

Total No. of Questions :5]

SEAT No. :

**P3260**

**[5037]-11**

[Total No. of Pages : 2

**M.Sc.**

**COMPUTER SCIENCE**

**CS-101 : Principles of Programming Languages  
(2011 Pattern) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

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

**Q1)** Attempt all of the following:

**[8×2=16]**

- a) Define applicative and normal order evaluation
- b) What is initialization and finalization.
- c) State any 2 applications of prolog.
- d) Differentiate between coroutines and subroutines.
- e) Purpose of fail predicate in Prolog.
- f) Define
  - i) First class subroutine.
  - ii) Second class subroutine.
- g) What is “this” in C++? Explain.
- h) Define multithreading.

**Q2)** Attempt any Four of the following:-

**[4×4=16]**

- a) Differentiate between imperative and declarative languages with important subclasses.
- b) What is subroutine closure? What it is used for and how it is implemented?
- c) Explain binding rules and scope rules.
- d) What is exception handling? Explain with example.
- e) What makes a programming language successful?

**P.T.O.**

**Q3)** Attempt any Four of the following:-

**[4×4=16]**

- a) What is short circuit boolean evaluation? How it is useful?
- b) Differentiate between type equivalence and type compatibility?
- c) Explain Remote Procedure call.
- d) What is vtable? How it is used?
- e) What is critical section? What is semaphore? Why semaphore is used?

**Q4)** Attempt any Four of the following:-

**[4×4=16]**

- a) Describe 4 common parameter passing modes with example.
- b) What is dope vector? What are its purposes.
- c) How virtual function can be used to achieve the effect of subroutine closure?
- d) What is monitor? How monitor variables differ from semaphore variables.
- e) Describe static chain and displays in detail.

**Q5)** Attempt any Four of the following:-

**[4×4=16]**

- a) What is backtracking in prolog?
- b) Give 4 differences between C and prolog.
- c) Write a recursive LISP function to return power,  $x^y$ , where x and y are passed as arguments.
- d) Write a LISP function for finding intersection of 2 lists.
- e) Write a prolog program to find a factorial of given number.

✓ ✓ ✓

Total No. of Questions : 4]

SEAT No. :

**P3261**

[5037]-12

[Total No. of Pages : 2

**M.Sc.**

**COMPUTER SCIENCE**

**CS-102:Object Oriented Software Engineering**

**( 2008 Pattern) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

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

**Q1)** Attempt the following.

**[8×2=16]**

- a) Explain any two advantages of UML.
- b) What do you mean by Join and fork?
- c) What is grouping things?
- d) What do you mean by link attribute?
- e) What is mean by stereotypes?
- f) Explain common uses of activity diagram.
- g) Define component. Enlist various types of comopnents.
- h) What is mean by object oriented testing?

**Q2)** Attempt any FOUR of the following.

**[4×4=16]**

- a) Discuss the components of collabration diagram with suitable examples.
- b) What is UML? Explain different views in UML.
- c) Explain object design process in details.
- d) Differentiate between Genralization and aggregation.
- e) What is Rational unified process? Explain features of Rational unified process.

**Q3)** Attempt any four of the following.

**[4×8=32]**

- a) Prepare object diagram at least 7 relationship among the following object classes. Show multiplicity and add at least one attribute to each object class. File directory, file system, disk, drive, ASCIC file, sector, track,executable file.

**P.T.O.**

- b) Consider an Automatic water level system which is used for controlling water flow. Identify the different states and draw a state transition diagram and activity diagram.
- c) The customer wants to buy some of the products by the self service machine. First of all he / she inserts money into the machine select one or more products and Machine present a selected product to the customer. It is possible that self service machine has out one or more product or machine does not have the exact amount of money to return the customer. When the customer inserts money into machine and enters his/her selection. After this machine is out of brand in this case message to customer that machine is out of brand and make another selection or money return back. If incorrect amount of money then self service machine is suppose to return original amount to the customer. A supplier has to restock the machine and collect accumulated money from the machine consider the above case and draw use case diagram and sequence diagram.
- d) Draw class diagram for Hospital management. System consider various classes. Define appropriate attribute, relationship and multiplicity.
- e) Draw component and Reloyment diagram for Email System.

**Q4)** Attempt any FOUR of the following: **[4×4=16]**

- a) Draw the class diagram for both stack and queue implementation using Linked list.
- b) What do you mean by Iteraction diagram? Explain the types of interaction diagram.
- c) Explain the phases in Iterative object oriented development.
- d) What is recuerssion? Explain recursive aggregation with example.
- e) What do you mean by Relationship? Explain two kinds of relationships.



Total No. of Questions : 4]

SEAT No. :

**P3262**

**[5037]-13**

[Total No. of Pages : 5

**M.Sc.**

**COMPUTER SCIENCE**

**CS11- 103 : Distributed Database Concepts  
(2008 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

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

**Q1)** Answer the following:

**[8 × 2 = 16]**

- a) State the characteristics which decide architectural structure of Distributed DBMS.
- b) Define:
  - i) Linear tree
  - ii) Bushy tree
- c) Draw a diagram showing the layered structure of query processor.
- d) Explain the rules of the following protocols
  - i) Wait - die
  - ii) Wound - wait
- e) List different types of failures that can occur in Distributed DBMS.
- f) What are the modules of Query Decomposition.
- g) With a proper diagram show the messages transferred during execution of 2-phase commit protocol.
- h) Explain in brief 2 types of horizontal fragmentation.

**P.T.O.**

**Q2)** Answer any 4.

**[4 × 5 = 20]**

- a) Explain in brief any 5 problem areas of Distributed DBMS.
- b) State correctness rules of fragmentation.  
Explain whether horizontal fragmentation satisfies these rules.
- c) Explain query optimizer of Distributed DBMS.
- d) Explain Primary copy 2-phase locking protocol.
- e) If local Recovery manager (LRM) is implementing No-fix/flush decision, what actions LRM needs to take during execution of the following commands
  - i) abort
  - ii) commit
  - iii) recover

**Q3)** Solve any four of the following:

**[4 × 6 = 24]**

- a) Consider the following global schema Employee (e.no, e-name, desg, d-no) Dept (d.no, d-name, budget)

The following is the fragmentation schema for the above relations.

$$Dept_1 = \sigma_{budget > 10,00,000}(Dept)$$

$$Dept_2 = \sigma_{budget \leq 10,00,000}(Dept)$$

$$Employee_1 = Employee \bowtie Dept_1$$

$$Employee_2 = Employee \bowtie Dept_2$$

Draw an operator tree for the following query

Select e-name

from employee, Dept

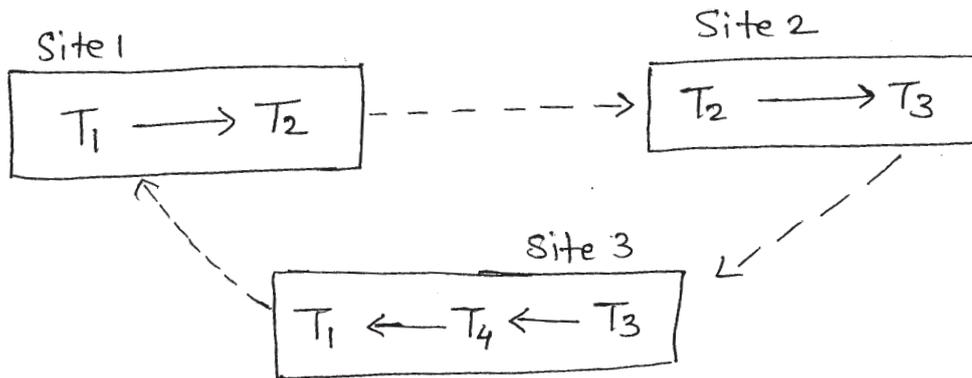
where desg = " Manager"

and budget = 15,00,000

and employee .duo = Dept. duo

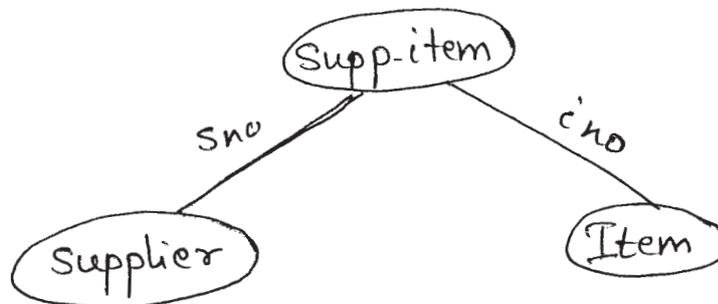
Transform the operator tree to generic tree & to reduced tree. Show all steps of transformation and specify the transformation rules.

b) Consider the following DWFG. at 3 sites



Detect the deadlock, if any, using Distributed deadlock detection algorithm.

c) Consider the following join graph



Supplier is stored at site S1

Item is stored at site S2

Supp-item is stored at site S3

Size (Supplier) = 200 Size (Supplier  $\bowtie$  Supp-tem) = 500

Size (Item) = 150 Size (Item  $\bowtie$  Supp-item) = 400

Size (Supp-item) = 400

The query needs to take the join of all three relations. Find out all possible ways in which query can be evaluated and find out cost of evaluation for each possibility.

- d) Consider a data item x.

$$RTS(x) = 10 \text{ and } WTS(x) = 8$$

Let the pairs  $\langle Ri(x), TS \rangle$  and  $\langle Wi(x), TS \rangle$  denote a read and write request respectively of a transaction  $T_i$  on data item x with time stamp  $T_s$ .

What will be the behaviour of basic time stamp ordering protocol for the following set of request?

$$\langle R_1(x), 12 \rangle, \langle R_2(x), 11 \rangle, \langle R_3(x), 15 \rangle$$

$$\langle W_1(x), 12 \rangle, \langle W_4(x), 18 \rangle, \langle W_5(x), 20 \rangle$$

$$\langle R_6(x), 19 \rangle, \langle R_7(x), 21 \rangle$$

- e) Apply INGRES algorithm to the following query and show how detachments and substitution will be applied to get monorelational queries

Select ename, pname

from emp, asg, proj

where asg. dur > 12

and emp.eno = asg. eno

and proj. pno = asg. pno

**Q4)** Attempt any 4

**[4 × 5 = 20]**

- a) Write note on

Client server Architecture of Distributed DBMS.

- b) State all 8 characteristics of query processor and explain any 3 characteristics in brief.

- c) Define

- i) Type incorrect query

- ii) Semantically incorrect query
  - iii) Genetic query
  - iv) Operator tree
  - v) Conjunctive normal form
- d) Based on “Organization of read/write operations”, what are different types of transaction?
- e) With proper state transition diagram explain how coordinator handles various time out situations during the execution of transaction in distributed environment.



Total No. of Questions :4]

SEAT No. :

[Total No. of Pages :4

**P3263**

**[5037] - 14**

**M.Sc.**

**COMPUTER SCIENCE**

**CS - 104 : Design and Analysis of Algorithms**

**(2011 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

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

**Q1)** Attempt all of the following

**[8×2=16]**

- a) Define  $\Omega$  notation.
- b) What are the steps of Divide & conquer paradigm.
- c) Is the solution obtained by Greed method is always optimal? Justify.
- d) What is Hamiltonian cycles.
- e) Is relaxation technique increases shortest path cost.
- f) Define satisfiability problem.
- g) Define articulation point & bridge edge.
- h) What is cook's theorem?

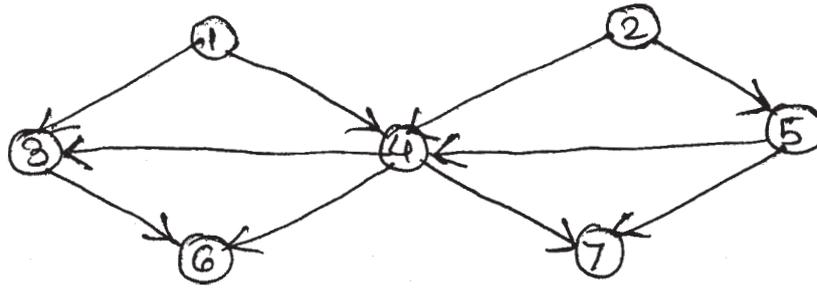
**Q2)** Attempt any four of the following.

**[4×5=20]**

- a) Explain 8 - queen's problem & state the explicit & implicit constraints of 8 - queen's problem.

***P.T.O.***

- b) What is topological sort? Show the ordering of vertices produced by topological sort on the following diagram (start with vertex  $V_1$ )



- c) Write pseudo code for merge sort? What is its time complexity.
- d) Explain the string editing problem. Give the recurrence relation for the value of the optimal solution when the problem is to be solved using Dynamic programming.
- e) Find the optimal solution to the knapsack instance  $n = 7$  &  $m = 15$   
 $(P_1, P_2, P_3, P_4, \dots, P_7) = (10, 5, 15, 7, 6, 18, 3)$   
 $(w_1, w_2, w_3, w_4, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$   
 using Greedy method.

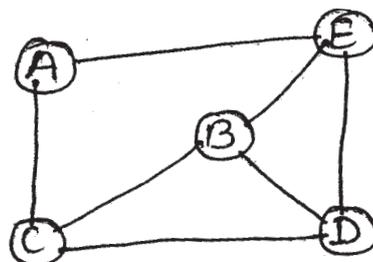
**Q3)** Attempt any four of the following

**[4×5=20]**

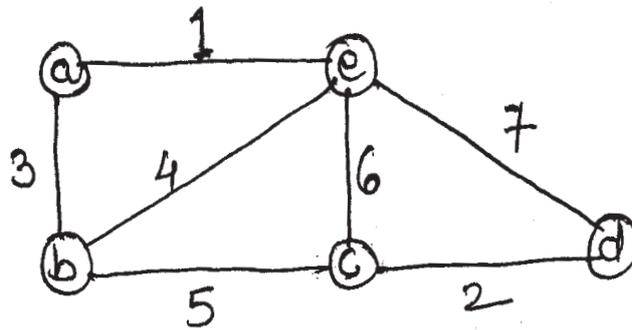
- a) Explain Bell - man ford algorithm. What is its time complexity.
- b) Use strassen's algorithm, to compute the matrix product of following matrix giving each computational step.

$$A = \begin{bmatrix} 3 & 2 \\ 2 & 8 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 5 \\ 9 & 6 \end{bmatrix}$$

- c) What is m - colorability graph problem? Find out all possible solutions with exactly 4 color for following graph.



- d) Apply Kruskal's algorithm to obtain minimum spanning tree for the following graph.



- e) Write a non-deterministic algorithm for maximum clique Decision problem.  
 f) State the Greedy algorithm for optimal binary merge pattern & find one for eight files whose lengths are 28, 32, 12, 5, 48, 13, 35, 11

**Q4)** Attempt any four of the following

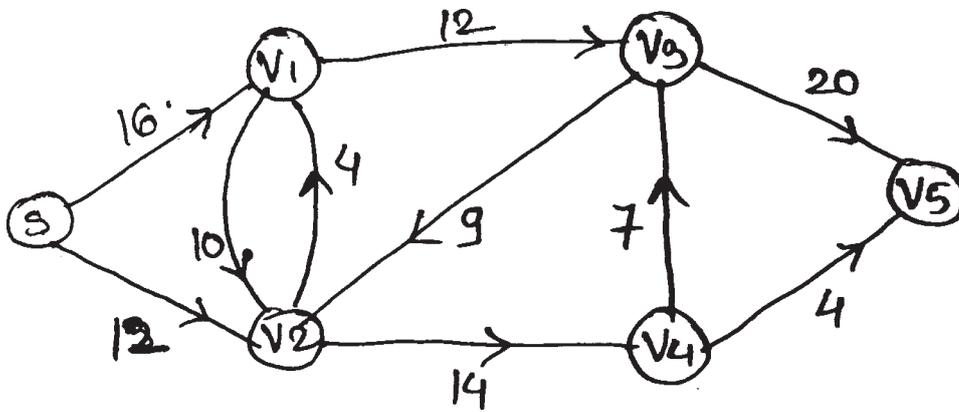
**[4×6=24]**

- a) Solve the given instance of TSP - Travelling salesperson problem by using LCBB method.

$$\begin{bmatrix} \infty & 10 & 15 & 20 \\ 5 & \infty & 9 & 10 \\ 6 & 13 & \infty & 12 \\ 8 & 8 & 9 & \infty \end{bmatrix}$$

- b) Compare Depth first search & Breadth First search. Which method uses Backtracking.  
 c) What is the best way to multiply a chain of matrices with dimensions that are  $10 \times 5$ ,  $5 \times 2$ ,  $2 \times 20$ ,  $20 \times 12$ ,  $12 \times 4$  &  $4 \times 60$  using Dynamic programming.  
 d) Write an algorithm to solve the puzzle Tower of Hanoi.  
 e) What is an Algorithm? State the characteristics of a good algorithm? What is space complexity? & time complexity.

f) Find maximum flow of the given network.



Total No. of Questions :5]

SEAT No. :

**P3264**

**[5037]-21**

[Total No. of Pages :2

**M.Sc**

**COMPUTER SCIENCE**

**CS - 201: Advanced Networking Concepts  
(2008 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

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

**Q1)** Attempt all of the following:

**[8×2=16]**

- a) Which are multiple timers used in TCP?
- b) Discuss the problems of X.25 WAN.
- c) Justify: IP is best delivery protocol
- d) Define the role of relay agent in BOOTP.
- e) What is AAL? In which layer it is used?
- f) Define out of band signaling.
- g) What is remote procedure call?
- h) Define marshaling.

**Q2)** Attempt any four of the following:

**[4×4=16]**

- a) Explain H.323 architecture and its protocols.
- b) Explain Tomlinson's solution for Transport connection establishment.
- c) Explain how TCP controls the congestion.
- d) Discuss the architecture of ATM networks.
- e) Explain all headers used in HTTP.

**P.T.O.**

**Q3)** Attempt any four of the following:

**[4×4=16]**

- a) Discuss various options used by DHCP.
- b) Explain various UDP applications.
- c) Explain architecture of frame relay and its need.
- d) Explain SNMP in detail.
- e) Compare headers of IPv4 & IPv6 datagrams.

**Q4)** Attempt any four of the following:

**[4×4=16]**

- a) Explain RIP in detail
- b) Explain in detail various forwarding techniques.
- c) Discuss with example dynamic buffer allocation in transport layer.
- d) What are the types of BGP sessions? Explain types of packets used in BGP.
- e) Differentiate between transport layer and data link layer.

**Q5)** Attempt any four of the following:

**[4×4=16]**

- a) Discuss socket primitives used for TCP.
- b) Explain how caching speeds up the operation of DNS? Which technique is used by server to avoid sending outdated mapping?
- c) Compare distance vector routing and link state routing.
- d) Show with an example of downloading of email by using POP3.
- e) Explain any two approaches used in streaming stored audio/video.



Total No. of Questions :5]

SEAT No. :

**P3265**

**[5037]-22**

[Total No. of Pages :4

**M.Sc.**

**COMPUTER SCIENCE**

**CS-202: Unix Internals**

**(2008 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

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

**Q1)** Attempt all of the following:

**[8×2=16]**

- a) Explain syntax and usage of kill system call.
- b) What is callout table?
- c) Is it necessary to maintain incore inode? What would happen if it is not maintained?
- d) List any four functions of clock inetrrupt handler.
- e) When does the kernel check for a receipt of a signal?
- f) The U area of a process contains the fields that must always be accessible to the kernel even if the process is not running. Comment and Justify.
- g) Consider following program segment  
fd = open("file 123. txt", ORDONLY);  
Close (0);  
fd1 = dup (fd);  
What will be the values of fd and fd1?
- h) "Inode locking and unlocking mechanism is depends on system call and not on closing the file", Comment.

**P.T.O.**

**Q2)** State whether the following statements are true or false. Justify your answer  
**[4×4=16]**

- a) The number of context layer is bounded by the number of interrupt levels supported by the machine.
- b) Zombie processes and processes locked in memory do not get swapped out.
- c) A process may increase or decrease the size of its data region by using setpgrp system call.
- d) The kernel writes the newly allocated inode to disk before it writes the directory with the new name to disk while creating a file.
- e) In the link system call, the kernel must release the source file's inode after incrementing it's link count.

**Q3)** Attempt any four of the following: **[4×4=16]**

- a) Explain any two time related system calls with example?
- b) Explain the structure of buffer pool.
- c) Explain the logical format of executable file.
- d) In the block ahead algorithm, when I/O of second block is completed, kernel releases the buffer allocated to the block. Why? What is the advantage of block read ahead?
- e) Give the steps that kernel follow to open a device.

**Q4)** Attempt any four of the following:

**[4×4=16]**

- a) Write a C program which polls a terminal.
- b) Explain the behaviour of program.

```
main ()
{
    char * endpt;

    char * sbrk ();

    int brk ();

    entpt = sbrk(0);

    printf (“ endpt= %u after sbrk \n”, (int) endpt);

    while (endpt --)
    {
        if (brk (endpt) == -1)
        {
            printf(“ endpt =%u after sbrk \n”, (int)endpt);
            while (endpt--)
            {
                if (brk(endpt) == -1)
                {
                    printf( “brk of %u failed\n”, endpt);
                    exit(0);
                }
            }
        }
    }
}
```

- c) Write C program which will take directory name and file name as command line arguments and check whether the file is present in the specified directory.

- d) Write a C program in which parent process will write unnamed pipe and will read from it.
- e) What is the purpose of the following program? Explain its behavior.

```
# include <stdio.h>
# include <fcntl.h>
main(int argc, char * argv)
{
    fd = open(argv[1], O_CREAT/O_WRONLY,0600);
    dup2(fd,1);
    close(fd);
    execlp(argv[2], argv[2], NULL);
    Perror(main);
}
```

**Q5)** Attempt any four of the following:

**[4×4=16]**

- a) Explain wakeup algorithm in detail.
- b) What do you mean by process sleeping at interruptible priority? What is sleep address?
- c) Explain the various fields of process table.
- d) Explain the components of system level context.
- e) Explain the block diagram of system kernel.



Total No. of Questions :5]

SEAT No. :

[Total No. of Pages :3

**P3266**

**[5037]-23**

**M.Sc. - I**

**COMPUTER SCIENCE**

**CS-203: Software Architecture**

**(2008 Pattern) (Semester - II)**

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn whenever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

**Q1)** Attempt all of the following:

**[8×2=16]**

- a) List the phases in unified process.
- b) Give elements of Design pattern.
- c) What make s a pattern?
- d) Define term module.
- e) What are the advantages of components?
- f) What do you mean by web application?
- g) Give benefits of iterative development life cycle.
- h) Define - component.

**P.T.O.**

**Q2)** Attempt any four of the following:

**[4×4=16]**

- a) Explain module based Architectural structures.
- b) What are the categories of pattern?
- c) Write short note on layered system architectural style.
- d) Explain Advantages of component based development.
- e) How pattern meets the objectives of software architecture?

**Q3)** Attempt any four of the following:

**[4×4=16]**

- a) Explain high cohesion GRASP with the help of suitable example.
- b) Give structure and participants of Adapter design pattern.
- c) What are the participants of decorator design pattern.
- d) Give intent and applicability of factory method design pattern.
- e) Give structure and participants of Iterator design pattern.

**Q4)** Attempt any four of the following:

**[4×4=16]**

- a) Give structure and participants of observer design pattern.
- b) Write short note on MVC model.
- c) Give different characteristics of framework.
- d) Define cohesion. What are the types of cohesion?
- e) What is Heterogeneous Architectures?

**Q5)** Attempt any four of the following:

**[4×4=16]**

- a) Write short note on strats framework?
- b) What are the advantages of components?
- c) Give participants and collaboration in proxy design pattern.
- d) Differentiate - code reuse Vs. Component reuse.
- e) Give critical unified process practices.

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Total No. of Questions :5]

SEAT No. :

**P3267**

**[5037]-31**

[Total No. of Pages : 2

**M.Sc.**

**COMPUTER SCIENCE**

**CS23-301 : Software Metrics and Project Management  
(2008 Pattern) (Semester-III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

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

**Q1)** Attempt the following:

**[8×2=16]**

- a) What is the definition of Project Management according to ISO?
- b) Define:-
  - i) BCWP (Budgeted Cost Work Performed)
  - ii) ACWP (Actual Cost Work Performed)
- c) List the different aspects of structure in measuring internal product attributes of software metrics.
- d) List the processes used in Human Resource Management.
- e) What is metric plan?
- f) Define:-
  - i) Risk Event
  - ii) Risk Symptom
- g) Define :-
  - i) Measurement
  - ii) Failure
- h) State the importance of Delphi method in Project Risk Management.

**Q2)** Attempt any Four of the following:-

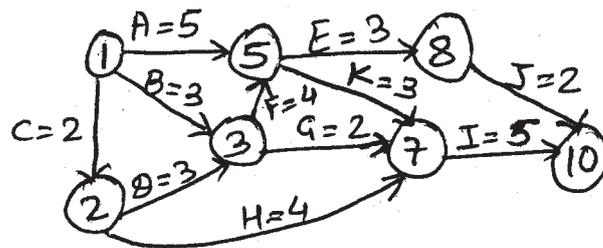
**[4×4=16]**

- a) Explain the main processes involved in Project Integration Management.
- b) Explain McCall's software quality model in detail.
- c) What are the outputs of the Project Risk Response development?
- d) What are the main types of contract if you decide to outsource?
- e) What are the different types of power used in Human Resource Management?

**P.T.O.**

- Q3) Attempt any Four of the following:-** **[4×4=16]**
- Write a short note on cost budgeting?
  - Explain the tools and techniques of schedule development process of Project Time Management.
  - Explain any four activities involved in software measurement.
  - Write a short note on scope statement?
  - Explain in brief reliability growth problem.

- Q4) Attempt any Four of the following:-** **[4×4=16]**
- What is CMM? Explain all the phases used in CMM model.
  - Write a short note on GQM Framework?
  - Explain five basic modes in handling conflicts in Communication Management.
  - What are the three main outputs of quality control process?
  - Define critical path in Time Management. Also, Determine the critical path for the following:-



- Q5) Attempt any Four of the following:-** **[4×4=16]**
- Explain in brief tools and techniques used to improve productivity.
  - Draw the Work Break Down structure (WBS) for Library Management System.
  - Differentiate between the project, matrix and functional organizational structure.
  - Explain the why and what of metrics plan?
  - How change control board are used in IT projects?

✓   ✓   ✓

Total No. of Questions : 5]

SEAT No. :

[Total No. of Pages : 2

**P3268**

**[5037]-32**

**M.Sc.**

**COMPUTER SCIENCE**

**CS. 23-302:Mobile Computing**

**( 2008 Pattern) (Semester-III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

**Instruction:**

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

**Q1)** Attempt all of the following.

**[8×2=16]**

- a) What is the difference between CLDC & CDC?
- b) What is meant by roaming in GSM?
- c) Give examples of the following communication devices
  - i) Mobile and wired
  - ii) Mobile and wireless
  - iii) Fixed and wired
  - iv) Fixed and wireless
- d) What are advantages of FHSS over DSSS?
- e) Define the terms tunneling and encapsulation.
- f) Write two features of coda file system.
- g) What is persistent storage?
- h) What is Fast recovery/ fast retransmit in mobile transport layer?

**Q2)** Attempt any four of the following.

**[4×4=16]**

- a) What are goals of mobile IP? explain mobile IP requirements.
- b) How GPRS implements different Quality of services?

**P.T.O.**

- c) Why CSMA/CD fails in wireless networks?
- d) Write a short note on cellular system.
- e) What is the reaction of standard TCP in case of packet loss? why is it quite often problematic in the case of wireless network and mobility?

**Q3) Attempt any four of the following. [4×4=16]**

- a) Write a short note on radio subsystem of GSM.
- b) Explain the architecture of WAP.
- c) What is inefficient triangular routing behaviour? How to solve this problem in mobile IP?
- d) Write a short note on Network MID lets?
- e) Compare proactive protocols and reactive protocols in mobile ad-hoc networks.

**Q4) Attempt any four of the following. [4×4=16]**

- a) What are built-in mechanisms for mobility in IPV6?
- b) What are similarities and differences in tasks performed by foreign agent in I-TCP and snooping TCP?
- c) What are different types of operating systems used for mobile devices?
- d) Explain logical model underlying WAE.
- e) Explain the short messaging service architecture.

**Q5) Attempt any four of the following. [4×4=16]**

- a) Explain the importance of care-of Address (COA) in the process of IP packet delivery in mobile IP.
- b) How localization is achieved in GSM?
- c) What constraints are possible on Text Box in JZME.
- d) What are benefits of using reservation schemes in MAC layer? Explain any one wireless MAC reservation scheme.
- e) What are the features of WML?



Total No. of Questions : 5]

SEAT No. :

**P3269**

**[5037]-33**

[Total No. of Pages : 2

**M.Sc.**

**COMPUTER SCIENCE**

**CS - 23 - 303 : Information System Security  
(2008 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *Attempt all questions.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*

**Q1)** Attempt all of the following:

**[8 × 2 = 16]**

- a) List the step used in output transformation of IDEA.
- b) List out different substitution techniques used for encryption.
- c) What are the different services given by PKI infrastructure?
- d) What is steganography?
- e) Give the advantages of IPSec.
- f) What is mean by confidentiality in case of security?
- g) Discuss Padding step used in MD5.
- h) Define the term Firewall.

**Q2)** Attempt any four of the following:

**[4 × 4 = 16]**

- a) Discuss encryption and decryption process in Output feedback mode.
- b) How does the one time initialisation step works in AES?
- c) Differentiate between OCSP and SCVP.
- d) Explain the concept of Electronic money with its type .
- e) Explain in brief how SSL works.

**P.T.O.**

**Q3)** Attempt any four of the following:

**[4 × 4 = 16]**

- a) Write a note on secure electronic transaction.
- b) Explain the concept of VPN.
- c) Consider  $n = 5$ ,  $g = 11$ , Apply Diffie Hellman algorithm to generate keys  $K_1$  and  $K_2$ .
- d) Discuss in brief SHA Message Integration techniques.
- e) How does PGP works? Explain in brief.

**Q4)** Attempt any four of the following:

**[4 × 4 = 16]**

- a) Produce the cipher text by using simple columnar transposition technique. Consider the plain text “COME TO COLLEGE IN TIME”, Number of rounds = 2 and keys are as follows:

Round Number	order of columns
1	6,3,4,5,2,1
2	1,2,3,4,5,6

- b) Explain the working of DES (Data Encryption Standard).
- c) Write down various steps of Time Stamping Protocol.
- d) How to verify a digital certificate?
- e) Explain SET Process.

**Q5)** Attempt any four of the following:

**[4 × 4 = 16]**

- a) Consider the given two prime numbers  $P = 13$  and  $Q = 7$ . Find  $N$ ,  $E$  and  $D$  using RSA algorithm.
- b) Explain the overview of 3D - secure protocol.
- c) Give overview of MIME and also write functionality Provided by S/ MIME.
- d) Write a note on Network viruses. Describe WORM in detail.
- e) Discuss how encryption happened in RC 5.

