Total No. of Questions : 5] **[Total No. of Pages : 3**

P 959

[3933] - 101
M.Sc.
COMPUTER SCIENCE
CS - 11 - 101 : Principles of Programming Languages
(Old &New) (Sem. - 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) ***Assume suitable data, if necessary.***
5) ***All questions carry equal marks.***

Q1) Attempt all : **[8 × 2 =16]**

a) What are LET and LET *forms in LISP.

b) Define Applicative and Normal order evaluation.

c) What is a cactus stack?

d) Define PROLOG Variable. State various types.

e) Define Name overloading and Name aliase.

f) What is conditional critical Region?

g) What is a Type system?

h) Define Opaque Type.

Q2) Attempt any Four : **[4 × 4 =16]**

a) Describe declarative and imperative languages with their important subclasses.

b) Explain fragmentation? State the storage allocation method suffering from it.

c) Explain calling sequence.

P.T.O.

d) Represent the Implementation of the following virtual methods with single inheritance.

```
Class first                          Class second : public first
{                                    {
    int a;                               int d;
    double b;                            public :
    Char c;
    public:                              void r ( ) ;
    Virtual void p ( ....                Virtual double t ( ...
    Virtual int q ( ....                 Virtual char * u ( ....
    Virtual void r ( ) ;             } S;
    Virtual double s ( ....
} F;
```

e) Define :

i) Memoization

ii) Tail recursive function

iii) Coercion

iv) Dope vector

Q3) Attempt any Four : **[4 × 4 =16]**

a) Explain symbol table.

b) Describe "with" statement in PASCAL with suitable example.

c) State and explain the mechanisms that allow a computer to perform repetition

d) Differentiate semaphore and Monitor.

e) i) What is scope resolution operator?

ii) What is a Display?

Q4) Attempt any Four : **[4 × 4 =16]**

a) Explain special purpose parameters.

b) Discuss any two common uses of goto and how to convert them into structured flow.

c) Implement the given array using row pointers as well as contiguous array allocation on 32 - bit machine.

i) Char name [ ] [10] = { “Smita”, “Sanket”, “Shri”, Shreyas”, Sundaram”};

ii) Char * name [ ] = { “Smita”, “Sanket”, “Shri”, “Shreyas”, “Sundaram”};

d) Define thread. Discuss any three thread creation syntax.

e) Explain visibility rules in C + +.

Q5) Attempt any Four : **[4 × 4 =16]**

a) Define property list in LISP. Explain it with its access procedures.

b) Write a LISP function no-of-occur with two arguments: an element and a list, which returns the number of occurrences of a given element in a given list.

eg.(no-of-occur ‘a’ (a b a c a d)) $\xrightarrow{o/p}$ 3

c) Explain the process of unification.

d) Write a PROLOG program to reverse a given list.
eg. [a b c d e] $\xrightarrow{o/p}$ [e d c b a]

e) Write a PROLOG program to prove that “g1 and g2 are the grand parents of S and p2 is the mother of S” -if
- g2 is a mother of p1.
- g1 is a father of p1.
- p1 is a father of S.
- p2 is a wife of p1.

■ ■ ■

Total No. of Questions : 4] **[Total No. of Pages : 2**

P 960

[3933] - 102
M.Sc. - I
COMPUTER SCIENCE
CS-11-102 :Object Oriented Software Engineering
(Old & New) (Sem. - I)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates :

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

Q1) Attempt all of the following : **[8 × 2 =16]**

a) How to define attributes in an object model?

b) What are the differences between classes and use cases?

c) Explain structural things.

d) Which diagrams provide a dynamic view of a system?

e) What is realization?

f) Explain benefits of iterative development.

g) Write three different kinds of component.

h) What is Beta testing?

Q2) Attempt any four of the following : **[4 × 4 =16]**

a) How to finalize the object definition?

b) Discuss qualified association and qualifiers.

c) Write note on Inception and requirement understanding.

d) Discuss the components of use case diagram.

e) What is importance of system design?

P.T.O.

Q3) Attempt any four of the following : **[4 × 8 = 32]**

a) Prepare object diagram showing at least 7 relationships among the following object classes. Include associations, aggregations and generalization. Show multiplicity. You can add additional attributes it necessary. Add atleast one attribute to each class. Person, Car, Owner, Loan, Company, Bank.

b) Draw component and deployment diagram for "University examination system".

c) A Blood Bank centre is in the heart of the city having a good reputation and so enjoys a continuous service day and night. At the front counter details on stock status of blood, issue details and information about donors is readily made available to anxious relatives as and when they require. The donors donate in another section of the center-section D. The blood is collected in one-liter bottles, which are sent to the laboratory for investigation. After various tests, the blood is either accepted or discarded. These bottles are then sealed and sent for proper storage to another section.

Inventory of different blood group type is maintained. If bottle reach a minimum pre-defined level, a replacement order is made and sent to section D then the various donors are contacted from a donor dabase for immediate action. New donors too are accepted regularly. Each donor is given an identify card. Model the above system and draw the class diagram.

d) Draw Activity and state diagram for the process of creating a document.

e) Draw sequence diagram for the GUI interaction with other objects.

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

a) Explain object oriented testing strategy.

b) Write note a object modeling Technique on Raumbaugh method.

c) Draw a collaboration diagram for 'Loan Banking System'.

d) Draw a Activity diagram for Thump punching machine.

e) Explain generalization by giving suitable example.

■ ■ ■

Total No. of Questions : 4] **[Total No. of Pages : 4**

P961

[3933]-103
M.Sc.
COMPUTER SCIENCE
CS-11 - 103 : ADVANCED DATA BASE CONCEPTS
Distributed Database Concepts
(Sem. - I) (Old & New)

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) ***Make necessary assumptions.***

Q1) Answer the following : **[8 × 2 = 16]**

a) State the different promises of DDB.

b) Distributed data processing uses divide and conquer method Justify true or false.

c) List the areas of distributed system where heterogeneity may occur.

d) Explain the types of heuristic approaches for vertical fragmentation of global relation.

e) State the objectives of query processing.

f) Differentiate between Reliability and Availability.

g) Write a short on the ways, concurrency control approaches can be classified.

h) What is meant by Non-repeatable or Fuzzy read.

Q2) Attempt <u>any four</u> : **[4 × 5 = 20]**

a) Explain the variations of 2Pc. Which have been proposed to improve its performance.

b) Write a note on multiversion Timestamp ordering algorithm.

c) Discuss the characteristics of query processor. Which are peculiar to distributed environment.

d) What are information requirements during allocation.

e) Explain the types of failures in DDBMS.

P.T.O.

Q3) Attempt <u>any four</u> : **[4 × 6 = 24]**

a) Apply INGRES algorithm to following query and illustrate the successive detachments and substitutions by giving the monorelation subqueries generated:-

```
SELECT   ename, pname
FROM     EMP, ASG, PROJ
WHERE    duration > 12
         and EMP. eno = ASG - eno
         and (title = "Elect. Eng" or ASG. Pno < "P3")
         and ASG. pno = PROJ - pno
```

b) Let $Q = \{q_1, q_2, q_3, q_4, q_5,\}$ be the set of queries.
$A = \{A_1, A_2, A_3, A_4, A_5\}$ be the set of attributes.
$S = \{S_1, S_2, S_3,\}$ be the set of sites.

Matrix (a) describes attribute usage values and matrix (b) gives application access frequencies. Assume that ref ; $(q_k) = 1 \ \forall q_k$ and si, and that A_4 is the key attribute. Use Bond Energy and vertical partitioning algorithms to obtain vertical fragments of set of attributes in A.

Matrix (a)

	A_1	A_2	A_3	A_4	A_5
q_1	0	1	1	1	0
q_2	1	1	1	0	0
q_3	1	1	0	0	0
q_4	0	0	0	1	1
q_5	0	0	1	1	1

Matrix (b)

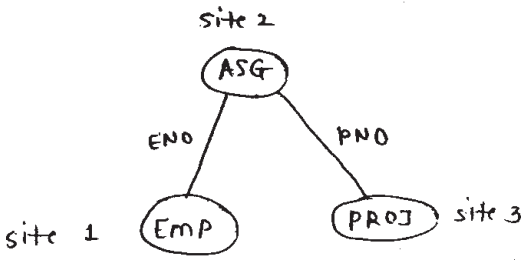
	S_1	S_2	S_3
q_1	20	4	0
q_2	25	10	0
q_3	15	0	0
q_4	0	0	30
q_5	0	20	25

c) Consider following query:-

```
SELECT  ename, salary
FROM    EMP, PROJ, ASG, PAY
WHERE   EMP. eno = ASG. eno
        and EMP. Title = Pay. Title
        and (budget > 2000000 or dur > 24)
        and ASG. Pno = PROJ. Pno
```

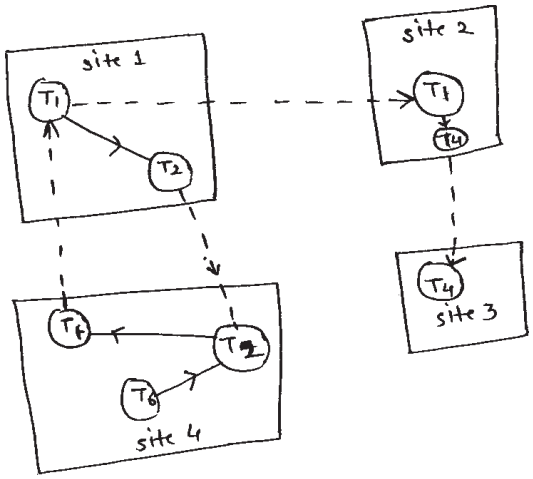
compose the selection predicate corresponding to the WHERE clause. And transform it, using idempotency rules into its simplest form.
Furthermore, compose an operator tree corresponding to query and transform it, using relational algebra transformation rules to a form that is optimal with respect to total execution time by considering only selectivity factors of operations.

d) consider the following join graph.



Let size (EMP) = 100, size (ASG) = 200, size (PROJ) = 300, size (EMP ⋈ ASG) = 300, Size (ASG ⋈ PROJ) = 200
Assume that a query needs to access all the relations. Write all possible ways, in which a query can be executed, along with total data transmission cost for each way.

e) Consider the following DWFG given below :



Detect the deadlock and state which transactions are the part of cycle and which transactions are deadlocked;

Q4) Attempt <u>any four</u> : **[4 × 5 = 20]**

a) Explain the role of Autonomy factor in DDBMS implementation alternative.

b) Write a note on following LRM algorithms :

(i) No - fix / No - flush

(ii) No - fix / Flush

c) Discuss the Deadlock Avoidance scheme used in DDBMS.

d) Describe consistency property of a transaction, along with classification of consistency.

e) Explain communication structure of Distributed 2PL with the help of diagram.

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Total No. of Questions : 4] **[Total No. of Pages : 3**

P 962

[3933]-104
M.Sc.
COMPUTER SCIENCE
CS11 - 104 : Design and Analysis of Algorithms (Old and New) (Sem. - 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) ***Assume suitable data, if necessary.***

Q1) Attempt all of the following: **[8 × 2 = 16]**

a) Why bounding functions are useful in the context of branch and bound?

b) Define principle of optimality. State use of optimality in greedy method and dynamic programming.

c) Define O notation. Is $3n + 2 = O(n)$ justify.

d) Greedy strategy may not always yield optimal solution. Justify.

e) Define articulation point and bridge edge.

f) What are strongly connected components?

g) Backtracking is a breadth first search for solution. Justify.

h) What are Np-hard and Np-complete problems?

Q2) Attempt <u>any four</u> of the following : **[4 × 5 = 20]**

a) Find an optimal solution to the knapsack problem instance

$n = 4$, $m = 25$ $w = (15, 20, 21, 18)$ $p = (15, 22, 20, 17)$.

b) Order the following functions in ascending order of their growth rates and justify, n^3 logn, n logn, $20n^2$, z^n, logn.

c) What is longest common subsequence problem? Show that it satisfies optimal substructure property. Give the algorithm based on dynamic programming to compute length of LCS.

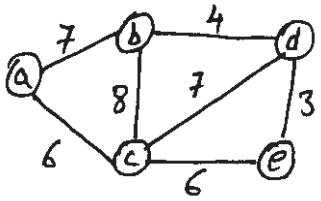
P.T.O.

d) Write the Bellman -Ford algorithm. Explain its time complexity.

e) Consider the following instance for job sequencing with deadlines problem where n = 7 $(p_1, p_2, ...p_7) = (12,13,10,7,18,6,12)$
$(d_1, d_2 --- d_7) = (2, 1, 4, 2, 3, 1, 2)$.Give the solution obtained using Greedy strategy.

Q3) Attempt <u>any four</u> of the following : **[4 × 5 = 20]**

a) What is minimum spanning tree? Find minimum spanning tree using prim's and Kruskal's algorithms.



b) Write any two sorting algorithms which are using divide and conquer technique.

c) Explain 8 Queen's problem and give the formulation for explicit and implicit constraints for the same.

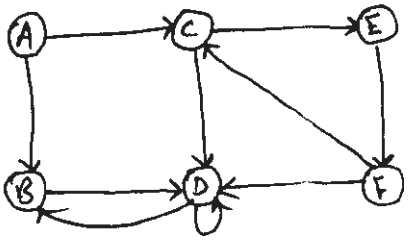
d) Write note on strossen's matrix multiplication.

e) Draw the portion of state space tree generated by LCBB for the knapsack problem instance given by w = (7, 6, 5, 4) p = (15, 10, 12, 13) & m = 15.

Q4) Attempt <u>any four</u> of the following : **[4 × 6 = 24]**

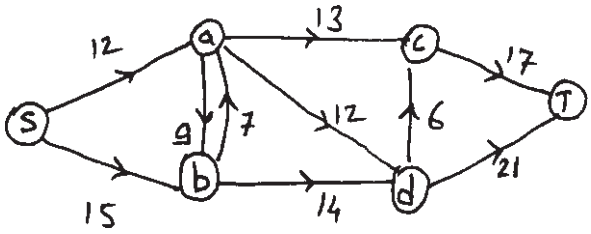
a) Explain string editing problem. Give the recurrence relation for the value of the optimal solution when the problem is to be solved using dynamic programming.

b) Give the algorithm to compute strongly connected components using DFS. Find the strongly connected components for the following graph using above algorithm.



c) Write a non-deterministic algorithm for knapsack problem.

d) Explain the Ford-Flukerson algorithm to find maximum flow. Illustrate the following network where S is the source and T is the sink.



e) What is satisfiability problem? State and explain Cook's theorem.

f) What is Tower of Hanoi problem? Give a recursive algorithm for the problem and find its running time in terms of number of disks n.

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Total No. of Questions : 5] **[Total No. of Pages : 2**

P 963

[3933] - 201
M.Sc. - I
COMPUTER SCIENCE
CS - 201: Advanced Networking Concepts
(Old & New) (Sem. - II)

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.***

Q1) Attempt all of the following : **[8 × 2 = 16]**

a) Define HFC network.

b) What is use of primary and secondary server in DNS?

c) Can the value of the header length in an IP packet be less than 5? When is it exactly 5?

d) What are limitations of RARP?

e) Define split horizon technique.

f) A router running RIP has a routing table with 20 entries. How many periodic timers are needed to handle this table?

g) Define RPC.

h) State the extra Features of IMAP4.

Q2) Attempt any four of the following : **[4 × 4 =16]**

a) With transition diagram explain the options used in DHCP.

b) Explain with example how dynamically transport layer allocates its buffer.

c) Discuss the email message access protocols.

d) Explain the need of Frame relay network. Also discuss its architecture.

e) Discuss any three extension headers used in IPV6.

P.T.O.

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

a) Explain socket interface for connection oriented concurrent server.

b) Discuss Tomlinson's solution for transport connection establishment.

c) A DNS client is looking for the IP addresses corresponding to xxx. yyy.com & aaa. bbb. edu. Show the query message.

d) Explain how TFTP establishes and terminate the connection.

e) List the deficiencies of IPV4 Protocol. How these deficiencies are overcomed in IPV6.

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

a) List RIP shortcomings and their corresponding fixes?

b) How a packet life time is restricted by transport layer?

c) Show and justify the sequence of characters exchanged between the TELNET client and the server to switch from line mode to the character mode.

d) If the transport layer service is so similar to the network layer service, why we require two distinct layers?

e) Discuss the 'Tracking the callee' procedure used in SIP.

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

a) Explain with eg. How shortest path tree is formed by using DIJKSTRA algorithm.

b) Why playback buffer and ordering is required in real time traffic?

c) How crash recovery is handled by transport layer?

d) Explain how SNMP achieves its Management task?

e) What is transparent bridges? Explain the learning process of transparent bridges.

■ ■ ■

Total No. of Questions : 5] **[Total No. of Pages : 3**

P 964

[3933] - 202
M.Sc.
COMPUTER SCIENCE
CS - 202 : Unix Internals
(Sem. - II) (Old & New)

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.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Assume suitable data, if necessary.***

Q1) Attempt all the following : **[8 × 2 =16]**

a) When kernel invokes "validity fault handler" function?

b) Give the differences and similarities between the signal and interrupt.

c) State the significance of carry bit in Ps register.

d) Who takes care of the zombie process in unix"

e) "Kernel never over writes the data in pipe" comment and justify.

f) Give the formula to calculate logical disk block number and byte offset of / in disk block.

g) What actions are taken at the time of closing file for the following cases.

   i) File table count > = 1.

   ii) File table count = 0.

   iii) Inode reference count > = 1.

   iv) Inode reference count = 0.

h) How callout table entries are negative?

P.T.O.

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

a) "Number of context layer is bounded by interrupt layer".

b) "Streams are schemes for improving modularity of device drivers and protocols".

c) "An unnamed pipe is created using first two entries of user file discriptor table".

d) "Lock is set between the system calls & reference count is set across the system call".

e) "When the process access a page that is not part of its working set, it incurs protection page fault".

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

a) For the following sequence of blocks use getblk algorithm to allocate a buffer for a diskblock and explain with neat diagram all scenarios for retrival of buffer. Existing sequence& status is
(21- busy), (62 - busy), (34 - busy), (90 - busy), (17 - busy), (44 - busy), (32 - delayed write), (30 - free), (120 - free).
Request for allocation for block numbers is 44, 67, 88, 120.

b) Explain the anamolies that may arise while mapping the sleep events into addresses.

c) Explain use of callout table to invoke kernel function on real time basis.

d) Why kernel reports error if free list of indoe is empty, but kernel does not report error when free list of buffer is empty.

e) Which are the functions of clock interrupt handler in unix ? Explain in detail kernel & user process profiling.

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

a) Write a psudo code for contex switch.

b) Write C program to read disk data using block and raw interface.

c) What happens in the kernel if you run the following program? Why?

```
main ( )
{
    f ( ) ; g ( ) ;}
    f ( ) { v fork ( ) ;}
    g ( ) {in t blast [100] , i ;
    for (i = 0 ; i < 100 ; i + +)
    blast [i] = i ;
}
```

d) Write a C program which creates 130 k byte shared memory region and attaches it twice to its address space at different virtual addresses.

e) What happens in the kernel if you run the following program? Why?

```
main (argc, argv),
int argc ; char * argv [ ] ;
{
    if (argc ! = 2)
    {print f ("need 1 dir arg\n");
    exit ( ) ;}
    if (chdir (argv [1] = = -1))
    Print f (" % s not a director\n" , argv [1]);
}
```

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

a) What is semaphore? What are elements of semaphore in unix system V? Explain the elements in detail.

b) Explain various relationships between different tables of unix file system.

c) Explain reasons for process suspension in unix?

d) Discuss the cases when kernel saves context of process.

e) Draw and explain process sleeping on events and events mapping to addresses.

■ ■ ■

Total No. of Questions : 5] **[Total No. of Pages : 3**

P 965

[3933] - 203
M.Sc. (Sem. - II)
COMPUTER SCIENCE
CS - 203 : Software Architecture
(Old & New)

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.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Assume suitable data, if necessary.***

Q1) Attempt all of the following : **[8 × 2 =16]**

a) What are the three ways to apply UML?

b) State implications of definition of software Architecture.

c) Define-Architectural styles.

d) What makes a pattern?

e) Give collaboration of Abstract factory Design pattern.

f) How UML defines responsibility?

g) What do you mean by web Application?

h) Define-Component.

Q2) Attempt any four of the following : **[4 × 4 =16]**

a) Give critical unified process practices.

b) "Architecture manifests the earliest set of design decisions". Justify.

c) Write a short note on pipe and filter Architectural style.

d) Discuss Event Based and object oriented organization Architectural style.

e) What are the properties of patterns for software Architecture?

P.T.O.

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

a) Explain applicability and consequences of singleton Design Pattern.

b) Give structure and participants of Adapter Design pattern.

c) Discuss intent, collaboration, and implementation of command Design pattern.

d) Viewers evaluate contestants in a singing competition on voice quality attributes by rating them. Evaluation data updates as more and more viewers evaluate online. The result is displayed in variety of display formats including bar chart, pie chart, and tabular form.

Select the most appropriate design pattern to use to address the problem and how it is applied give an appropriate class diagram containing relevant classes to illustrate use of the pattern.

e) With the help of suitable example, explain creator GRASP.

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

a) Write a short note on controller GRASP.

b) Which are the common forms of coupling?

c) "A framework organizes patterns at a lower level". Justify.

d) What are the duties performed by MVC controller in a web tier application?

e) State and explain the scope of resources define by struts application.

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

a) Differentiate- code reuse vs. Component reuse.

b) "The middle tier of struts framework is often refer to as server". Justify.

c) Write a short note on sitemesh framework.

d) A simple struts application is to be designed, which represent a home page of Traveling Agency which prompts for Booking a Ticket. On clicking booking link page asks for source and destination of journey. When page is submitted an index page displays a list of buses with their details.

Give the struts components one need to create while designing the application.

e) A registration form for online examination contains information such as name, birth date, qualification, mobile number, email address, exam fee etc.

Discuss the basic validators that can be used with above action form.

■ ■ ■

Total No. of Questions : 5] **[Total No. of Pages : 2**

P 966

[3933] - 301
M.Sc. (Sem. - III)
COMPUTER SCIENCE
CS - 301 : Software Metrics & Project Management
(Old &New Course)

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 are the outputs of project Quality Management?

b) What is OBS?

c) Draw the scemantic diagram for conversion of raw data into attribute values.

d) Define - software reliability with an example.

e) What is Risk Identification?

f) What is CCB?

g) Define MTTF & MTBF.

h) What is GQM & State importance of GQM.

Q2) Attempt any four of the following : **[4 × 4 =16]**

a) "Software reliability measurement is a prediction problem" Comment & Justify.

b) Explain solicitation and what is solicitation planning?

c) State the problems involved in cost estimation of information technology project.

d) What are the main outputs of closing project in project integration management?

e) What do you mean by resource loading and resource levelling and provide an example of when you would use each technique?

P.T.O.

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

a) What is Project? Describe its attributes.

b) Explain, cost estimation Tools & Techniques of a project.

c) What are the processes involved in project scope management.

d) State the activities involve in data analysis. Explain sampling and data distribution technique.

e) Briefly explain "How" of Metrics Plan.

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

a) What are different approaches used for developing work Breakdown structure.

b) Explain process involved in communication management.

c) What is project integration management? Explain in brief the methods of selecting project based on particular organization.

d) What are the different aspects of size in measuring internal product attributes of software metrics?

e) Write a note on configuration management.

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

a) Explain AOA and PERT method in Project Time Management.

b) Explain the different Categories of Risk.

c) Explain CMM.

d) "Staff Retention is important policy in software project management" Explain.

e) Define :

i) EVA.

ii) SV.

iii) CV.

iv) CPI.

■ ■ ■

Total No. of Questions : 5] **[Total No. of Pages : 2**

P 967

[3933] - 302
M.Sc.
COMPUTER SCIENCE
CS 23 - 302 : Mobile Computing
(New & Old Course) (Sem. - III)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw figures wherever required.***

Q1) Answer all of the following : **[8 × 2 =16]**

a) List various numbers used in GSM for localization.

b) What are the two modes of reservation ALOHA scheme?

c) How does snooping TCP differ from indirect TCP?

d) What is meant by delay spread?

e) State the purpose of WTP class 0 and class 1 service.

f) What is the purpose of generic routing encapsulation?

g) What is a profile in WAP? List the CLDC profiles.

h) What is the difference between Display and Displayable?

Q2) Attempt any four of the following : **[4 × 4 =16]**

a) Explain the role of various databases used in GSM.

b) What is the goal of mobile IP? Explain the mobile IP Requirements.

c) What are the main reasons for using cellular systems?

How does DCA influence the frequencies in other cells?

d) Slow start decreases the efficiency of TCP if used with mobile nodes. Comment.

e) What is the hidden terminal problem? Explain how MACA solves this problem.

P.T.O.

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

a) Explain the WAP architecture.

b) Explain the mobile originated SMS procedure.

c) What are the inbuilt mechanisms for mobility in IPv6.

d) State the advantages and disadvantages of fast retransmit/fast recovery and selective retransmission.

e) Which operating systems are used in mobile devices? Explain the features of any one.

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

a) Explain the operations offered by push Access protocol.

b) Which characteristics have to be considered while deploying TCP applications over 2.5/3G wireless links?

c) What is the procedure of a mobile terminated call in GSM.

d) Explain the J2ME architecture.

e) Explain how a mobile node acquires a CoA (Care of Address).

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

a) What are the benefits of using reservation schemes in MAC layer? Explain any one wireless MAC reservation scheme.

b) Explain the logical model underlying WAE.

c) What are the fundamental differences between wired networks and wireless ad-hoc networks related to routing?

d) Explain the elements introduced by GPRS.

e) Explain why it is difficult for a mobile node to communicate directly with the correspondent node in the return path?

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Total No. of Questions : 5] **[Total No. of Pages : 2**

P968

[3933] - 303
M.Sc.
COMPUTER SCIENCE
CS 23 - 303: Information Systems Security
(Old &New) (Sem. - III)

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 wherever necessary.***

Q1) Attempt all of the following : **[8 × 2 = 16]**

a) State any two types of passive attack.

b) What would be the transformation of a message "The codified message is called as cipher text". By using Rail Fence technique?

c) Write the usage of ECB &CFB mode.

d) What is key wrapping process?

e) What is the difference between MAC & Message digest.

f) Discuss steganography.

g) What is the difference between virus & worms.

h) List the advantages of IPsec.

Q2) Attempt any four of the following : **[4 × 4 = 16]**

a) Application gateway Firewall are generally more secure than packet filters. -Justify.

b) What is intruders? Explain any one intrusion detection mechanism?

c) What is reflection attack? How can it be Prevented?

d) Differentiate in between SSL & SET.

e) Discuss X . 800 security mechanisms.

P.T.O.

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

a) Alice meets Bob & says zewfidrkzfejpjkvdjjvtlizkp. If she is using modified ceaser cipher. What does she want to convey?

b) Explain the various steps in the various rounds of AES.

c) Given two prime numbers P = 23 & Q = 13. Find out N, E & D in an RSA encryption process.

d) Compare between MD5 & SHA - 1.

e) Explain how Record protocol in SSL provides confidentiality & integrity?

Q4) Attempt <u>any four</u> of the following : **[4 × 4 = 16]**

a) How digital certificates are used in PGP to trust the public key of user?

b) Explain the various fields used in the 3rd version of X .509 digital certificate.

c) A & B want to establish a secret key using Deffie Hellman key exchange protocol. Assuming the values are $h = 7$, $g = 11$, $x = 6$, $y = 8$. Find out the values of A, B, K_1 & K_2.

d) Explain the advantages & disadvantages of symmetric & asymmetric key cryptography.

e) List the protocols used in IPsec? Why they are required?

Q5) Attempt <u>any four</u> of the following : **[4 × 4 = 16]**

a) Explain Blowfish encryption & decryption process.

b) Discuss the detail steps of one round in IDEA .

c) How attackers cantry to break the security of a packet filter firewall?

d) Explain the different types of digital certificate.

e) Explain the single sign on approaches.

■ ■ ■