[3918] – 102

S.Y.B.Sc. (Computer Science) (Semester – I) Examination, 2011
(New 2008 Pattern) (Paper – II)
CS - 212 : RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

Time : 2 Hours Max. Marks : 40

N.B. : *i)* ***All*** *questions are* ***compulsory****.*
ii) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Attempt **all** of the following : **(1×10=10)**

a) Write any two aggregate functions in MySQL with example.

b) Define Time-stamp.

c) What is lost update problem ?

d) What is Thin-client ?

e) What is system log ?

f) Define foreign key.

g) What is the output of the following ?

```
Select  FLOOR (6.5) ;
```

h) State any two variations of 2PL protocol.

i) What is database security ?

j) What is Discretionary Access Control ?

2. Attempt **any two** of the following : **(2×5=10)**

a) What is view ? Explain how to create view with suitable example.

b) What is serializability ? Explain conflict serializability.

c) Explain with suitable example types of schedules based on recoverability.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

a) How mandatory access control methods classified data and user, based on security classes ? Explain with suitable example.

b) The log corresponding to a particular schedule for three transactions T_1, T_2, T_3 is as follows.

[Start-transaction, T_1]

[Read-item, T_1, D]

[Write-Item, T_1, D, 20]

[Commit, T_1]

[Check point]

[Start-transaction, T_2]

[Read-item, T_2, B]

[Write-item, T_2, B, 12]

[Start-transaction, T_3]

[Write-item, T_3, A, 20]

[Read-item, T_2, D]

[Write-item, T_2, D, 25] $\leftarrow$ system crash

if deferred update with check point is used. What will be the recovery procedure ?

c) Consider following tables.

Teacher (t-no, t-name, college-name, dept)

E-test(e-no, test-name)

Teacher and E-test are related with many-to-many relationship.

Solve following queries.

i) Count number of teachers who passed SET exam of computer science.

ii) List exam wise list of teachers who have passed the respective exam.

4. Attempt the following : **(2×5=10)**

a) Write a note on Thomos write rule and Phantom Phenomenon.

b) Explain in detail client-server interactions.

OR

b) The following is the list representing the sequence of events in an interleaved execution of set of transactions T_1, T_2, T_3, T_4 with two phase locking protocol.

Time	**Transaction**	**Code**
t_1	T_1	LOCK (B, X)
t_2	T_2	LOCK (A, X)
t_3	T_3	LOCK (C, S)
t_4	T_4	LOCK (B, X)
t_5	T_1	DISP (A – C)
t_6	T_2	LOCK (C, X)
t_7	T_3	LOCK (A, X)
t_8	T_4	LOCK (C, S)

Is there a deadlock ? If yes which transaction are involved in dead lock ?

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[3918] – 204

S.Y. B.Sc. (Computer Science) (Semester – II) Examination, 2011
MATHEMATICS (Paper – II)
MTC-222 : Operations Research
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

N.B. : *i)* ***All*** *questions are* ***compulsory****.*
ii) Figures to the ***right*** *indicate* ***full*** *marks.*
iii) ***Use*** *of single memory, non-programmable scientific calculator is* ***allowed****.*
iv) Graph papers will be supplied on ***demand****.*

1. Attempt the following : **10**

i) Define slack and surplus variables.

ii) What is redundant constraint ?

iii) Write the dual of the following Linear programming problem.

Minimize $(z) = 8x_1 + 16x_2$

Subject to - $3x_1 + 2x_2 \geq 18$

$x_1 + 3x_2 = 6$

$2x_1 - x_2 \geq 4$

and $x_1, x_2 \geq 0.$

iv) How do you convert the maximization assignment problem into minimization ?

v) What is an unbalanced assignment problem ? Explain how to balance it.

vi) What is meant by degeneracy in transportation problem ?

vii) Write standard form of the following Linear programming problem.

Maximize $(z) = -2x_1 - x_2 + x_3$

Subject to - $x_1 - x_2 + x_2 \leq 3$

$2x_1 - x_2 + x_3 = 2$

$-x_1 + 2x_2 + 3x_3 \geq 1$

and $x_1, x_2, x_3 \geq 0.$

P.T.O.

viii) Justify whether the following statement is **true** or **false** :
'Every two person zero-sum game can be solved by simplex method'.

ix) Solve the following assignment problem for minimization.

	I	II
A	2	2
B	2	2
C	2	1

x) Find the optimal objective value of the following problem by observing the dual of the problem (Do not solve the dual)

Minimize (z) = $5x_1 + 2x_2$

Subject to - $3x_1 + 2x_2 \geq 30$

and $x_1, x_2 \geq 0$.

2. Attempt **any two** of the following : **10**

i) A company produces two types of presentation goods A and B that require gold and silver. Each unit of type A requires 3 gm of silver and 1 gm of gold while B requires 1 gm of silver and 2 gm of gold. The company can produce 9 gm of silver and 8 gm of gold. If each unit of type A brings a profit of Rs. 40 and that of type B Rs. 50, determine the number of units of each type that should be produced to maximize the profit.

ii) Solve the following Linear programming problem by simplex method.

Maximize (z) = $x_1 + 2x_2$

Subject to - $-x_1 + 3x_2 \leq 10$

$x_1 + x_2 \leq 6$

$x_1 - x_2 \leq 2$

and $x_1, x_2 \geq 0$.

iii) Solve the following assignment problem to minimize the total cost

	a	b	c	d
A	4	7	5	6
B	∞	8	7	4
C	3	∞	5	3
D	6	6	4	2

3. Attempt **any two** of the following : **10**

i) Solve the following 4 × 2 game by graphically.

		Player – B	
		I	II
Player – A	I	1	6
	II	8	5
	III	5	4
	IV	10	3

ii) Find IBFS of the following transportation problem by VAM method.

To → / From ↓	W_1	W_2	W_3	W_4	Supply
F_1	30	25	40	20	100
F_2	29	26	35	40	250
F_3	31	33	37	30	150
Demand	90	160	200	50	

iii) Write the mathematical formulation of assignment problem.

4. Attempt **any one** of the following : **10**

i) a) Reduce the following game by the dominance principal and find optimal solution

		Player – B		
		B_1	B_2	B_3
Player – A	A_1	12	10	4
	A_2	7	5	2
	A_3	9	7	8

b) Solve the following Linear programming problem by graphical method.

Maximize (z) = $5000x_1 + 4000x_2$

Subject to - $6x_1 + 4x_2 \leq 24$

$x_1 + 2x_2 \leq 6$

$-x_1 + x_2 \leq 1$

$x_2 \leq 2$

and $x_1, x_2 \geq 0$.

ii) Find the initial basic feasible solution by North-West corner method. Obtain its optimal solution by MODI method for the following transportation problem.

Destination → / Origin ↓	D_1	D_2	D_3	D_4	**Supply**
O_1	10	2	20	11	15
O_2	12	7	9	20	25
O_3	4	14	16	18	10
Demand	5	15	15	15	

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[3918] – 301

T.Y.B.Sc. (Computer Science) (Semester – III) Examination, 2011
(Paper – I)
CS-331 : SYSTEMS PROGRAMMING AND OPERATING SYSTEM – I
(2008 Pattern) (New Syllabus)

Time : 2 Hours Max. Marks : 40

Instructions : *1)* ***Neat*** *diagrams must be drawn* ***wherever*** *necessary.*
2) Black figures to the ***right*** *indicate* ***full*** *marks.*
3) ***All*** *questions carry* ***equal*** *marks.*
4) Assume ***suitable*** *data,* ***if necessary****.*
5) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** : **(10×1=10)**

a) Write two differences between system programming and application programming.

b) Write any two types of editors.

c) Give syntax of assembly language instruction.

d) What is forward reference ?

e) Define macro assembler.

f) What is basic block ?

g) What is dead code ?

h) What is display ?

i) What is impure interpreter ?

j) Define program relocation.

2. Attempt **any two** : **(2×5=10)**

a) Explain design of two-pass assembler.

b) Explain code optimization in detail.

c) What is program relocatability ?

P.T.O.

3. Attempt **any two** : **(2×5=10)**

   a) Give features and advantages of using assembly language.

   b) Explain syntax and semantic analysis phases of compiler.

   c) Explain linking for overlays.

4. Attempt either **A** or **B** : **10**

   A) a) Show indirect triples' representation for the program segment :

   $z := a + b * c + d * e \uparrow f$;

   $y := x + b * c$; **5**

   b) Give syntax of advanced assembler directives. **3**

   c) What do you mean by public definition and external references ? **2**

   OR

   B) a) Explain advanced macro facilities with the help of suitable example. **5**

   b) Explain in brief, two models for dynamic memory allocation in block structured programming languages. **3**

   c) What do you mean by P-code compiler ? **2**

[3918] – 304

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
(2008 Pattern)
Paper – IV : COMPUTER SCIENCE
CS-334 : Web Development and Php Programming – I

Time : 2 Hours Max. Marks : 40

Instructions : *1)* ***Neat*** *diagrams must be drawn* ***wherever*** *necessary.*
2) Black figures to the ***right*** *indicate* ***full*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** of the following : **(10×1=10)**

a) What is web browser ?

b) Find the output.

```
<?Php
    sa = "1E3 points of light" +1;
    echo "sa" ;
?>
```

c) Write anonymous function to find minimum of two integer numbers.

d) How to define multiline string in Php ?

e) State the purpose of shuffle ( ) function.

f) How to create object in Php ?

g) What is interface ?

h) How to delete file in Php ?

i) What is SSL ?

j) How we can get the cookie values and destroy the cookies ?

2. Attempt **any two** of the following : **(2×5=10)**

a) Explain with diagrammatic representation the execution of Php script.

b) How to built character classes ? Explain with suitable example.

c) What is form validation ? Explain with suitable example.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Write a Php script to accept a string and check whether string is palindrome or not using stack and queue based builtin functions.

   b) Explain constructors and destructor with suitable example.

   c) Write Php script to read a flat file student.dat and display the data from file in tabular format.

4. Attempt **any one** (**A** or **B**) : **10**

   A) i) Write Php script to create user define function xstrstr (string1 string 2). (Accept string from user) and illustrate it.

   ii) Write a Php script which will give details about all declared classes, their properties, methods within a program using nested for each loop.

   B) i) Write Php script to select list of subjects (use multivalued parameter) display on the next page.

   ii) Explain in detail the concept of cookies and session.

[3918] – 401

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE (Paper – I)
CS-341 : Systems Programming and Operating Systems – II
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions : *1)* ***Neat*** *diagrams must be drawn* ***wherever*** *necessary.*
2) ***All*** *questions carry* ***equal*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** of the following. **(1×10=10)**
   a) Give any two benefits of Linux operating system.
   b) List any two shells of Linux operating system.
   c) What do you mean by context switch ?
   d) What is difference between process based model and thread based model ?
   e) Give any four criteria for computing various scheduling algorithms.
   f) What is semaphore ?
   g) Define request edge and claim edge.
   h) What is the advantages of paging with segmentation model ?
   i) What is practical problem for implementing optimal replacement ?
   j) What is file ? List any two attributes of file.

2. Attempt **any two** of the following : **(5×2=10)**
   a) Consider the following snapshot of a system.

Process	Burst time	Arrival time
P_1	5	1
P_2	3	0
P_3	2	2
P_4	4	3
P_5	2	13

   Compute the average turn around time and average waiting time using
   i) SJF (Non-preemptive)
   ii) Round Robin (Time quantum = 2).

P.T.O.

b) What is system call ? Explain any four types of system call.

c) What is scheduler ? Explain any two types of scheduler.

3. Attempt **any two** of the following : **(5×2=10)**

a) Differentiate between internal and external fragmentation. Does paging suffer from external fragmentation ? Comment and justify.

b) Consider the following snapshot of a system. A, B, C, D are the resource type and P_0, P_1, P_2, P_3, P_4 are the processes.

	Allocation				**Max**			
	A	B	C	D	A	B	C	D
P_0	0	6	3	2	0	6	5	2
P_1	0	0	1	2	0	0	1	2
P_2	1	0	0	0	1	7	5	0
P_3	1	3	5	4	2	3	5	6
P_4	0	0	1	4	0	6	5	6

Available

A	B	C	D
1	5	2	0

Answer the following questions using Banker's Algorithm.

i) What are the contents of need array ?

ii) If the system is in safe state give the safe sequence.

c) Explain in detail multilevel queues and multilevel feedback queues.

4. A) Attempt **any one** of the following (**A** or **B**) : **(1×10=10)**

a) What is critical section problem ? Explain the following term in the context of it. **5**

i) mutual exclusion

ii) progress

iii) bounded wait.

b) What are the benefits of multithreading programming ? Explain any one multithreading model. **3**

c) Write a short note on acyclic graph directory. **2**

B) a) For the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3 0, 3, 2, 1, 2, 0, 7, 0, 1. How many page fault occur for the following page replacement algorithms, assuming three frames. All frames are initially empty.

i) LRU ii) Optimal replacement **5**

b) Explain the term "Rollback and select a victim" in the context of deadlock recovery. **3**

c) Explain multiprocessor system. **2**

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[3918] – 702

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
(Paper – II) (2004 Pattern)
CS : 332 : THEORETICAL COMPUTER SCIENCE AND COMPILER CONSTRUCTION – I

Time : 2 Hours | Max. Marks : 40

Instructions : *1) Black figures to the **right** indicate **full** marks.*
*2) **All** questions carry **equal** marks.*
*3) **All** questions are **compulsory**.*

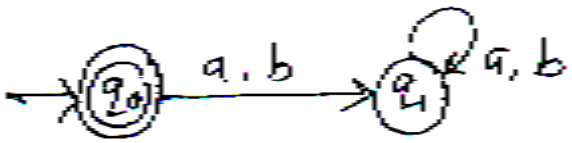
1. Attempt the following : **(10×1=10)**

a) Define set. What is 'Cardinality' of set ?

b) Write power set of Q = $\{q_0, q_1, q_2\}$.

c) DFA may have multiple final states. State True or False.

d) Express language accepted by given F.A.



e) What are the applications of F.A. ?

f) Define Handle.

g) What is the difference between PDA and FA ?

h) CFL are closed under intersection. State True or False.

i) Write smallest possible string accepted by given RE (0 + 1*) 01*.

j) Write mapping of 'δ' function of NFA with $\in$ moves.

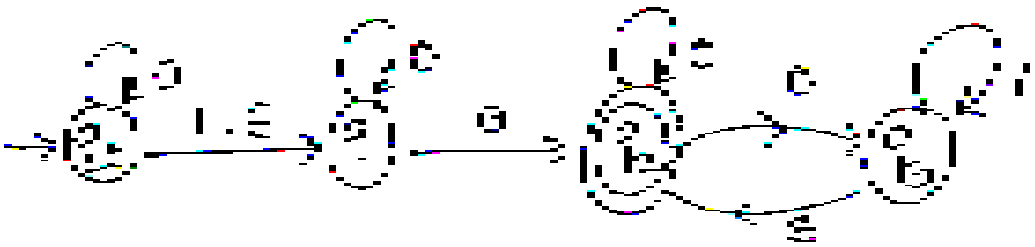
P.T.O.

2. Attempt **any two** : **(2×5=10)**

   a) Construct DFA to over $\sum = \{0,1\}$ which accepts string with substring '001' and not having substring '011'.

   b) Design a Moore machine to read string over {0, 1} and produces output 'A' for each occurrence of substring '101', produces output 'B' for each occurrences of substring '110', otherwise produces output 'C'.

   c) Construct DFA equivalent to given NFA



3. Attempt **any two** : **(2×5=10)**

   a) Construct CFG for a language L, where L = $\{a^i b^j c^k / i = j \text{ or } j \leq k\}$.

   b) Construct PDA for a language L, where L = $\{a^n b^{n+m} c^m / m, n \geq 0\}$.

   c) Convert grammar into GNF

   $S \rightarrow a \mid AA \mid BA$

   $A \rightarrow a \mid AB \mid b$

   $B \rightarrow a.$

4. Attempt **any two** : **(2×5=10)**

   a) Construct PDA for following CFG :

   $S \rightarrow aAb \mid aS$

   $A \rightarrow Bb \mid a$

   $B \rightarrow Sa \mid b$

b) Convert grammar into CNF

$S \rightarrow A \mid B \mid C$

$A \rightarrow aAa \mid B$

$B \rightarrow bB \mid bb$

$C \rightarrow aCaa \mid D$

$D \rightarrow baD \mid abD \mid aa$

c) Find minimal DFA for the following :

	a	**b**
$\rightarrow$ **q_1**	q_2	q_3
q_2	q_3	q_5
q_3	q_4	q_3
q_4	q_3	q_5
(**q_5**)	q_2	q_5

[3918] – 703

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
CS-333 : COMPUTER NETWORKS AND NETWORK ADMINISTRATION – I
(Paper – III) (2004 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions : *1) Black figures to the **right** indicate **full** marks.*
*2) **All** questions carry **equal** marks.*
*3) **All** questions are **compulsory**.*

1. Attempt the following : **10**

   a) What is Interface and SAP ?

   b) List out channel allocation strategies.

   c) Define unreliable datagram services.

   d) Define Flow Control.

   e) Explain Manchester and differential Manchester encoding scheme.

   f) Define Multiplexing.

   g) Explain piggybacking method.

   h) Define utopia.

   i) Define piconet and scatternet.

   j) Define FDMA.

2. Attempt **any two** of the following : **(2×5=10)**

   a) What is networking ? What are the goals of computer networks ?

   b) Describe the services provided by ISDN.

   c) Define framing. Explain the methods of Framing.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Describe different design Issues for the layers.

   b) Explain the services provided by data link layer and session layer.

   c) Describe one bit sliding window protocol.

4. Attempt **any one** of the following : **(1×10=10)**

   I) a) Compare between ISO-OSI and TCP/IP model.

      b) Suppose the given message is 1011011110 and the generator is $x^3 + x + 1$ is there a any error in data. Find the transmitted frame.

   OR

   II) a) Write a note on aloha.

      b) Describe traditional Ethernet.

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[3918] – 802

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE (Paper – II)
CS-342 : Theoretical Computer Science and Compiler Construction – II
(2004 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions : *1) Black figures to* ***right*** *indicate* ***full*** *marks.*
2) ***All*** *questions carry* ***equal*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt the following : **(1×10=10)**

   a) Differentiate between TM and FA.

   b) Define translator.

   c) Let L be CFL generated by Grammar G = {V, T, P, S} write the tuples for kleen closure of language L.

   d) Lex is scanner provided by Linux O.S. Justify True or False.

   e) Define Operator Grammar.

   f) Which type of conflict is not possible in LR parser ?

   g) Give snapshot of TM and obtain instantaneous description.

   h) Draw transition diagram for recognizing hexadecimal no. in C language.

   i) Give format of YACC program.

   j) TM has only one final state. Justify True or False.

2. Attempt **any two** : **(2×5=10)**

   a) Check whether given grammar is LL1) or NOT

$$S \longrightarrow ScB/cA$$
$$A \longrightarrow AaB/B$$
$$B \longrightarrow bB/\in$$

P.T.O.

b) Construct T.M. for a language L, where $L = \{WcW / w \in (a+b)^*\}$.

c) Chick whether given CFG is LR1) or NOT

$S \longrightarrow 0P3 / 1Q3 / 0Q4 / 1P4$

$P \longrightarrow 2$

$Q \longrightarrow 2$

3. Attempt **any two** : **(2×5=10)**

a) Check whether grammar is SLR(1) or not

$S \longrightarrow P$

$P \longrightarrow bRAe$

$A \longrightarrow AmE / E$

$R \longrightarrow Rdm / \in$

$E \longrightarrow P / q$

b) Find first and follow for the following CFG

$S \longrightarrow aABbCD / \in$

$A \longrightarrow Amd / \in$

$B \longrightarrow SAm / hn / \in$

$C \longrightarrow Sf / Cg$

$D \longrightarrow aBD / \in$

c) Construct shift-reduce parser for the CFG

$S \longrightarrow aAd / aSd$

$A \longrightarrow bAcc / bcccc$

string : a′abbccccccdd′

4. Attempt **any two** : **(2×5=10)**

a) Check whether following grammar is operator precidence parser or NOT (draw precedence relation Table)

$S \longrightarrow S + P \mid P$

$P \longrightarrow P * Q \mid Q$

$Q \longrightarrow (S) \mid q$

b) Check whether grammar is LALR or NOT

$S \longrightarrow P_0 \mid {}_1P_2 \mid Q_0 \mid {}_1Q_2$

$P \longrightarrow 3$

$Q \longrightarrow 2$

c) Explain various code optimization techniques.

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[3918] – 805

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE
CS-345 : Programming in Advanced Java – II
(2004 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions *: 1)* ***All*** *questions carry equal marks.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** of the following : **(10×1=10)**

   a) The method yield( ) can work only with same priority thread ? State true or false with justification.

   b) What is thread ? How we start the thread ?

   c) State any four collection interfaces.

   d) State two methods of enumeration interface.

   e) When to use execute Update( ) ?

   f) State the difference between statement and prepared statement interface.

   g) Which method is used to send a cookie to the client from servlet ?

   h) State the difference between doGet and doPost methods.

   i) State the use of object output stream class.

   j) Write any two classes of java.rmi.$*$ package.

2. Attempt **any two** : **(2×5=10)**

   a) Explain RMI architecture.

   b) What is servlet ? State types of servlet. Also describe the relationship between JSP and servlet.

   c) Write short note on object serialization and deserialization. Give proper example.

P.T.O.

3. Attempt **any two** : **(2×5=10)**

   a) Write a menudriven program to search and update the values in telephone table which contains (telephone no., name of customer, address, bill). Assume the database is in postgres.

   b) Write a program that uses the Hashtable class for storing and retrieving employee records.

   c) Explain the meaning of priority of the thread with simple example.

4. Attempt **any two** : **(2×5=10)**

   a) Write a servlet program which display the current date and time.

   b) Write a jdbc program for student database contains (Roll, name, phone). Display the number of columns and column name.

   c) Write a short note on JAR files.

[3918] – 103

S.Y. B.Sc. (Comp. Sc.) (Semester – I) Examination, 2011
MATHEMATICS (Paper – I) (2008 Pattern)
MTC – 211 : Linear Algebra (New)

Time : 2 Hours Max. Marks : 40

***Instructions**: 1) **All** questions are **compulsory**.*
*2) **All** questions carry **equal** marks.*

1. Attempt **all** questions : **10**

i) Determine the value of "a" for which the following system has infinitely many solutions.

$(a - 3)\, x + y = 0$

$x + (a - 3)\, y = 0$

ii) If $T : R^2 \to R^2$ is a linear transformation defined by $T(x, y) = (x, x + y - 1)$ find Kernel T.

iii) Find the eigen values of $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$.

iv) State true or false : If A is 4×3 matrix and B is 3×4 matrix, then A + B is defined.

v) Let $V = M_{2\times2}$ be the vector space of all 2×2 matrices with real entries. Write standard basis for V.

vi) If $T : R^2 \to R^2$ is a linear transformation defined by $T(x, y) = (x, x - y)$ then find the standard matrix of T.

vii) Determine whether the subset $W = \left\{ \begin{bmatrix} a & b \\ c & d \end{bmatrix} \middle| b = 0, c = 1 \right\}$ is a subspace of the vector space $V = M_{2\times2}(\mathbb{R})$.

P.T.O.

viii) Give an example of a matrix which is in reduced row echelon form.

ix) Determine whether the subset S = {(1,2), (–3,5), (7,4)} is linearly independent in R^2. Why ?

x) Is $A = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ an orthogonal matrix ?

2. Attempt **any two** of the followings : **10**

i) If W_1 & W_2 are subspaces of a vector space V. Then prove that $W_1 \cap W_2$ is a subspace of V.

ii) Find the basis for the subspace spanned by the vectors (1, 3, 1, –2), (1, 4, 3, –1), (2, 3, –4, –7), (3, 8, 1, –7).

iii) Show that the set of vectors B = {(1,0,0), (1,1,0), (1,1,1)} forms basis for R^3, hence find the co-ordinates of the vector (2, –3, 5) relative to basis B.

3. Attempt **any two** of the followings : **10**

i) If $T : V \to W$ is a linear transformation then prove that, Ker (T) = {0} if and only if T is one-one.

ii) Verify Cayley-Hamilton theorem for the following matrix $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 1 \\ 0 & 0 & 3 \end{bmatrix}$

iii) Find a basis and dimension of null space of the matrix $A = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 2 & 0 \\ 0 & 1 & 1 \end{bmatrix}$ hence find the rank of A.

4. Attempt **any one** of the followings : **10**

i) a) Determine whether the matrix $A = \begin{bmatrix} 10 & -9 \\ 4 & -2 \end{bmatrix}$ is diagonalizable. Justify.

b) Let V be a vector space, $\bar{u}$ be a vector in V and K be any scalar. Then prove that $K\bar{u} = \bar{0}$ if and only if either K = 0 or $\bar{u} = \bar{0}$.

ii) Find LU-Factorization of the matrix $A = \begin{bmatrix} 1 & 3 & -4 \\ 2 & 5 & -9 \\ 3 & -2 & 3 \end{bmatrix}$ and use it to solve

the system of linear equations

$x + 2y - 4z = -4$

$2x + 5y - 9z = -10$

$3x - 2y + 3z = 11$

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S.Y. B.Sc. (Comp. Sci.) (Semester – I) Examination, 2011
Electronics (Paper – II)
ELC-212 : COMMUNICATIONS PRINCIPLES
(New Course) (2008 Pattern)

Time : 2 Hours Max. Marks : 40

***Instructions** : 1) **All** questions are **compulsory**.*
*2) **Neat** diagrams must be drawn **whenever** necessary.*

1. Answer the following in **one** or **two** sentences : **(1×10=10)**

   a) Define signal bandwidth. Give the bandwidth of voice signal.

   b) State any two functions of network switching sub-system.

   c) Define bit padding.

   d) The modulating signal 3 sin 3000 t is used to modulate carrier signal of 5 sin 20,000 t in AM system. Calculate modulating index.

   e) State any two application of RFID.

   f) Comment – It is easier to increase the capacity of channel by expanding its bandwidth than increasing the average transmitted power.

   g) What is need of multiple access technique in communication ?

   h) What is frequency reuse in mobile communication ?

   i) Draw the waveform of 00K for data 11001010.

   j) Draw the radiation pattern of folded dipole.

2. Answer following questions (**any two**) : **(5×2=10)**

   a) Draw block diagram of electronic communication system. Enlist any three communication media along with their bandwidth.

   b) Explain QPSK modulator with a help of suitable block diagram.

   c) Explain general architecture of GPRS with the help of neat diagram.

P.T.O.

3. Answer following questions **(any two)** : **(5×2=10)**

   a) Distinguish between FDM and TDM system.

   b) Calculate maximum bit rate for noise free bandwidth of 2000 KHz. Calculate number of signal levels needed to achieve maximum capacity in presence of noise with S/N ratio equal to 15 dB.

   c) Define antenna. What is role of antenna in electronic communication ? Explain omnidirectional antenna.

4. Answer following question **(any one)** : **(10×1=10)**

   A) i) Draw block diagram of PCM transmitter and explain steps involved in pulse code modulation technique.

      ii) Explain the handovers in GSM.

   B) i) Explain any three features of FDMA. Consider a mobile operator is allotted 15 MHz for each simplex band and if it has B_{guard} of 5 KHz and B_C = 25 KHz. Find number of channels available in FDMA system. **5**

      ii) Why digital signal cannot be send on telephone lines ? State basic types of continuous wave digital modulation technique. **2**

      iii) Define following parameters of antenna :
         a) Directive gain
         b) Beam width
         c) Radiation pattern. **3**

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S.Y. B.Sc. (Comp. Sci.) (Semester – I) Examination, 2011
ELC-212 : ELECTRONICS – II
Process Control Instrumentation (Old) (2004 Pattern)

Time : 2 Hours Max. Marks : 40

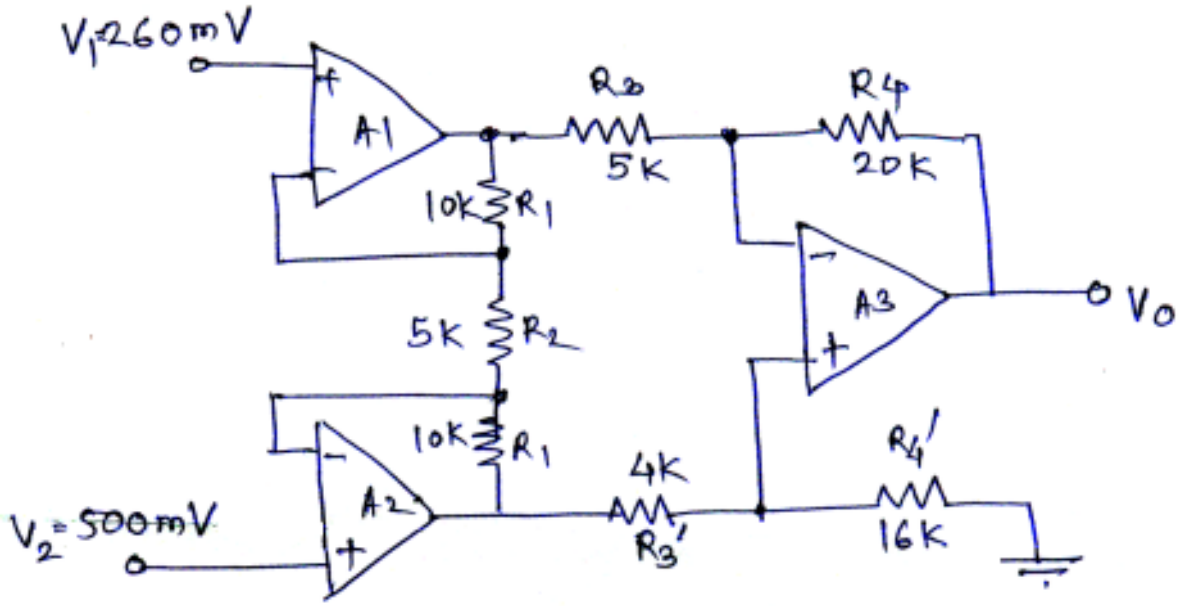
Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) ***Neat*** *diagrams are to drawn* ***whenever*** *necessary.*

1. Answer the following questions in **one-two** sentences : **(1 each)**
   a) Enlist any two elements required to assemble a control system.
   b) State atleast two reasons, why platinum is used in RTD.
   c) Comment – In S/H, buffers are used at input and output.
   d) Define dead time.
   e) State any two possible analysis using PSPICE.
   f) State any two optical detectors.
   g) Define droop rate in S/H.
   h) Comment – Derivative mode is never used alone.
   i) State working principle of LVDT.
   j) What is neutral zone in ON-OFF Controller ?

2. Attempt **any two** questions : **(5 each)**
   a) Explain with neat diagram element of closed loop control system.
   b) Draw construction diagram of photo conductive cell and explain working with principle of operation.
   c) With neat block diagram explain multichannel DAS using digital multiplexer.

3. Attempt **any two** questions : **(5 each)**
   a) Derive transfer function of RC circuit.
   b) The integral controller is used for velocity control system with a set point 225 mm/sec, within a range of 200 mm/sec to 450 mm/sec. The controller output is 20% initially. The constant $K_I = -0.15\%$ controller output per second per percentage error. If the velocity changes to 325 mm/sec. Calculate the controller output after 1 sec for a constant e_p.

c) State important features of instrumentation amplifier. Find output of the following circuit.



4. Attempt **any one** question : **(10 each)**

a) i) State signal conditioning techniques used in control system. Explain in details signal conditioning technique used for rejection of unwanted signal present with original signal. **5**

ii) The output of opamp based proportional controller is – 14 V corresponding to 0% output and + 14 V for 100% output. Determine the actual output for 80% controller output. **5**

b) i) Enlist liquid level sensors and explain the sensor that donot need any physical contact with liquid. **5**

ii) Draw block diagram of analogue Mux (4 : 1 line) and explain its operation with help of truth table. **3**

iii) Define actuators. Enlist electrical actutators. **2**

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[3918] – 201

S.Y. B.Sc. (Computer Science) (Semester – II) Examination, 2011

CS-221 : OBJECT ORIENTED CONCEPTS AND PROGRAMMING IN C++ (Paper – I)

(2008 Pattern)

Time: 2 Hours Max. Marks: 40

Instructions *: 1) Black figures to the* ***right*** *indicate* ***full*** *marks.*

2) ***All*** *questions carry* ***equal*** *marks.*

1. Attempt all of the following : **(1×10=10)**

   a) What are the different types of containers ?

   b) Define virtual base class.

   c) The input pointer is also called as put pointer. State True/False.

   d) State the rules to define default arguments.

   e) When do you use function overriding ?

   f) Default constructor is always called without any arguments. State True/False.

   g) List any four applications of OOP.

   h) How dynamic allocation is done in C and C++ compare ?

   i) Write the syntax to declare non-member operator function and member operator function.

   j) What will be the output of the following ? cout << setbase(16) << 15;

P.T.O.

2. Attempt **any two** of the following : **(2×5=10)**

a) Write a short note on scope resolution operater and illustrate with example.

b) What is friend function ? Give syntax to declare a friend function. What are the features of friend function ?

c) Write a program to create a list of people (using array) and search for a specific person in the list. Use the class outlines as below.

```
Class person
{
char * name ;
public :
  person (char & str) ;
~person ( );
char * get Name ( );
void display ( );
};
class people
{
person ** array;
int length;
public :
people (int n = 5); || creates a list of n persons.
~people ( );
int search (char* str);
void display ( );
};
```

3. Attempt **any two** of the following : **(2×5=10)**

a) How the operator function is invoked if defined as

i) Member function

ii) Friend Function.

Explain with the help of example.

b) List and explain error handling functions during file operations.

c) Design a base class person (name, address, phone-no). Derive a class employee (e-no, e-name) from person.Derive a class manager (designation, department, basic-salary) from employee. Write a menu driven program to -

i) Accept all details of 'n' managers.

ii) Display manager having highest salary.

4. Attempt **any one** of the following (**A** or **B**) : **10**

A) 1) Explain the use of following with syntax.

i) try block

ii) throw statement

iii) catch block.

2) Write a program to create a vector class template to add, delete and display values from the vector.

OR

B) 1) Explain with examples

a) Overloading by a non-template function.

b) Overloading by template function.

2) Explain the output of the following programs

i)
```
# include <iostream.h>
typede f void (*FPtr) (int, int);
void Add (int i, int j)
{
 cout << i << "+" << j << "=" <<i + j;
}
void subtract (int i, int j)
{
  cout << i << " – " << j << "=" << i – j;
}
void main ( )
{
Fptr ptr;
Ptr = & Add;
Ptr (1, 2);
cout << end l;
Ptr = & subtract ;
Ptr (3, 2);
}
```

ii)
```
# include < iostream.b>
using namespace std;
int main ( )
{
cout. fill ('<');
cout. precision (3);
for (int n = 1 ; n < = 6 ; n++)
{
cout. width (5);
cout << n;
cout.width (10);
cout << 1.0/float (n) << "\n" ;
if (n = = 3)
cout. fill ('>');
}
cout << " in padding changed \n\n" ;
cout. fill ('#') ;
cout. width (15);
cout << 12.345678 << "\n";
return 0 ;
}
```

[3918] – 202

S.Y. B.Sc. (Semester – II) (Computer Science) Examination, 2011
CS-222 : SOFTWARE ENGINEERING (2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions.: *i)* ***All*** *questions are* ***compulsory****.*
ii) ***All*** *questions carry* ***equal*** *marks.*
iii) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Attempt **all** of the following : **(1×10=10)**

   a) What is embeded system ?

   b) What is spike solution ?

   c) What is meant by quality function deployment ?

   d) Give two approaches of analysis modeling.

   e) What is meant by concurrent development model ?

   f) Define work-product.

   g) Give any two views in the system engineering process.

   h) Define software domain analysis.

   i) State the role of core principals in software engineering.

   j) Define Legacy software.

2. Attempt **any two** of the following : **(2×5=10)**

   a) Discuss the steps required to initiate requirement engineering process.

   b) Discuss the human factors that must exist among Agile team members.

   c) Explain spiral model.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Explain any five umbrella activities which are complimented to frame work activities.

   b) Explain working of RAD.

   c) Why does linear model some times fails ?

4. Attempt the following : **(2×5=10)**

   a) Explain any five communication practices.

   OR

   a) What is system simulation ? State its advantages.

   b) Draw contex level DFD, First level DFD and E-R diagram for the - "Web based order processing system for computer store".

[3918] – 205

S.Y. B.Sc. (Semester – II) (Computer Science) Examination, 2011
ELC-221 : ELECTRONICS (Paper – I)
Microcontroller and Embedded Systems
(2008 Pattern)

Time : 2 Hours | Max. Marks : 40

Instructions : *1) **All** questions are **compulsory.***
*2) Figures to the **right** indicate **full** marks.*
*3) **Neat** diagrams must be drawn **wherever** necessary.*

1. Answer the following in **one** or **two** sentences. **(1×10=10)**

   a) What is the function of $\overline{\text{PSEN}}$ pin of 8051 controller ?

   b) In which mode the timer works in auto-reload ? Which register hold the initial count in this mode ?

   c) Give the format of Interrupt Enable (IE) register.

   d) What is the role of PCON register in serial communication ?

   e) Write an instruction to clear 4FH bit of bit addressable memory of 128 byte RAM.

   f) What is the significance of GATE bit of TMOD register ?

   g) Define simulator.

   h) Write an expression for out put current of DAC 0808.

   i) Give any two differences between small scale and Large scale embedded systems.

   j) What is the function of cross-compiler ?

2. Attempt **any two** of the following. **(5×2=10)**

   a) Write an assembly language program to generate square wave form of 25% duty cycle on P2.4.

   b) Explain PSW register with neat block diagram.

   c) Write assembly language program to generate square wave of 4 KHz frequency on P1.4 using timer 1, mode 2.

P.T.O.

3. Attempt **any two** of the following : **(5×2=10)**

   a) Explain the function of following LCD pins

      i) VEE

      ii) RS

      iii) $R/\overline{W}$

      iv) E

      v) DB_7 to DB_0.

   b) Explain system on chip (SOC) with block diagram.

   c) Write assembly language program to accept the data from P1 and send it to P2 continuously while incomming data from serial port is send to P0.

      Assume XTAL = 11.0592 MHz and Baud rate = 9600.

4. Attempt **any one** of the following. **(10×1=10)**

   a) i) Explain following instructions.

      1) LCALL 1200 H

      2) JMP @A+DPTR

      3) ADDC A,R5

      4) SETB 40H

      5) CPL PCON.7

      ii) Find the value of THO and TLO of timer 0, mode l for a delay of 5 ms where XTAL = 11.0592 MHz.

      iii) Write interrupt vector table with their priorities and vector addresses.

   b) i) What is addressing mode ? Explain immediate and indirect addressing modes.

      ii) Explain with neat diagram TCON register of 8051 microcontroller.

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[3918] – 206

S.Y. B.Sc. (Comp. Sci.) (Semester – II) Examination, 2011
ELC-222 : ELECTRONICS (Paper – II) (New)
Digital Signal Processing (2008 Pattern)

Time : 2 Hours Max. Marks : 40

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) Draw **neat** diagrams **wherever** necessary.*

1. Answer the following in **one/two** sentences : **(10×1 each=10)**

   a) What is Seismography ?

   b) State any two applications of DSP.

   c) List two major building blocks of digital signal processor.

   d) Determine whether following signal is periodic

   $x(t) = \cos \frac{\pi}{4} t$.

   e) State role of barrel shifter.

   f) Define LTI system.

   g) State any two features of an image.

   h) What is significance of poles and zeros ?

   i) Define digital filter.

   j) Sketch double line amplitude spectrum for signal

   $x(t) = 5 \cos 20\pi t + 10 \cos 50\pi t$.

2. Attempt **any two** of the following : **(2×5 each=10)**

   a) Enlist functions of program sequences in D.S. processor.

   b) Draw block diagram of digital signal processing system and explain function of each block.

   c) Obtain Z transform for sequence x(n) = {1, 2, 3, 0, 4} and sketch R.O.C.

P.T.O.

3. Attempt **any two** out of the following : **(2×5 each=10)**

   a) Determine 4 point DFT of x(n) = {0, 1, 2, 3}.

   b) A system is described by differential equation

   $$\frac{dy(t)}{dt} + 3y(t) = x(t)$$

   Find output of system when excited by input signal $x(t) = e^{-2t}u(t)$.

   c) Describe radar system with a neat block diagram.

4. Attempt **any one** of the following : **(1×10 each=10)**

   a) i) Explain the role of circular bufferes with the help of neat diagram. **5**

   ii) Explain working of C.D. recording system with a neat diagram. **5**

   OR

   b) I) i) Give functional and graphical representation of any two basic discrete time sequences. **2**

   ii) Explain concept of cache memory in DSP. **3**

   II) i) Obtain Laplace transform of unit step input signal. **2**

   ii) State parameters of ADC. **3**

[3918] – 207

S.Y. B.Sc. (Computer Science) (Semester – II) Examination, 2011
COMPULSORY ENGLISH
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

1. A) Ananya, Roop, Trupti and Vishal are given a topic "My Vision of India". Write the transcript of the discussion in a dialogue form. **5**

   B) You are a journalist of a well-known daily newspaper. You are interviewing a famous singer. Write down five questions and their suitable responses. **5**

2. A) Write a Paragraph on "Current Trends in Social-Networking". **5**

   B) Write a telephonic conversation between Rima and Sarah planning for a movie. **5**

3. A) Punctuate the following sentences. **5**

   1) there are a few pens, pencils and pins in the box.
   2) What are you doing on monday.
   3) how awful the scene is.
   4) Doctors for example work for long hours.
   5) The Boys hostel is on the east street.

   B) Write a summary note of the passage given below. **5**

   Superstitions are 'blind' beliefs that are not based on reason or on the laws of science. They are found in different parts of the world and are handed down from one generation to the next one. For example, it is believed that the breaking of a mirror or a cat crossing one's path bring bad luck. Similarly, finding a horse shoe is supposed to be a sign of good fortune. Superstitions cannot be proved, and we can never be sure if there is any truth in them. However, it is certain that believing in them would burden our minds and fill us with either irrational fear or impossible hopes. Both these have a disturbing effect and take away our peace of mind. It is best to treat superstitions simply as interesting beliefs, and carry on with faith in oneself and in life. (138 words).

4. A) Write a book review on the book which you have recently read. **5**

   B) You are the librarian of your college. Write an e-mail letter to "venus_books @ yahoo. com" asking them for their catalogue. **5**

[3918] – 303

T.Y. B.Sc. (Semester – III) Examination, 2011
COMPUTER SCIENCE
CS – 333 : Computer Networks – I
(Paper – III) (New) (2008 Pattern)

Time : 2 Hours Max. Marks : 40

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Attempt **all** of the following : **(10×1=10)**

a) State the relationship between services and protocol.

b) Define the unacknowledged connectionless service.

c) Define channelization and list three protocols in this category.

d) Why CSMA/CD is not required in full duplex switched ethernet ?

e) What is baseline wandering ?

f) A network with bandwidth of 10 Mbps can pass only an average of 12,000 frames per minute with each frame carrying an average of 10,000 bits. What is the throughput of this network ?

g) Byte stuff the following data :

A	ESC	ESC	Flag	B

h) How does information get passed from one layer to the next in the Internet model ?

i) Draw NRZ-I bit pattern for 01011100.

j) Define home networks.

P.T.O.

2. Attempt **any two** of the following : **(2×5=10)**

   a) With example explain the difference between port address, logical address and a physical address.

   b) What is transmission impairment ? Explain the causes of transmission impairment.

   c) Explain all common fast ethernet implementations.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Define pipelining and its usefulness. How errors are handled in pipelining ?

   b) Discuss the different design issues for the layers.

   c) List three different techniques in serial transmission and explain the differences.

4. Attempt **any one** of the following (**I** or **II**) : **(1×10=10)**

   I) a) Explain the purpose of framing. Discuss character count and bit stuffing methods of framing.

   b) What is controlled access ? List three protocols in this category. Explain any one in detail.

   II) a) Explain need and advantages of piggybacking.

   b) Write short note on :

   i) Switched ethernet.

   ii) CSMA/CA.

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[3918] – 305

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
CS – 335 : PROGRAMMING IN JAVA – I (Paper – V)
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions *: 1) Black figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***All*** *questions carry* ***equal*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** of the following : **(10×1=10)**

a) "If the operating system is changed, the bytecode of a java program should also be changed". State whether True/False and justify.

b) State the advantage of using break with labels.

c) State the restrictions for static method of a class (any two).

d) A class cannot be declared both, abstract and final. State whether True/False and justify.

e) What are the different types of dialogs in java ?

f) What is the difference between checked and unchecked exception ?

g) What is the "peer approach" used by AWT ?

h) Name the method and interface to create an identical copy of an object.

i) The java.io.file class can be used to read contents of a file. State whether True/False and justify.

j) What is the difference between the repaint () and update() method ?

P.T.O.

2. Attempt **any two** of the following : **(2×5=10)**

   a) What is a nested class ? Explain its types with suitable examples.

   b) Write a java program to read contents of a text file. Write all letters in one file, digits in another file and other characters in a third file.

   c) Write a note on the MVC architecture.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Explain the importance of the Object class and explain any three methods of this class.

   b) Accept the name and class-of-study from the user using input dialog and throw a user defined exception "InvalidClass" if the class is not "Fy", "Sy" or "Ty".

   c) Write a program using swing to display the names of four hobbies using check boxes. Display the selected hobbies in a text field when the user clicks the "OK" button.

4. Attempt **any one** of the following (**I** or **II**) : **(1×10=10)**

   I) a) Write a program to define an abstract class "Roundshape" with one data member-radius and a constant PI. Declare abstract methods findarea ( ) and findvolume (). Define a sub class "sphere" and calculate the area and volume of a sphere object. **5**

   b) What is an assertion ? Give its forms. **3**

   c) What is a static block ? What is its use ? **2**

   II) a) What is an applet ? Explain the lifecycle of an applet. **5**

   b) Write a java program to accept two strings as command line arguments and perform the following operations : **3**

      i) compare the strings.

      ii) check if the first string begins with or ends with the second string.

   c) What is the purpose of the javadoc tool ? List any two javadoc tags. **2**

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[3918] – 306

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
CS-336 : OBJECT ORIENTED SOFTWARE ENGINEERING
(Paper – VI)
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Neat diagrams must be drawn ***wherever*** *necessary.*
3) Black figures to the ***right*** *indicate* ***full*** *marks.*

1. Attempt **all** of the following : **(10×1=10)**

   a) How to organize the objects ?

   b) "Object is an instance of class" – State true or false and justify in short.

   c) Define limited polymorphism.

   d) Give the drawback of using a function/data methods in system development.

   e) Give any two advantages of UML.

   f) What is the purpose of packages ?

   g) What is meant by stereotypes ?

   h) What is a use of component diagram ?

   i) What is meant by swimlanes ?

   j) What is actually tested in White Box Testing ?

2. Attempt **any two** of the following : **(2×5=10)**

   a) Discuss the components of use case diagram.

   b) Explain an iterative development life cycle. Discuss the benefits.

   c) Give the steps of object design process.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) What is a collaborations ? Explain behavioral aspects of a collaborations.

   b) Explain inter class test case design.

   c) Prepare a class diagram for college library system consisting of atleast 3 classes. Define appropriate relationships, associations with multiplicity.

4. Attempt the following : **10**

   a) An automated system is to be designed for ATM banking. A bank can have multiple customers and all of them are issued the ATM cards. Customer swap the card which is verified by a ATM. Customer select the kind of a transaction. If the transaction is to withdraw amount, it verifies the limit and minimum balance required. It also prints various transaction reports, account balance statement, etc.

      Considering above aspects, draw the following UML diagrams considering all notations :

      i) Draw use case diagram. **3**

      ii) Draw sequence diagram. **4**

   b) A stack is having push and pop operations to insert and delete elements. Draw a state transition diagram for it considering all possible states. **3**

      OR

   b) A student visits the college office for getting a scholarship amount. His/her claim is verified and if it is valid a cheque is issued and entries are updated in a account. Draw activity diagram for the above situation. **3**

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[3918] – 402

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE (Paper – II)
CS-342 : Theoretical Computer Science and Compiler Construction – II
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions : *i) Figures to the **right** indicate **full** marks.*
*ii) **All** questions carry **equal** marks.*
*iii) **All** questions are **compulsory**.*

1. Attempt **all** of the following : **(1×10=10)**

   a) What is translator ? Give one example.

   b) State the pattern of regular expression "Signed number" in Lex language notation.

   c) What is basic block ?

   d) Which parsers are not able to handle left recursion ?

   e) What are classes of SDD ?

   f) State True or False : Number of states in SLR parser and LR(1) parser are same.

   g) Define Dependency Graph.

   h) Justify : Removing extra blank spaces, lines and comments are functions of parser.

   i) Define Cross Compiler.

   j) List for actions of LR parser.

P.T.O.

2. Attempt **any two** of the following : **(2×5=10)**

   a) Check whether the given grammar is LL(1) or not.

   $E \rightarrow TE'$

   $E' \rightarrow +TE' | \in$

   $T \rightarrow FT'$

   $T' \rightarrow *FT' | \in$

   $F \rightarrow (E) | id$

   b) For the input expression 3 * 5 + 4n, design SDD and draw annotated tree using following grammar :

   $L \rightarrow E$

   $E \rightarrow E_1 + T | T$

   $T \rightarrow T_1 * F | F$

   $F \rightarrow (E) | digit$

   c) What are the steps of execution of LEX program ? Write a LEX program to count total number of vowels and total number of consonents from the input string.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Consider the following grammar and input string. Parse the string using shift-reduce parser. Show the content of stack, input and action taken at each stage.

   $S \rightarrow 0B | 1A$

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

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

   Input string : 100110

b) Define Directed Acyclic Graph (DAG). Construct DAG for the following expressions :

i) (a + a * (b – c) + (b – c) * d)

ii) (a + b) * (c – d) / f * (a + b)

c) Check whether the following grammar is SLR or not.

$S \rightarrow A + B \mid A * B$

$A \rightarrow aA \mid a$

$B \rightarrow Ab \mid b$

4. Attempt the following :

a) Check whether the given grammar is LALR (1) or not.

$S \rightarrow 0A_2$

$A \rightarrow 1A1 \mid 1$ **6**

OR

a) 1) Construct a Recursive Descent Parser for the following CFG :

$S \rightarrow bA \mid aB$

$A \rightarrow aA \mid b$

$B \rightarrow bB \mid c$ **3**

2) Define :

i) flowgraph

ii) value number for a node of DAG. **2**

3) State difference between annotated parse tree and dependency graph. **1**

b) Consider the following SDD and find the dependency graph for the expression : **4**

float x, y, z

Production	Semantic Rules
$D \rightarrow TL$	L.in := T.type
$T \rightarrow int$	T.type := integer
$T \rightarrow real$	T.type := real
$L \rightarrow L_1, id$	L_1.in := L.in addtype (id.entry, L.in)
$L \rightarrow id$	addtype (id.entry, L.in)

OR

b) Construct Operator Precedence table for following grammar : **4**

$S \rightarrow S - P \mid P$

$P \rightarrow P * R \mid R$

$R \rightarrow (S) \mid q$

———————

[3918] – 404

T.Y. B.Sc. (Computer Science) (Semester – IV) Examination, 2011
CS – 344 : WEB DEVELOPMENT AND PHP PROGRAMMING – II
(Paper – IV) (2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions *: 1) Black figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***All*** *questions carry* ***equal*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** of the following : **(10×1=10)**
   a) State difference between database specific extension and database independent PEAR DB library.
   b) How to find out number of rows returned by the result set ?
   c) What is thumbnail ?
   d) What are the uses of XML ?
   e) How to find out height of the image ?
   f) What is DOM ?
   g) How we make web page interactive ?
   h) What is UDDI ?
   i) What is the callback function ?
   j) State the SMTP protocol.

2. Attempt **any two** of the following : **(2×5=10)**
   a) Explain the methods with complete examples.
      i) mysql-fetch-array ()
      ii) mysql-drop-db ().
   b) Draw a picture of a smiling face and save this picture as “face.gif”.
   c) What are the different kinds of parsers used in XML ?

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Consider the following entities and their relationships.

   student (seat-no, sname, class)

   Subject (sub-no, sub-name)

   Stud-sub (seat-no, sub-no, marks)

   Write php script to accept seat-no from user and print sname, marks of all subjects, total marks and percentage.

   b) Explain the structure of an email message.

   c) What are four basic patterns of operation supported by WSDL ?

4. Attempt **any one** (**A** or **B**) : **(1×10=10)**

   A) i) Write note on AJAX PHP framework.

   ii) Write PHP script to read emp. XML file (contains emp-no, emp-name, salary, designation) and print employee details in tabular format. (use Simple XML)

   B) i) Explain about SOAP building block. **3**

   ii) Alert box of Javascript. **2**

   iii) Write an ajax program to display list of book stored in an array on clicking ok button. **5**

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[3918] – 405

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE (Paper – V)
CS-345 : Programming in Java – II
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

1. Attempt **all** of the following : **(1×10=10)**
   a) Give any two constructors to create color object.
   b) Explain the purpose of yield( ) method ( ) in the context of thread.
   c) What is use of callable statement ?
   d) List various map interfaces and classes.
   e) What is the use of method get session( ) ?
   f) What are the parameters of doGet( ) method ?
   g) Define the term port in the context of socket programming.
   h) Name any two builder tools for java beans.
   i) Which JSP tag is used to give declaration ?
   j) State the purpose of method move To Insert how ( ).

2. Attempt **any two** of the following : **(2×5=10)**
   a) The project table in a database has following structure/fields

title	-	text
stud. name	-	text
duration	-	number (int)
class	-	text
subdate	-	date

   Write a java program to read the project details from user and add it in table. Continue the process until user press '1' to the prompt "Add more (Yes)/ (No) ?"

P.T.O.

b) Explain the concept of thread synchronization and the use of methods wait and notify with an example.

c) Write a servlet which accepts two numbers from an HTML form and displays their sum and difference on another page.

3. Attempt **any two** of the following : **(2×5=10)**

a) Write a java program to store telephone user details having contact number as key and user name as value. Search the user name from given contact number. If search is successful then continue to read the next number. Use suitable collection.

b) Explain the ISP scripting elements with suitable examples.

c) Write a client socket that will accept n names from user and send them to the server. After receiving the names, the server socket should send the message "Good Bye" and close the connection.

4. Attempt **any one** of the following (**A** or **B**) : **(1×10=10)**

A) 1) Write short note on precompiled SQL. How to create it and use it ? **4**

2) Explain any 4 methods of the font class. **4**

3) What is the importance of jar and manifest files in java beans ? **2**

B) 1) Explain different ways of session tracking in servlets. **4**

2) Write a program to create a thread which displays a message "Welcome to Java" 100 times with a delay of 5 seconds between messages. Use the runnable interface. **4**

3) Write any two differences between Array List and Linked List. **2**

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[3918] – 406

T.Y. B.Sc. (Computer Science)(Semester – IV) Examination, 2011
CS – 346 : BUSINESS APPLICATIONS (Paper – VI)
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

***Instructions** : 1) **Neat** diagrams must be drawn **wherever** necessary.*

*2) Black figures to the **right** indicate **full** marks.*

*3) **All** questions are **compulsory.***

1. Attempt **all** of the following : **(1×10=10)**

   a) What is the content of quotation ?

   b) What is the objective of sales analysis ?

   c) Give the names of any two types of leaves.

   d) Define Indirect material.

   e) Define Bill of material.

   f) Write the formula to calculate EOQ in inventory control.

   g) State any two benefits of ATM in banks.

   h) Give any two things to be considered while opening a saving's account.

   i) Define uses of CRM.

   j) Define TQM.

2. Attempt **any two** of the following : **(2×5=10)**

   a) Explain the recruitment process with the help of neat diagram.

   b) Explain the objectives of Material Requirement Planning.

   c) Give the advantages of ERP.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Write the importance of biometric devices.

   b) What is meant by performance appraisal ? Give any four objectives of appraisal.

   c) Explain the activities of supply chain management.

4. Attempt the following :

   a) "Glaxo Pvt. Ltd.", is an antibiotic manufacturing company located at Nashik, that deals with production and sales of medicines. The sales and marketing department of the company deals with the sale of medicines to different medical shops within the city, as well as to all medical shops outside the city. The order processing for medical shops outside the city, is done through dealers, who accept orders from the shops within their area and forward it to the sales and marketing department of the company. The medicines are sent to the dealer site and from there it is distributed to the corresponding shops.

   During above process it is found that, there is a lot of time lapse between the placing of orders and obtaining the medicines, for the shop's outside the city. Due to this most of the medicines remain out of stock, in these shops.

   Suggest a suitable business process to model the above situation, so that order processing for medical shops can be faster, even though it has to go through a dealer. To specify a business process :

   a) Suggest main processes using any diagram. **2**

   b) Suggest atleast 3 input documents in detail. **3**

   c) Suggest atleast 2 report layouts in detail. **2**

   b) Draw the structure of Bin Card. **3**

   OR

   b) Explain any three services provided through E-banking. **3**

[3918] – 701

T.Y.B.Sc. (Computer Science) (Semester – III) Examination, 2011
COMPUTER SCIENCE
CS-331 : System Programming – I (Paper – I)
(2004 Pattern) (Old Course)

Time : 2 Hours Max. Marks : 40

***Instructions** : 1) Neat diagrams must be drawn **wherever** necessary.*
*2) **All** questions carry **equal** marks.*
*3) Assume suitable data, if **necessary**.*
*4) **All** questions are **compulsory**.*

1. Attempt **all** of the following : **(10×1=10)**

   a) Define : Debugger.

   b) Explain PC relative address mode.

   c) Explain the role of travelling manager used in the design of editor.

   d) List out any two features of assembly language.

   e) What is dead – code elimination ?

   f) Write difference between macro and subroutine.

   g) What is P-code compiler ?

   h) Explain the role of ENTRY and EXTRN statements.

   i) Define Recursive – Descent parsing.

   j) What do you mean by forward reference ?

2. Attempt **any two** of the following : **(2×5=10)**

   a) What is macro-assembler ? Explain the pass structure macro-assembler.

   b) What is top-down parsing ? Write a short note on implementation of top-down parsing.

   c) What do you mean by non-relocatable program and relocatable program ? Explain each with suitable example.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Explain any two advanced assembler directives.

   b) Why bottom-up parser is called as "Shift-Reduce" parser ? Explain with suitable example.

   c) What is macro ? Differentiate between formal parameters and actual parameters for macro. Give example.

4. Attempt **A** or **B** of the following :

   A) i) Write a short note on value numbering technique. **5**

   ii) Explain any three imperative statements. **3**

   iii) Define the following terms : **2**
   a) Interpreter
   b) System program.

   B) i) Differentiate between static storage allocation and dynamic storage allocation. **5**

   ii) List out any three imperative statements in which register field is used. Also give example. **3**

   iii) What is code optimization ? Why it is necessary to perform code optimization ? **2**

[3918] – 704

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
CS 334 : SERVER DATABASES AND APPLICATION DEVELOPMENT – I
(2004 Pattern) (Paper – IV)

Time : 2 Hours Max. Marks : 40

Instructions : *1)* ***Neat*** *diagrams must be drawn* ***wherever*** *necessary.*
2) Black figures to the ***right*** *indicate* ***full*** *marks.*
3) ***All*** *questions are* ***compulsory.***

1. Attempt **all** of the following. **(10×1=10)**

   a) Write uses of trigger.

   b) What is use of NOCACHE in seqence ?

   c) State difference between % type and % rowtype attributes.

   d) What is serial schedule ?

   e) Define binary lock.

   f) State the purpose of create view command.

   g) Define term polyinstantiation.

   h) What is system log ?

   i) State two tier architecture.

   j) What is transaction server ?

2. Attempt **any two** of the following. **(2×5=10)**

   a) Explain how errors and exceptions are handled in PL|Pgsq|.

   b) Explain the different transactions states.

   c) What is role of the Database Administrator in the security ?

P.T.O.

3. Attempt **any two** of the following. **(2×5=10)**

a) Consider the following transaction

T_1:	T_2:
Read (X)	Read (X)
X =X+20	Read (Z)
Read (Y)	Z = X+Z
Write (X)	Write (Z)
Read (Z)	Read (Y)
Y = Y+Z	Y = Y+40
Write (Y)	Write (Y)

Give atleast two non-serial schedules that are serializable to serial schedule $<T_1, T_2>$.

b) Consider following are the log entries at the time of system crash.

[Start T_o]
[Write T_o, P, 70]
[Commit T_o]
[Check point]
[Start T_1]
[Write T_1, Q, 55]
[Write T_1, R, 20]
[Commit T_1]
[Start T_2]
[Write T_2, Q, 30]
[Start T_3]
[Write T_3, P, 100]
[Write T_2, R, 90]
System Crash

If deffered update technique is used, what will be the Recovery procedure ?

c) Explain multiple granularity.

4. Attempt **any two** of the following : **(2×5=10)**

a) Consider the following relational Database.

employee (emp-no, emp-name, salary, commission, dept-no)

department (dept-no, dept-name, location)

Write PL|pgsq| block to display departmentwise employee name.

b) Explain two phase locking protocol.

c) What are benefits accepted from Client/Server System ?

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[3918] – 705

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
CS – 335 : PROGRAMMING IN JAVA – I (Paper – V)
(2004 Pattern)

Time : 2 Hours Max. Marks : 40

1. Attempt **all** of the following : **(10×1=10)**

   a) "Java is a pure object oriented language". State whether True/False and justify.

   b) State the difference between a class variable and instance variable.

   c) State the purpose of "this" keyword.

   d) What is an abstract class ?

   e) An anonymous inner class cannot have a constructor. Comment.

   f) What is a checked exception ?

   g) Name the two topmost character stream classes.

   h) State the purpose of a layout manager.

   i) "An applet class can have a constructor". State whether True/False and justify.

   j) Why are AWT components called "heavy weight" components ?

2. Attempt **any two** of the following : **(2×5=10)**

   a) Explain the use of "super" keyword with the help of examples.

   b) Give the structure of the APPLET tag and explain any four attributes.

   c) Write a Java program to accept the name of a text file as command line argument. If the file exists, display its contents. If it does not exist, create the file by accepting characters till the user enters "*".

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Write a java program to accept e-mail address of a user and throw a user defined exception "Invated Email Exception" if it does not contain '@' symbol.

   b) What is an Interface ? Explain its use in achieving multiple inheritance.

   c) Write a java program using swing to create three check boxes – Red, Green, Blue. Display the selected colors in a text field.

4. Attempt **any two** of the following : **(2×5=10)**

   a) Explain the use of final, finally and finalize with examples.

   b) Define an abstract class "Account" having protected members – account number and owner. Define a parameterized constructor. Create one subclass "Saving Account" with member – Rate of interest. Create n objects of Saving Account class and display details.

   c) Write a java program using swing to create a frame having three text fields. Count how many times the string in the second field occurs in the first. Display the result in the third text field.

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[3918] – 706

T.Y. B.Sc. (Computer Science) (Semester – III) Examination, 2011
CS – 336 : SOFTWARE ENGINEERING – I (Old Course)
(Paper – VI) (2004 Pattern)

Time : 2 Hours Max. Marks : 40

***Instructions** : 1) **Neat** diagrams must be drawn **wherever** necessary.*
*2) Black figures to the **right** indicate **full** marks.*
*3) **All** questions are **compulsory**.*

1. Attempt **all** of the following : **(10×1=10)**

a) What is the primary goal of software engineering ?

b) What radius indicates in spiral model ?

c) Give any two desirable characteristics of S.R.S.

d) Comment on, "System analyst acts as a bridge between customer and development team."

e) Define technical feasibility.

f) Explain tramp data.

g) What is use of factoring ?

h) Give drawbacks of common coupling

i) Give any two objectives of input design.

j) What is meant by closed response question ?

2. Attempt **any two** of the following : **(2×5=10)**

a) Explain any five McCall's quality factors.

b) Explain analysis and design phases of S.D.L.C.

c) What is data dictionary and explain advantages of data dictionary ?

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Differentiate structured interview with unstructured interview.

   b) Stay fit Gymnecium charges membership fees as per the following rules :

   – For males below 50 years of age, charges are Rs. 12,000/- per annum and for female category, charges are Rs. 10,000/- per annum.

   – 10% discount is given in each of the above category if age is above 50 years, prepare a decision tree for the above description.

   c) "Coupling and cohesion are related to each other." State true or false and justify.

4. Attempt the following : **(10)**

   a) Lifecare Hospital is having a growing list of patients. There are 25 beds in general ward, 10 beds in semi-special ward, and 5 beds in special ward. Around 15 doctors are working with it and more than 50 supporting staff is appointed in it.

   To maintain the records of patients, diagnosis details, doctors visits, services given, Hospital management wants an automated system.

   For the above case : **7**

   i) Identify all entities.

   ii) Draw a context level logical D.F.D.

   iii) Draw first level D.F.D's.

   b) What is a module ? Discuss different types of module. **3**

   OR

   c) Give the steps to built the decision table. **3**

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[3918] – 803

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE
CS-343 : Computer Networks and Network Administration – II
(2004 Pattern)

Time : 2 Hours Max. Marks : 40

N.B. : *1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) Draw **neat** and well labelled diagram **wherever** necessary.*

1. Attempt **all** of the following : **(10×1=10)**

   a) What is Fragmentation ?

   b) List any two role performed by Network Administrator.

   c) Which transmission modes are supported by FTP for File transfer ?

   d) What is non adaptive routing ?

   e) What are the features of RAID level '1' ?

   f) How switches are different from bridges ?

   g) What is mean by trustee rights ?

   h) What is application of traceroute command ?

   i) What is address resolution ?

   j) List the contents of request message used in HTTP.

2. Attempt **any two** of the following : **(2×5=10)**

   a) Discuss Firewall. How it is helpful for network protection ?

   b) Explain the addressing mechanism in detail used by network layer.

   c) Draw and explain TCP segment format.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Differentiate in between workgroup and domain.

   b) What are potential network performance problem ? Explain physical layer issues in detail.

   c) Write short note on :

      i) Routers ii) Gateway

4. Attempt **any two** of the following : **(2×5=10)**

   a) What are the factors due to congestion occurs ? Explain closed loop solutions for congestion control.

   b) Differentiate in between virtual circuit and datagram.

   c) Explain the working of SMTP.

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[3918] – 806

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE
CS-346 : Software Engineering – II
(2004 Pattern)

Time: 2 Hours Max. Marks: 40

Instructions *: 1)* ***Neat*** *diagrams must be drawn* ***wherever*** *necessary.*
2) Black figures to the ***right*** *indicate* ***full*** *marks.*
3) ***All*** *questions are* ***compulsory****.*

1. Attempt **all** the following : **(1×10=10)**

   a) Which are different quality factors ?

   b) Give any two features of Real time implementation.

   c) What is stress testing ?

   d) Define Reverse-Engineering.

   e) In Increment implementation,both stub and driver as dummy modules are required. Justify.

   f) What is quality control ?

   g) Explain in short-Random test generator.

   h) What is change over ?

   i) Explain unstructured maintenance.

   j) What is CPA ?

2. Attempt **any two** of the following : **(2×5=10)**

   a) What is software maintenance ? Explain types of software maintenance.

   b) What is traditional approach of Implementation and what is 11^{th} hour disaster ?

   c) What is ISO ? State the requirements defined by ISO 9001.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Which methods are used in Black Box Testing ?

   b) Explain Drawbacks and Benefits of CASE tools.

   c) Explain the process of optimization and tunning of the system.

4. Attempt the following :

   a) A newly established CISCO Pharma Company which is in north zone of Maharashtra. Company has 500 workers in different shifts. Company running in three shifts. Time table of shift are manually managed and the worked completed by employees are holed manually.

   Company wants to implement computerized automated system to maintain all activities. Consider above case and suggest any three implementation activities and testing techniques. Give in short importance of each activity. **6**

   b) Explain the use of Test-script language. **4**

   OR

   b) Set the system boundaries for a 'Sales and purchase system'. Show which part is done manually, in batch, on-line and Real time ?

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[3918] – 101

S.Y. B.Sc. (Computer Science) (Semester – I) Examination, 2011
CS – 211 : DATA STRUCTURES USING 'C'
(Paper – I) (New) (2008 Pattern)

Time : 2 Hours Max. Marks : 40

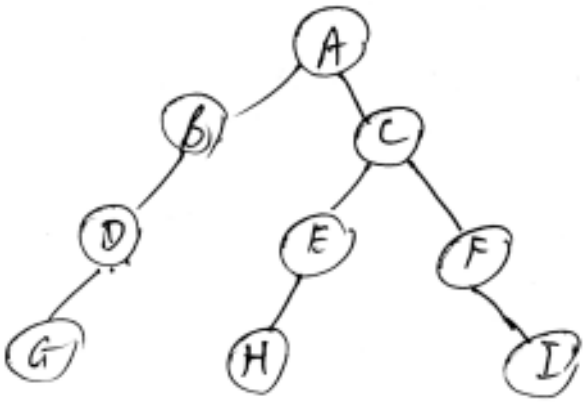
1. Attempt **all** of the following : **(1×10=10)**

a) What are the components of space complexity ?

b) Define 'stable sorting method'.

c) What is time complexity of merge sort ?

d) Give the postorder and preorder traversals for the following tree.



e) What are the advantages of doubly linked list ?

f) Convert the following expression from prefix to postfix form

+ * AB + * CDE

g) Define Balance factor of a node in a binary tree.

h) Write the formula for address calculation of element of two dimensional array.

i) Define Siblings and give its example.

j) Define priority queue.

P.T.O.

2. Attempt **any two** of the following : **(2×5=10)**

   a) Write a ‘C’ function to insert an element at particular position in double linked list.

   b) Write a function to perform preorder tree traversal.

   c) Write a ‘C’ function to accept parenthesise expression to check whether the paranthesis are matching or not, show appropriate message.

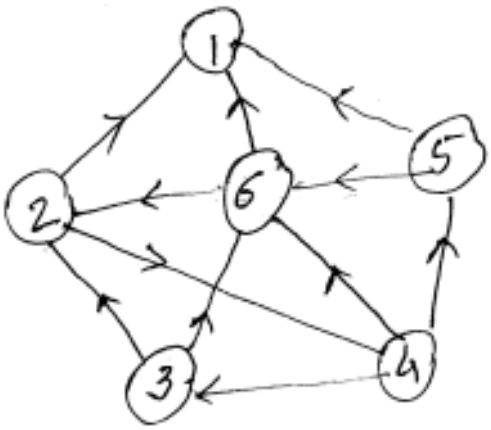
3. Attempt **any two** of the following : **(2×5=10)**

   a) Sort the following data by using Heap sort procedure

      13, 4, 11, 15, 59, 27, 19, 3, 5, 93.

   b) Write a function for adding and deleting element from a circular queue.

   c) Write the adjacency matrix and adjacency list of the following graph.



4. Attempt **any one** of the following (**A** or **B**) : **(1×10=10)**

   A) a) Sort the following data in ascending order using bubble sort method. **4**

      Nashik, Ahmednagar, Pune, Baramati, Loni, Aurangabad.

b) Define the following terms : **3**

i) Outdegree of graph

ii) Right skewed binary tree

iii) Stack time.

c) Write a function to create a list and return the pointer of first node of the list. **3**

B) a) What is generalized linked list ? **4**

b) Short note on deque. **3**

c) Construct the binary search tree for following data. **3**

70, 35, 9, 85, 90, 22, 1, 6, 75, 105.

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[3918] – 105

S.Y. B.Sc. (Computer Science) (Semester – I) Examination, 2011
ELECTRONICS
ELC 211 : Microprocessor Architecture and Programming (Paper – I)
(New Course) (2008 Pattern)

Time : 2 Hours Max. Marks : 40

Instructions** : 1) **All** questions are **compulsory.

*2) Figures to **right** indicate **full** marks.*

*3) **Neat** diagram must be drawn **whenever** necessary.*

1. Answer the following questions in **one** or **two** sentences. **(1×10=10)**

a) ALU of register organized CPU has 5-bit control line. How many number of operations performed by CPU ?

b) What is Volatility of memory ?

c) What is cycle stealing mode of data transfer in DMA ?

d) Why pentium is called superscalar processor ?

e) If CS and IP contains are 2000 H and 0800 H respectively, calculate the physical address of the main memory location in real mode.

f) Identify the instruction type as per the classification for following instructions : LODS, SETC.

g) In which addressing modes offset adjustments are available ?

h) Give the role of cross complier.

i) What is difference between END and ENDP directive ?

j) Find the output for the following program :

```
MOV AX, 0408H

BSWAP AX

SUB AH, AL
```

P.T.O.

2. Attempt **any two** of the following : **(5×2=10)**

   a) Give the features of Universal Serial Bus (USB) and explain USB connectors with pin functions.

   b) Draw functional block diagram of Pentium microprocessor and explain U-pipe and V-pipe of the Pentium.

   c) Explain the function of AAA instruction with proper example.

3. Attempt **any two** of the following : **(5×2=10)**

   a) Explain with example :
      i) Register addressing mode
      ii) Direct addressing mode
      iii) Based-Index addressing mode with displacement.

   b) Distinguish between MLL, ALL and HLL.

   c) Write assembly program to convert 8 - bit binary number to decimal number.

4. Attempt **any one** of the following : **(10×1=10)**

   A) i) Explain DMA controller with neat diagram. **5**

      ii) Draw the flag register of pentium processor and explain basic flags in detail. **5**

   B) i) Write assembly program to subtract two hex numbers and display the output. **5**

      ii) a) For pentium descriptor a base address is of 12030010 H limit of 00010 H and G = 1 what is the starting and ending locations are addressed by this descriptor ? **3**

      b) Explain the role of cache memory in Pentium architecture. **2**

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[3918] – 107

S.Y. B.Sc. (Computer Science) (Semester – I) Examination, 2011
ENGLISH (2008 Pattern)

Time : 2 Hours Max. Marks : 40

1. Answer **any two** of the following : **10**

   A) State whether the following situations are formal or informal

      i) News reader reading news bulletin.

      ii) Job interview.

      iii) Ladies' Kitty party.

      iv) Telephonic conversation between father and son.

      v) A Talk in a conference.

   B) Identify the correct collocation.

      i) Press an icon or click on an icon.

      ii) Commit a crime or make a crime.

      iii) Stare at or stare towards.

      iv) Fluent english or easy english.

      v) Strong support or big support.

   C) Write down points for a brief talk on :

      "Reality shows on television".

2. A) Use the following words in sentences to bring out the literal and figurative meaning. **4**

      (Make two sentences using each word)

      Fast, Note.

   B) Differentiate between the following pairs of words and use them in sentences : **4**

      i) weak, week

      ii) stationary, stationery.

P.T.O.

C) Choose the correctly spelt word from the following sets of words : **2**

i) delibrate, dailibret, deliberate.

ii) Univarcity, Univercity, University.

3. A) Match the following : **4**

i) Forgive	a) pail
ii) Location	b) pure
iii) Bucket	c) pardon
iv) Flawless	d) place

B) Re-arrange the letters to make meaningful words using the hints below : **4**

i) nibalcan (one who eats human flesh)

ii) talaf (dealing with death)

iii) sieatht (one who does not believe in the existence of God)

iv) rusenry (a place where plants are reared)

C) Write the antonyms of the following words. **2**

i) evil

ii) organize.

4. Answer **any two** of the following : **10**

A) Write the phonetic transcription for the following :

i) pin ii) father iii) gem iv) bark v) debt

B) Write appropriate expressions for the following situations :

i) Responding to good news

ii) Expressing thanks

iii) Closing a conversation

iv) Introducing oneself

v) Giving support and reassurance

C) You are a Bank Manager. Write down five questions you would ask a student who has applied for study loan.

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[3918] – 203

S.Y. B.Sc. (Semester – II) (Computer Science) Examination, 2011
MATHEMATICS (Paper – I)
MTC – 221 : Computational Geometry
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

N.B.: *i)* ***All*** *questions are* ***compulsory****.*
ii) Figures to the ***right*** *indicate* ***full*** *marks.*
iii) ***Use*** *of single memory, non-programmable scientific calculator is* ***allowed****.*
iv) Graph papers will be supplied on ***demand.***

1. Attempt the following : **10**

i) If the transformation matrix $\begin{bmatrix} 2 & -3 \\ 1 & -2 \end{bmatrix}$ is applied to a circle of radius 100 units, then find the area of resulting figure.

ii) Apply scaling in X-co-ordinate by factor 4 units on the point P[– 1 4].

iii) What is determinant of the inverse of any pure rotation matrix ?

iv) Write the transformation matrix for shear in y-co-ordinate proportional to z-co-ordinate by factor $\frac{1}{4}$ units.

v) Obtain the transformation matrix for a cabinet projection for $\alpha = 25^{\circ}$.

vi) Find the value of $\delta\theta$ to generate 36 points on the circle $(x - 2)^2 + (y + 2)^2 = 25$.

vii) Write the transformation matrix for the reflection through the line $y = -x$.

viii) Define : Perspective projection.

ix) Explain : Foreshortening factor.

x) State any two properties of Be'zier curve.

P.T.O.

2. Attempt **any two** of the following : **10**

   i) Consider the unit square { [0, 0], [1, 0], [1, 1], [0, 1]} if we apply a general 2×2 transformation matrix [T] = $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then show that the area of the transformation figure is det [T].

   ii) Find the transformation matrix under which a circle with radius 4 is transformed to an ellipse with semi-major axis 4 and semi-minor axis 2.

   iii) Rotate the line segment between the points A[1 2] and B[3 6] by an angle 90° about the midpoint of the line segment AB. And hence find transformed points.

3. Attempt **any two** of the following : **10**

   i) Derive the transformation matrix for single point perspective projection on to the Z = 0 plane from the centre of projection at $Z = Z_c$ on the Z - axis.

   ii) Obtain transformed position vectors of the vertices of ΔABC, when ΔABC is rotated through an angle 90° about the local X-axis passing through A [– 1 2 2 1], B [2 1 2 1], C [2 3 2 1].

   iii) Determine the dimetric projection if the foreshortening factor along z-axis is $\frac{1}{5}$ with $\phi > 0$, $\theta > 0$.

4. Attempt **any one** of the following : **10**

i) a) Show that the parabola $y^2 = x$ is transformed to origin centred unit circle under the transformation

$$[T] = \begin{bmatrix} 0 & -2 & 2 \\ -2 & 2 & -2 \\ 1 & 0 & 1 \end{bmatrix}.$$

b) Find the parametric equation of a Be'zier curve determined by the Be'zier polygon $\{B_0[-1, -1], B_1[2, 3], B_2[3, 3], B_3[5, 2]\}$. Also find P(0.6).

ii) Generate uniformly spaced 8 points on the ellipse $\frac{x^2}{16} + \frac{y^2}{1} = 1$.

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[3918] – 403

T.Y. B.Sc. (Semester – IV) Examination, 2011
COMPUTER SCIENCE (Paper – III)
CS – 343 : Computer Networks – II
(2008 Pattern)

Time : 2 Hours Max. Marks : 40

***N.B.**: 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*

1. Attempt **all** of the following : **(10×1=10)**

   a) Based on mobility IEEE 802.11 supports which types of stations ?

   b) How cache memory speeds up ARP operation ?

   c) Name the topologies used in backbone networks.

   d) By using substitution cipher transform the message "Happy Birthday to You". Key is '5'.

   e) A packet has arrived with M bit value is 0. Is this the first fragment, the last fragment, or a middle fragment ?

   f) Define well known port and ephemeral ports.

   g) Find the total number of addresses in 204.16.37.39/28 used in the address block.

   h) List the services of user agent.

   i) What is bluetooth ?

   j) List the fundamental services offered by DNS sec.

2. Attempt **any two** of the following : **(2×5=10)**

   a) What is the need of network address translation ? How NAT router maintains translation table ?

   b) What is address resolution ? Explain all steps required for a host or router needs to use ARP.

   c) Explain the different features supported by TCP.

P.T.O.

3. Attempt **any two** of the following : **(2×5=10)**

   a) Explain IPv_4 fragmentation process in detail.

   b) Explain the concept of DNS spoofing. Discuss the strategies used to prevent DNS spoofing.

   c) What is transparent bridge ? Explain learning process of a bridge.

4. Attempt **any one** of the following (**I** or **II**) : **(1×10=10)**

   I) a) Discuss POP_3 and $IMAP_4$ message access protocols.

      b) Explain any two scenarios of email architecture.

   II) a) By using transposition cipher convert the following :

      Plaintext : “The reverse process of transforming ciphertext message back to plaintext message is called decryption”.

      Key : ZQARXPM

      b) What is routing ? Explain the desirable characteristics of routing algorithms.

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[3918] – 804

T.Y. B.Sc. (Semester – IV) (Computer Science) Examination, 2011
CS – 344 : SERVER DATABASES AND APPLICATION DEVELOPMENT – II
(2004 Pattern)

Time : 2 Hours Max. Marks : 40

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) ***Neat*** *diagrams must be drawn* ***wherever*** *necessary.*
3) Black figures to the ***right*** *indicate* ***full*** *marks.*

1. Attempt **all** of the following : **(10×1=10)**

   a) List the advantages of php.

   b) What is variable interpolation ?

   c) State the built in construct to locate first position of array from any position.

   d) Give difference between ucfirst ( ) and ucwords ( ) functions.

   e) Write anonymous function to concatenate two strings.

   f) What is introspection ?

   g) How to destroy a cookie ?

   h) What is maximum size of a file that can be uploaded using php and how can we change this ?

   i) What is DSN ?

   j) State the purpose of flock ( ) function.

2. Attempt **any two** of the following : **(2×5=10)**

   a) Explain variable scope in function.

   b) Explain how to send string to the browser.

P.T.O.

c) State the following functions with example.

i) shuffle ( )

ii) array _ multisort ( )

iii) parse _ url ( )

iv) str _ pad ( )

v) string _ replace ( )

3. Attempt **any two** of the following : **(2×5=10)**

a) Write a php script to create xyz.doc file which contain xstr_repeat ($s, $n) to return a string with n times repetition without using built in function. Call the same function in php program.

b) Expalin the directory reading in php with suitable example.

c) Write a php script, given a flat file of telephone info, custid, name, no. of calls. Read this file and print the bill with rent, Re. 80 per call.

4. Attempt **any two** of the following : **(2×5=10)**

a) Agent (aid, aname, address, mobno.)

Estate (eno, type, location, price)

Customer (cust no, cust name, purdate)

AEC (aid, eno, custno, pur_date)

Write a php script to accept agent name from user and print details he sold.

b) Write a php script to create a login form with machine name and password, once a user login the second form should be display to accept the machine details (mno, shiftno, date, time). If the user does not enter information within specified time limit, expire his session and give warning.

c) Explain how to combine cookie and session.

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