- (f) Explain the terms: Bio-order and Material Order
- (g) Explain importance of value education.

Q.2] (a) Explain the role played by Information Technology to the field of Environment and Human Health. (5)

(b) Explain sources and effects of soil pollution. (5)

Q.3] (a) Explain briefly the salient features of Forest Conservation Act. (5)

(b) Why HIV-Aids is so widespread? What are its effects on human health and environment? (5)

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T. E. Sem-II(R)

Sub.: EVS

02/02

ws-Con-2012

Con. 7666-KR-5585-12.

2

Q. 4] (a) What steps taken for conservation of biodiversity ? (5)

(b) Explain urban problems pertaining to Energy. (5)

Q.5](a) Describe Grassland Ecosystem. What will happen if grassland ecosystem disappear? What measures can be taken for its conservation? (5)

(b) Explain which remedial steps are taken in mitigation earthquakes? (5)

Q.6] (a) What problems faced by women and children? What is being done for their welfare? (5)

(b) What is solid waste? Describe various methods of solid waste management? (5)

Q.7] (a) What are land resources? What are the reasons for degradation of land? (5)

(b) What is Population Explosion? Describe the effects of population on Environment. (5)

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T.E. ELEC, Electro, COMP., Instru, IT, EXTC.

T.E. Sem-II (OTR), Pasty I/Ex

Subj: App. Maths-II

D Scan Pra 1 69

Con. 11026-12.

KR-8889

(3 Hours)

[Total Marks : 100]

26
KEKOK

24

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

1. (a) A random variable X has the distribution—

X	0	1	2	3	4	5	6
p(X)	K	3K	5K	7K	9K	11K	13K

Find – (i) K (ii) $P\{x < 4\}$ (iii) $P\{3 < x \leq 6\}$.

- (b) A box contains 100 transistors, out of which 20 are defective. If 10 are selected for inspection, find the probability that—
(i) atleast one is defective
(ii) atmost 3 are defectives.
(c) Using pigeon hole principle show that if thirteen people are assembled in a room, at least two of them must have their birthday in the same month.
(d) If aRb if and only if $a \equiv b \pmod{5}$, $a, b \in \mathbb{Z}$ Show that R is an equivalence relation where \mathbb{Z} is the set of integers.

2. (a) If $f(x) = \begin{cases} 2e^{-2x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$ is a pdf of a random variable. Find First four moments about origin. 6
(b) Samples of two types of electric bulbs were tested for length of life and following result were obtained. 6

Type X : $n_1 = 8$, $\bar{x}_1 = 1234$ hrs, $s_1 = 36$ hrs

Type Y : $n_2 = 7$, $\bar{x}_2 = 1036$ hrs, $s_2 = 40$ hrs

Is type X is better than type Y. Test at 5% level of significance.

- (c) Find the equation of lines of regression of (i) y on x and (ii) x on y. 8

x	5	6	7	8	9	10	11
y	11	14	14	15	12	17	16

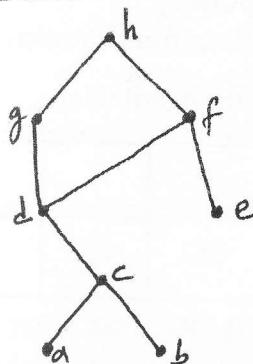
3. (a) Suppose X follows, Poisson distribution with parameter λ and $P\{X=2\} = \frac{1}{2} P\{X=1\}$. Find $P\{X=3\}$. 6
(b) If $f: \mathbb{R} \rightarrow \mathbb{R}$, $g: \mathbb{R} \rightarrow \mathbb{R}$ are defined as $f(x) = 2x + 1$ and $g(y) = y^2 + 2$. Find $fog(-2)$, $gof(-2)$, $fog(x)$, $gof(x)$, $fog(x)$, $gog(x)$. 6

[TURN OVER]

Con. 11026-KR-8889-12.

2

- (c) Find the lub and glb of every pair of elements of the given poset if exist. Is it a Lattice? 8



4. (a) The marks of 1000 students of an Engineering college are distributed normally with mean 70 and standard deviation 5. Estimate the number of students whose marks will be (i) between 60 and 75 (ii) more than 75. 6

- (b) Obtain the rank correlation coefficient from the given data :— 6

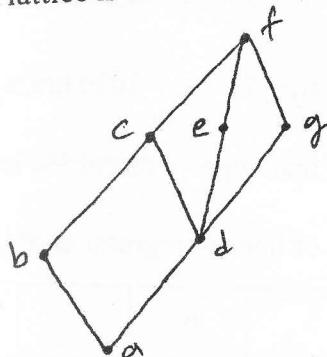
x	10	12	18	18	15	40	18
y	12	18	25	25	30	25	15

- (c) Four coins are tossed and the number of heads is noted. The experiment is repeated 100 times and the following distribution is obtained. 8

No. of heads	0	1	2	3	4
Frequency	7	18	40	31	4

Does this result support that all four coins are unbiased? Test at 5% level of significance.

5. (a) Determine whether given lattice is distributive, complemented or both. 6



- (b) An insurance agent has claimed that the average age of his policy holders is less than the average age of all agents which is 30.5 yrs. A random sample of 100 policy holders who had insured through him gave the distribution :— 6

Age of insurer	21–25	26–30	31–35	36–40
No. of insurers	32	22	30	16

Test his claim at 2% significance level.

- (c) If $f : \mathbb{R} \rightarrow \mathbb{R}$, $g : \mathbb{R} \rightarrow \mathbb{R}$ are defined as —

8

$$f(x) = 3x - 5, \quad g(x) = \frac{x+2}{3}.$$

Show that f^{-1} , g^{-1} , $(g \circ f)^{-1}$ exist.

Verify that $(g \circ f)^{-1} = f^{-1} \circ g^{-1}$

6. (a) Show that $(\mathbb{Z}_5, +_5, X_5)$ is a ring. Is it a field ?
- (b) The manager of a chain of restaurants wants to know whether the customer satisfaction is related to the waiter. He take a random sample of 100 customers, asking the name of the waiter and the service quality. He then categories the salaries of the waiters. His results are shown below. Test whether the quality of service is independent of the waiter's salary. Apply 5% I.S.

6

6

		Salary	
		Low	High
Service	Good	28	24
	Poor	19	29

- (c) Fit a least square parabola of y on x .

8

x	1.2	1.8	3.1	4.9	5.7	7.7	8.6	9.8
y	4.5	5.9	7.0	7.8	7.2	6.8	4.5	2.7

7. (a) If $\mathbb{R}/\{0\}$ is the set of real numbers other than zero and binary operation is defined as $a * b = 2^{a/b}$; $a, b \in \mathbb{R}/\{0\}$. Prove that $(\mathbb{R}/\{0\}, *)$ is an abelian group. 6
- (b) Determine all maximal, minimal, the greatest and the least elements of the poset if exist. 6
- $A = \{2, 3, 4, 6, 8, 12, 18, 36, 72\}$ with the usual partial order of divisibility.
- (c) Ten school boys were given a test in mathematics. They were given a month special coaching and a second test was given to them in the same subject. 8

Marks in Test I	70	68	55	75	80	90	68	75	56	58
Marks in Test II	68	70	52	74	75	78	80	92	54	55

Test if the marks given above give evidence that the student are benefitted by coaching. Use 5% level of significance.