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BT-6/M-19  36116

# WEB ENGINEERING
## CSE-308N

Time : Three Hours]  [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

**1.** (a) What are the advantages and limitations of collaboration and communication ? **7**

(b) What is Information Architecture ? What are its different components ? Explain each in detail. **8**

**2.** (a) Write short notes on the following :

(i) Design sketches

(ii) Blue prints. **8**

(b) What are the aspects that distinguish different types of navigation ? Also discuss prime categories of navigation systems. **7**

P.T.O.

## Unit II

3. (a) Give an example in HTML to create three column layout. 8

   (b) Explain the following :

   (i) Plug-ins

   (ii) Style sheets.

4. (a) Illustrate with example different ways in which CSS can be used in HTML documents.

   (b) What are the advantages of documents level style sheet over inline style sheets ? What is the purpose of style class ? 6

## Unit III

5. (a) Explain various object creation and modification methods in Java Scripts. 7

   (b) Explain the process of events handling through Java Scripts. 8

6. (a) Explain various pattern matching expressions in Java Script. Explain in NaN() function. 6

   (b) Write a Java Script program to validate a form which accepts Name, Age, Email, Phone number of a student. 9

## Unit IV

7. (a) Write a Python program to print Fibonacci series upto $n$ terms. **6**

   (b) What is list in Python ? Demonstrate use of any *three* methods of list. **9**

8. (a) Write a Python program to read a string with punctuations and print the same string without punctuations. **8**

   (b) Outline with an examlpe various assignment operators supported in Python. **7**

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**34092**

# BT-4 / M-19

# OBJECT ORIENTED PROGRAMMING

## Paper–CSE-202 N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *Attempt **five** questions in all, selecting at least **one** question from each unit.*

### Unit–I

**1.** (a) Distinguish between the following terms : 10

(i) Data abstraction and Data encapsulation

(ii) Method overloading and method overriding

(b) What do you mean by Name spaces ? Explain with the help of example. 5

**2.** (a) What is a class ? What is the relation between an object and a class ? Write a program which shows how to define a class, how to access member functions and how to create and access object in C++. 10

(b) Explain public, private and protected access specifiers and show their visibility when they are inherited as public, private and protected. 5

### Unit–II

**3.** (a) What is a friend function ? Discuss its pros and cons with respect to normal member function with example. 7

(b) What do you mean by dynamic memory allocation ? Write a C++ program to elaborate the concept of New and Delete Operator. 8

4. (a) What is the benefit of copy constructor ? Explain the necessity of defining your own copy constructor. 7

   (b) What is the ambiguity problem in case of multiple inheritance? How it can be removed ? Explain with suitable example. 8

**Unit–III**

5. (a) What is Binding ? Differentiate between Static and Dynamic Binding. 5

   (b) Write a C++ program demonstrating use of the pure virtual function with the use of base and derived class. 10

6. (a) What is operator overloading ? What are the methods of overloading the operators in C++ ? Explain one method of operator overloading in C++ with example. 10

   (b) What is significance of Virtual Destructor ? Explain with suitable example. 5

**Unit–IV**

7. (a) What are the different types of file opening modes ? List their names with meaning. 8

   (b) Differentiate between function template and class template using suitable example. 7

8. (a) What is exception handling ? Write a C++ program that illustrate exception handling with the help of keywords : try, throws and catch 10

   (b) What is the difference between opening a file with constructor function and opening of file with open ( ) function ? Explain with example. 5

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**34093**

# BT-4 / M-19

# INTERNET FUNDAMENTAL

## Paper–CSE-204 N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *All questions carry equal marks. The candidates are required to attempt any five questions selecting at least one from each unit.*

### Unit–I

1. Explain following about internet :
   (a) Working of internet
   (b) Internet Congestion
   (c) Business culture on internet

2. Write short note on :
   (a) DNS
   (b) Internet address
   (c) Modems

### Unit–II

3. Explain the working of the search engines and searching strategies.

4. Write about :
   (a) Telnet and FTP
   (b) Plug-ins
   (c) Formatting and hyperlink commands in HTML

## Unit–III

5. Give a brief explanation on XML and JavaScript.

6. Describe working, management and protocols of e-mail.

## Unit–IV

7. What are software complexity ? Explain security policy, accessibility and risk analysis.

8. What are digital signatures and intrusion detection systems.

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**34095**

# BT-4 / M-19

# MICROPROCESSOR AND INTERFACING

## Paper–CSE-208 N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :-*** *Attempt **five** questions in all, selecting at least **one** question from each unit. All questions carry equal marks.*

### Unit–I

**1.** (a) Discuss the addressing mode of 8085 with atleast one example for each. 9

(b) Explain the following 8085 pins: 6

(i) RST 7.5 (ii) SOD (iii) ALE

**2.** Draw a block diagram of 8085 internal architecture and explain functions of decoding and execution of instruction. 15

### Unit–II

**3.** Draw the block diagram of 8086 microprocessor and explain its PSW. 15

**4.** (a) Discuss how 8086 CLK and RESET signals are generated? 10

(b) Discuss the WAIT STATE generation in 8086 microprocessor. 5

### Unit–III

**5.** (a) Discuss various addressing mode of 8086. 8

(b) Write an assembly language programme to find any power to any number. 7

6. What do you mean by instruction format? Explain the following instruction with the help of suitable example: 15

(i) ADC (ii) LEA (iii) PUSH

(iv) INC (v) JNZ

**Unit–IV**

7. (a) Design 16 bit I/O port using 8255 and interfaces it with 8086 using I/O addressing. 8

(b) Define an interrupt. Describe the interrupt response of an 8086 processor. 7

8. (a) Explain initialization command words (ICW) of 8259. 6

(b) Discuss DMA with the help of block diagram. 9

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**34096**

# BT-4 / M-19

# OPERATING SYSTEMS

## Paper–CSE-210 N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *Attempt **five** questions in all, selecting at least **one** question from each unit. All questions carry equal marks.*

### Unit–I

**1.** (a) How the parallel and distributed computing environments are implemented by the operating systems ? 7½

(b) Why it is always beneficial to use various types of protection by the operating systems ? 7½

**2.** (a) Explain and justify the roles of the following :

(i) Multiprogramming 3

(ii) Time sharing 3

(iii) Multithreading 3

(b) Discuss the technical modus operandi of using virtual machines and system calls. 6

### Unit–II

**3.** (a) Define thread. What are the benefits of threads ? Explain the scientific differences of using users and kernel threads. 7½

(b) What is the basic role of using process synchronization ? Explain the basic taxonomy of using binary semaphores and queue semaphores. 7½

4. (a) Draw and explain the flow of process management activity that takes place during co-operating processes and inter process communication. 5

(b) What do you mean by mutual exclusion ? Explain Dekker's solution for mutual solution. 5

(c) Define process scheduling. Differentiate between preemptive and non-preemptive scheduling. 5

## Unit–III

5. (a) Define paging with the help of a schematic diagram. Explain the principles which are involved in the operation of paging. Also, discuss about the hardware support for paging. 7½

(b) Explain the Dual-mode operation of an operating system. Explain contiguous memory allocation and linked allocation methods with the help of suitable working diagram. 7½

6. (a) Explain the concept of thrashing. What are the two available techniques to prevent thrashing ? Explain them in detail. 7½

(b) What is fragmentation ? What is the need of fragmentation? Explain the difference between internal and external fragmentation. 7½

## Unit–IV

7. (a) Draw the Gantt chart for the SSTF and FCFS scheduling policies and calculate the turnaround time, average turnaround time, waiting time, average waiting time, throughput and processor utilization for the following set of processes that arrive at a given arrival time shown in the table by applying SSTF and FCFS. 12

| Process | Arrival Time | Processing Time (Milliseconds) |
|---|---|---|
| P1 | 0 | 2 |
| P2 | 1 | 4 |
| P3 | 2 | 5 |
| P4 | 4 | 1 |
| P5 | 5 | 6 |
| P6 | 6 | 2 |

(b) Briefly explain the method of chaining for disk space management. 3

8. (a) Explain file free space management approaches. Write the role of sector sparing in identifying the bad blocks of mass storage. How different resources are assigned during free space management. 7½

(b) Write about monolithic kernel, layered and microkernel structures of UNIX file system. 7½

15/05/2019

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**34001**

**BT–4 / M-19**

# COMPUTER ARCHITECTURE AND ORGANIZATION

## Paper–CSE-202 (E)

*Time allowed : 3 hours]* *[Maximum marks : 100*

***Note :-*** *Attempt only **Five** questions. All questions carry equal marks.*

**1.** (a) List the main physical differences between the following memory technologies: SRAMs, flash memories, Magnetic Disk and Magnetic Tape, floppy disks, Optical hard disks, and CD-ROMs. 10

(b) (i) If a direct mapped cache has a hit rate of 95%, a hit time of 4 ns, and a miss penalty of 100 ns, what is the average memory access time? 10

(ii) In a system L1 cache hit time is 1 ns, a L2 cache hit time is 5 ns and a L2 miss penalty of 17ns. Given a L1 hit rate of 98% and a L2 hit rate of 98%. Calculate average memory access time. 10

**2.** (a) Consider a 16-bit processor in which the following appears in main memory, starting at location 200: 16

| | | |
|---|---|---|
| 200 | Load AC | Mode |
| 201 | 500 | |
| 202 | Next Instruction | |

Figure 1: Three locations of main memory.

The first part of the first word indicates that this instruction

loads a value into an accumulator. The Mode field specifies an addressing mode and, if appropriate, indicates a source register; assume that when used, the source register is R1, which has a value of 400. There is also a base register that contains the value 100. The value of 500 in location 20 1 may be part of the address calculation. Assume that location 399 contains the value 999; location 400 contains the value 1000, and so on. Determine the effective address and the operand to be loaded for the following address modes:

(a) Direct

(b) Immediate

(c) Indirect

(d) PC relative

(e) Displacement

(f) Register

(g) Register indirect

(h) Auto indexing with increment, using R1

(b) Write down the difference (At least 5) in RISC and CISC with respect to architectural design. 4

3. (a) Explain working of direct memory access (DMA) with the help of block diagram. Why does DMA have priority over CPU when both request a memory transfer? 10

(b) A digital computer has a memory unit with 24 bits per word. The instruction set consists of 150 different operations. All

instructions have an operation code part (opcode) and an address part (allowing for only one address). Each instruction is stored in one word of memory. 10

(a) How many bits are needed for the opcode?

(b) How many bits are left for the address part of the instruction?

(c) What is the maximum allowable size for memory?

(d) What is the largest unsigned binary number that can be accommodated in one word of memory?

**4.** (a) Given below are two expressions to calculate using stack Push and Pop operations. Evaluate them by Zero address Stack instructions. 10

(i) $a=g^*(c/d+4)-3*h$

(ii) $a=(x-y)*(9+3)*(z*15/y)$

(b) Describe two policies used to determine which page is removed from main memory to make room for a new one. What are the advantages of each? 10

**5.** (a) Elaborate using suitable diagrams Parallel Priority Interrupt and Daisy-Chaining Priority Interrupt. 10

(b) Consider a main memory with five page frames and the following sequence of page references: 10

9 8 2 1 2 1 1 2 2 1 3 3 6 2 3 1 3

The number of page fault using FIFO, LRU and Optimal replace policy.

6. (a) Elaborate the Instruction Cycle of computer architecture with flow chart and give a brief explanation. 10

   (b) The content of the top of a full-descending memory stack is 5320. The content of the stack pointer SP is 3560. A two-word call subroutine instruction is located in memory at address 1120 followed by the address field of 6720 at location 1121. Note that all numbers are in decimal. What are the content of PC, SP and the top of the stack: 10

   (a) Before the call instruction is fetched from memory?

   (b) After the call instruction is executed?

   (c) After the return from subroutine?

7. (a) What do you understand by the term 'Program Interrupt'? Explain Interrupt cycle with the help of suitable diagram. What is the difference between software interrupts and a subroutine call? 10

   (b) Explain in detail the term "Pipe lining" also draw the block diagram of Arithmetic Pipeline and Instruction Pipeline. 10

8. Explain the different types of mapping procedures in the organization of cache memory with block diagrams in detail. 20

22/05/2019 (E)

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**34002**

# BT-4 / M-19

# PROGRAMMING LANGUAGE

## Paper–CSE-204E

*Time allowed : 3 hours]* *[Maximum marks : 100*

***Note :*** *Student will be required to attempt **five** qustions in all, at least **one** question from each unit.*

### Unit–I

1. (a) What are characteristics of good programming language ? 8

   (b) Explain specification and implementation of integer and character data type. 12

2. What are different formal method of describing syntax and what are different problems in describing syntax ? 20

### Unit–II

3. What do you mean by vector and array and also explain type checking in detail ? 20

4. Explain abstraction and encapsulation with the help of appropriate example. 20

### Unit–III

5. What is implicit sequence control and explicit sequence control? Explain sequence control within statement. 20

6. What is Exception and how the exception is handled in a programming language ? Prove it by taking example. 20

## Unit–IV

7. Explain stack based storage management and heap storage management in detail with example. 20

8. What is difference between procedural, non procedural and functional languages ? 20

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BT-6/M-19 36001

# MOBILE COMPUTING
## CSE-302 (Opt. I)

Time : Three Hours] [Maximum Marks : 100

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

1. (a) Describe the various challenges in mobile computing. **10**

   (b) Differentiate between FDMA, TDMA and GSM. **10**

2. (a) What is meant by handoff ? Explain the types of handoffs. **10**

   (b) Explain mobile IP with the help of a suitable diagram. **10**

### Unit II

3. (a) Explain pull and push based data delivery models. **10**

(b) Explain the importance of file system support for mobility. **10**

4. (a) Write a short note on data dissemination by broadcast. **10**

(b) Describe coda and other storage manager for mobility support. **10**

## Unit III

5. (a) Explain Adhoc network routing protocols. **10**

(b) Write a short note on DSR. **10**

6. (a) Describe global state routing with the help of a suitable diagram. **10**

(b) Explain zonal routing algorithm. **10**

## Unit IV

7. (a) Describe Kangaroo and Joey transactions. **10**

(b) Discuss team transaction. **10**

8. Write short notes on the following :

(a) Issues of Electronic payment **10**

(b) Recovery model for mobile transactions. **10**

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BT-6/M-19 36002

# COMPUTER HARDWARE TECHNOLOGIES

## CSE-304 (Opt. ii)

Time : Three Hours] [Maximum Marks : 100

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

### Unit I

1. (a) Discuss the basic scenarios during which memory error appears. **10**

   (b) What is the need of memory bank ? Also explain the procedure of filling the memory bank with memory chips. **10**

2. Explain the tools and techniques required to troubleshoot power-supply operation. **20**

### Unit II

3. (a) What are the different methods to allocation and enable system resources for a particular device or port ? **10**

(b) Discuss the parameters stored in CMOS for setting up devices. **10**

4. (a) Why VESA Local Bus is able to cope up with the graphics load imposed by different operating systems ? **10**

(b) Highlight the features of PCI bus which makes it suitable for Pentium processor series. **10**

## Unit III

5. Explain in detail the characteristics of serial and parallel ports in terms of its connectors and configurations. **20**

6. (a) How the devices are connected and accessed in a PC using SCSI interface ? **10**

(b) Give a brief outline of the commonly used data transfer protocol for IDE devices. **10**

## Unit IV

7. Write short notes on the following :

(a) Hard disk (b) Monitors. **20**

8. (a) What are the basic mechanical switch designs used in keyboard ? **10**

(b) Discuss the basic approaches used in trouble shooting of drives. **10**

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BT-6/M-19

**36003**

# NETWORK MANAGEMENT AND SECURITY

## CSE-306

Time : Three Hours]

[Maximum Marks : 100

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

1. (a) What do you understand by Cryptographic Hash Functions ? Also, explain the role of a compression function in a hash function with example.

   (b) What is the difference between specific and pervasive security mechanism ? How does cryptography help in achieving security ? Also, explain arithmetic and logical functions that are used in SHA.

2. What is the difference between an unconditionally secure cipher and a computationally secure cipher ? Consider a cryptosystem, with P, K, and C denoting the Plaintext, key, and Ciphertext, respectively. Prove that for any cryptosystem, $H(K|C) \leq H(P|C)$, that is, given the Ciphertext, the attacker's ambiguity of the key is at least as large as the uncertainity of the plaintext.

## Unit II

3. (a) What do you understand by Heisenbug and Bohrbug ? How are these different from each other ? Explain using suitable examples.

   (b) What is Multilevel Security in SELinux ? Explain.

4. What do you mean by authority management objects in Operating System ? What are the objects on which security can be applied by operating system ? Also, explain the differences between Access Matrix and Access Control with examples.

## Unit III

5. What are the differences between Botnet and Trojan Horse ? How are these different from viruses ? Explain with suitable examples. Also, what are the mechanisms used for overcoming these attacks ?

6. Write short notes on the following :
   (a) Chain of certificates, and revocation of X.509 certificate
   (b) Kerberos realm
   (c) IPSEC.

**Unit IV**

7. What is meant by identity thefts ? Explain various TCP/IP protocol vulnerabilities in detail.

8. How does an intrusion detection system differ from firewall ? How do firewalls provide security to neworks ? Justify using classification of firewalls.

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BT-6/M-19 36004

# SOFTWARE ENGINEERING
# CSE-308

Time : Three Hours] [Maximum Marks : 100

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

## Unit I

1. (a) What is Software ? What are the attributes of good software ? **10**

   (b) Explain prototype model in detail. What is the effect of designing a prototype on the overall cost of the software project ? **10**

2. (a) Discuss the role of planning in software project ? What are the advantages of using PERT charts in scheduling software project ? **10**

   (b) Explain any *two* software cost estimation techniques using suitable example. **10**

## Unit II

3. (a) What is the importance of software configuration management in software engineering ? **10**

   (b) What do you mean by risk ? Explain the different types of software risks. **10**

4. (a) What do you mean by Software Requirement Specification (SRS) ? What is its need ? Discuss various characteristics of SRS. **10**

   (b) Explain the difference between structured analysis and object oriented analysis with the help of suitable example. **10**

## Unit III

5. (a) Define module cohesion and explain different types of cohesion. **10**

   (b) Briefly illustrate feature of structured design and object oriented design. **10**

6. Explain the following terms :

   (a) Defensive programming **10**

   (b) Fault avoidance and fault tolerance. **10**

## Unit IV

7. (a) What are the different types of software maintenance ? Why software maintenance is required ? Discuss with example. **10**

   (b) Why are three different level of testing, unit testing, integration testing and system testing necessary ? Discuss the main purpose of each of these testing. **10**

8. (a) Write a short note on computer aided software engineering (CASE) tools. **10**

   (b) Design various tests cases to find out the roots of a quadratic equation using boundary value analysis and equivalence class partitioning. **10**

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# BT-6/M-19 36007

# ADVANCED DATABASE SYSTEMS

## CSE-324

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. All questions carry equal marks.

### Unit I

1. What form of parallelism (inter-query, inter-operation and intra-operation) is likely to be the most important for each of the following tasks : (a) Increasing the throughput of a system with many small queries (2) Increasing the throughout of a system with a few large queries, when the number of disks and CPU in large. **10+10=20**

(a) What is query processing in distributed database ? How data is stored and processed in DDBMS ?

(b) Draw a neat sketch of distributed DBMS architecture. Elaborate the problems associated with distributed concurrency control. **10+10=20**

## Unit II

3. What is Clustering ? Differentiate between data matrix and dissimilarity matrix. Explain hierarchical method of clustering detail. **20**

4. (a) What is meant by support, confidence, join, prune and item-set in association rule mining ?

   (b) Write a detailed note on similarity search over sequences. **10+10=20**

## Unit III

5. How RDBMS differ from ORDBMS and OODBMS ? Explain the designing steps for implementing of ORDBMS. **20**

6. What are object oriented database systems ? How persistence is handled in typical OODBMS ? Explain structured types and reference types. **20**

## Unit IV

7. How a query is processed in multimedia databases ? Discuss multimedia sources identified in multimedia database. **20**

8. (a) What do you mean by temporal databases ? Write a precise note on valid time and transaction time by a suitable example.

(b) Write and explore the strategies to ensure integrated access to multiple data sources ? 10+10=20

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BT-6/M-19 **36113**

# COMPILER DESIGN

## CSE-302N

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all. Q. No. **1** is compulsory. In addition to that attempt *four* more questions selecting exactly *one* question from each Unit.

### Unit I

1. (a) What are regular expressions ? Write a regular expression for a language that accept all those strings in which the number of one's are odd and the number of zero's are even. **7½**

   (b) What is Deterministic Finite Automation (DFA) ? How is it related to Regular expression ? **7½**

2. Draw a flow diagram for showing the phases of a compiler and discuss each phase in detail. **15**

## Unit II

3. (a) Describe the role of a parser in a compiler. How different types of errors can be handled by a parser ? 8

   (b) Differentiate between regular expression and CFG. 7

4. (a) Write down an algorithm for detecting unreachable entries in a LR parsing table. 7½

   (b) Construct error-correcting LR parser for the following grammar :

   stmt → *if* e *then* stmt
   | *if* e *then* stmt *else* stemt
   | *while* e *do* stmt
   | *begin* list end
   | s

   list → list; stmt
   | stmt. 7½

## Unit III

5. (a) Construct the DAG for the following basic block :

   D : = B * C
   E : = A + B
   B : = B * C
   A : = E – D 8

(b) Explain machine dependent and machine independent code generation. What are their advantages ? 7

6. What do you mean by Intermediate Code ? How can you generate intermediate code for declarative and assignment statements ? Explain with appropriate examples. **15**

## Unit IV

7. What is loop optimization ? Explain various kinds of loop optimization with the help of suitable examples. **15**

8. (a) How heap storage management is done ? Explain. **7½**

(b) What do you mean by data-flow analysis ? Explain using suitable examples. **7½**

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BT-6/M-19 **36114**

# ESSENTIALS OF INFORMATION TECHNOLOGY

## CSE-304N

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

**1.** (a) Discuss about the various steps involved in analysis of an algorithm.

(b) What are computation problems ? Discuss its various classifications. **8+7=15**

**2.** (a) Write Quick sort algorithm to sort data from a particular list. How its time complexity is obtained ?

(b) What do you mean by Queue ? Discuss different types of queues. **8+7=15**

## Unit II

3. (a) What is a data type ? Explain different data types in detail with examples.

   (b) What is the difference between while and do while loop ? **8+7=15**

4. Briefly explain the following :

   (a) Instance variables and methods

   (b) Constructors

   (c) Use case diagrams. **5+5+5=15**

## Unit III

5. (a) What is Polymorphism ? Discuss methodology for static and dynamic polymorphism.

   (b) Differentiate between aggregation, generalization and association. **8+7=15**

6. Explore the best coding standards offered by industry. How codes are tuned and optimized ? **15**

## Unit IV

7. (a) Outline and explain the different symbolic notation used to draw ER diagram.

(b) What is Normalization ? Discuss normal form based on full and partial function dependency. **8+7=15**

**8.** (a) Why SQL is a query language ? Distinguish between delete, drop and truncate commands with example.

(b) What do you mean by views ? How views are created and dropped ? **8+7=15**

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BT-6/M-19 36115

# MOBILE COMPUTING
## CSE-306N

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

1. Answer the following questions in brief :
   (a) What is Mobile Computing ? What are its major advantages ?
   (b) What are the design considerations for mobile computing ?
   (c) What are the ways by which existing applications can be made mobile enabled ?

2. Describe the system architecture of GSM and provide an overview of the various GSM channels. How do HLR and VLR support location management ? Explain channel assignment and handoffs.

## Unit II

3. What are the different types of wireless LANs ? Give an overview of 802.11 wireless LAN. How is it different from Bluetooth ?

4. (a) What are the components of Mobile IP ? How does mobile IP work ?
   (b) Explain, why the MAC protocol is more important in wireless LANs than in wired LANs ?

## Unit III

5. What are the data management issues in mobile computing ? Explain the issues in brief.

6. Define cloud computing and identify its core features, characteristics and benefits. Briefly summarize the types of clouds.

## Unit IV

7. What are the characteristics of Mobile Ad hoc networks ? Give an overview of MAC issues and QoS in ad hoc networks.

8. Give a classification of MANET routing protocols along with a description of any *two* popular MANET routing protocols.

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BT-6/M-19 36117

# SOFTWARE ENGINEERING
# CSE-310N

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

## Unit I

1. (a) What are key challenges facing software engineering ? What are the importance of process models in software development ? 7

   (b) With the neat diagram, explain the evolutionary development model of software development. 8

2. (a) Differentiate between RAD and prototype. 7

   (b) Explain the incremental process model with advantages and disadvantages. 8

## Unit II

3. (a) Give Software Requirements Specification (SRS) for developing a software for course management system. 7

   (b) What is the importance of software quality assurance in software engineering ? Explain the SQA activities.

4. (a) Draw DFD (level 0, 1 and 2) for software of payroll management system. 10

   (b) Discuss the different task in software risk management. 5

## Unit III

5. What are the principal different between software design methodologies based on functional abstraction and those based on data abstraction ? Name the design techniques based on each of these two software design paradigm. 15

6. (a) How would you improve a software design that display very low cohesion and high coupling ? 8

(b) Point out three important differences between the function oriented and object oriented approaches to software design. Validate your answer through suitable examples. 7

## Unit IV

7. (a) What is the objective of system testing ? Explain the system testing techniques. 8

(b) How the maintenance cost calculated ? Explain with example. 7

8. (a) Why integration testing required ? Explain the different integration testing methods. 8

(b) Write down the debugging approaches for software project. 7

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# BT–7 / M–19
# UNIX AND LINUX PROG.
# Paper–CSE–401N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *Attempt any **five** questions, selecting at least **one** from each unit. All carry equal marks.*

## Unit–I

**1.** (a) Explain in detail UNIX file system with suitable examples.

(b) Explain logging-in and out command with example.

**2.** Explain script function and conditional looping with example.

## Unit–II

**3.** Explain parallel compression with xdelta utility.

**4.** Explain regular expression pattern command with syntax.

## Unit–III

**5.** (a) Explain use of make file and dependency calculation with example.

(b) Explain debugging tools in brief.

**6.** Explain frequency based frequency techniques.

## Unit–IV

7. (a) Explain process related command in linux with syntax and example.

   (b) Explain how security and privilege are provided to an user in linux.

8. Explain the following with examples :

   (a) Threading

   (b) Linux I/O system

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BT-8/M-19 38153

# NEURAL NETWORK & FUZZY LOSE
# CSE-402-N

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

## Unit I

1. (a) What are the different characteristics of Neural networks ? 8

   (b) Explain the biological prototype of Artificial Neural networks. 7

2. What are different types of techniques of training in Artificial Neural netwoks ? Explain this with the help of example. 15

## Unit II

3. What are the application of Counter propagation network and also explain image classification with appropriate example. 6+9

4. What do you mean by Back propagation and also explain its Learning Algorithm with the help of example. **15**

## Unit III

5. Draw the architecture of ART and also explain its classification operation with phase wise. **15**

6. What is difference between cognitrons and neocognitrons with its structure wise and application wise ? **15**

## Unit IV

7. What are different classical sets and also explain Fuzzy operation of Intersection, Union and Aggregation with an appropriate example ? **8+7**

8. What do you mean by Neuro-fuzzy system and explain differential evolution optimization method in brief ? **5+10**

6. What do you mean by Back propagation and also explain its Learning Algorithm with the help of example. **15**

## Unit III

5. Draw the architecture of ART and also explain its classification operation with phase wise. **15**

6. What is difference between cognitrons and neocognitrons with its structure wise and application wise ? **15**

## Unit IV

7. What are different classical sets and also explain Fuzzy operation of Intersection, Union and Aggregation with an appropriate example ? **8+7**

8. What do you mean by Neuro-fuzzy system and explain differential evolution optimization method in brief ? **5+10**

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BT/8/M-19 **38154**

# MOBILE APPS DEVELOPMENT

## CSE-404-N (Opt. I)

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

1. Explain the creation of Android Virtual Device (AVD) to run android program on emulator. **15**

2. (a) Compare the mobile application development with traditional applications development with sutiable examples. **8**

   (b) Write a short note on app User Interface Designing. **7**

### Unit II

3. Describe the life-cycle of an android activity with neat sketch. Explain the interaction amongst activities. **15**

4. Explain the following terms :
   (a) Broadcast receivers
   (b) Content providers. 15

## Unit III

5. Explain the following :
   (a) Animation APIs
   (b) Enterprise data access. 15

6. (a) Write a short note on mobile database SQLite. 8
   (b) Discuss Sprucing up mobile apps. 7

## Unit IV

7. (a) What are the different steps for debugging mobile apps ? 8
   (b) Explain white box testing of mobile apps with example. 7

8. (a) Discuss Junit for Android.
   (b) What do you understand by test automation of mobile apps ? 7

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BT-8/M-19 38155

# SOFTWARE TESTING (E-III)
# CSE-412N

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting exactly at least *one* question from each Unit. All questions carry equal marks.

## Unit I

1. (a) Why effective software testing in hard ? Explain using suitable examples. 7½

   (b) What is SDLC ? How is it different from STLC ? Explain. 7½

2. What is meant by verification ? How verification can be done at requirement, high-level design and low-level design ? Explain in detail. Also differentiate between verification and validation. 15

## Unit II

3. (a) How the equivalence partitioning and cause-effect graphing is used for testing ? Explain using suitable examples. 7½

   (b) Differentiate between boundary value analysis and wrost case testing. 7½

4. Describe the various techniques for control flow and data flow based testing using suitable examples. 15

## Unit III

5. (a) State and explain various guidelines for prioritization during testing. 7½

   (b) What is Slice Based Testing ? Explain its merits and demerits in comparison to other types of testing. 7½

6. (a) Comment on the need of system testing ? How is it different from integration testing. 7½

   (b) What is domain testing ? How it can be done ? Explain using suitable examples. 7½

## Unit IV

7. What are the challenges in object-oriented software testing ? Describe various class testing strategies in detail. **15**

8. Write short notes on the following :

   (a) User-Interface Testing

   (b) Performance Testing

   (c) Usability Testing. **15**

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**37151**

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# BT–7 / M–19
# CRYPTOGRAPHY AND INFORMATION SECURITY
## Paper–CSE–419 N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *Attempt **five** questions in all, selecting at least **one** question from each unit.*

### Unit–I

**1.** (a) What is Shannon's theorem for perfect secrecy ? 3

(b) Encrypt the plain text [3,4], for [S] = [0 1 2 3 4] and K = [2 3] using RC4 cipher. 6

(c) Use the playfair cipher to encipher and decipher the message "Computer engineering" using the key *'largest'*. 6

**2.** (a) Discuss various substitution and transposition classical ciphers. 6

(b) What is the difference between threat and an attack? 2

(c) What do you understand by term security services? Define any five. 5

(d) Define avalanche principle in context to cryptography? Give example. 2

## Unit–II

3. (a) Compute the output of MixColumn transformation for the sequence of input bytes "67 89 AB CD". 8

   (b) In a public key cryptosystem RSA, you intercept the ciphertext C = 10 sent to a user whose public key is e=5, n=35. What is the plaintext ? 5

   (c) Differentiate CPA and CCA attacks. 2

4. (a) Explain 3-DES encryption algorithm. Discuss its strength and weaknesses. 7

   (b) Discuss E1 Gamal public key cryptosystem. 5

   (c) What is the difference between MAC and HASH functions ? 3

## Unit–III

5. (a) How key exchange takes place in DH algorithm ? Explain man-in-the-middle attack on DH algorithm with the help of example. 8

   (b) Draw on overview of Kerberos illustrating all the message exchanges. 7

6. (a) Write a note on : 8

   (i) IPSEC

   (ii) S/MIME

   (b) Explain any two key exchange protocols. 7

## Unit–IV

7. Explain:

   (i) SHA1

   (b) digital certificates

   (c) MD5 15

8. (a) Elaborate the difference between firewalls and intrusion detection system. 10

   (b) Explain interactive proof systems. 5

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BT-8/M-19 38159

# CLOUD COMPUTING (E-IV)

## CSE-420N

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

1. (a) Differentiate Cloud computing and Grid computing. **7**

   (b) Discuss Business driver for adopting cloud computing. **8**

2. (a) Discuss various services provided by cloud computing. **8**

   (b) Write short note on evolution of cloud computing. **7**

### Unit II

3. (a) Compare cloud computing architecture with Client Server Architecture. **8**

(b) Explain IAAS ? Explain its advantagse and disadvantages. 7

4. Explain the working various deployment models used in cloud computing. 15

## Unit III

5. (a) How is the data stored in cloud ? Discuss various types of storage systems used in cloud. 8

   (b) Computer scaling hardware Traditional *vs.* Cloud. 7

6. Write short notes on the following :

   (a) Amazon Web Services

   (b) Eucalyptus 15

## Unit IV

7. (a) Discuss the principles of security in cloud computing. 7

   (b) Explain cloud contracting model. 8

8. (a) Explain infrastructure security and host level security in detail. 8

   (b) Discuss Authentication mechanism in Cloud Computing. 7

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# BT–7 / M–19
# EXPERT SYSTEMS
# Paper–CSE–425 N

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *Attempt **five** questions in all selecting at least **one** question from each unit. All questions carry equal marks.*

## Unit–I

**1.** (a) What is the difference between blind search and heuristic search ? Discuss.

(b) What do you understand by Robinson's resolution principle ? What is proof by refutation ? Explain using suitable examples.

**2.** (a) What is hill climbing search ? What are its limitations ? Discuss.

(b) What is unification ? What do you understand by most general unifier (mgu) ? Discuss the algorithm to find mgu.

## Unit–II

**3.** (a) What is an Expert System ? What are its different components ? Discuss.

(b) What are the different stages of Expert System development ? Discuss.



[Turn over

4. (a) What is the rule-based architecture of expert system ? What are its advantages ? Discuss.

   (b) Write a note on the applications of Expert System.

**Unit–III**

5. Why is it difficult to acquire the knowledge from human experts ? Discuss the different techniques for knowledge elicitation.

6. What is expert system shell ? Write a note on tools used to develop the expert systems.

**Unit–IV**

7. Discuss in detail the problems faced in interaction with domain experts during expert systems development.

8. Why is the development of an expert system an iterative process ? Explain.

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BT-8/M-19 38001

# NEURAL NETWORKS & FUZZY LOGIC
## CSE-402E

Time : Three Hours] [Maximum Marks : 100

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

### Unit I

1. (a) Discuss in brief about how human brain processes information and how is this approach being used in the design of artificial neural networks. **10**

   (b) Explain any *four* practical real life applications of neural networks. **10**

2. (a) What is a single layer perceptron ? In what type of classifications does it prove effectively ? Explain. **10**

   (b) If the net input to an output neuron is 0.56, calculate its output when the activation function used is bipolar sigmoidal and binary sigmoidal. **10**

## Unit II

3. Draw the architecture of a Hopfield network and explain its working. Also discuss the stability condition of a Hopfield network. **20**

4. (a) Explain in detail about back propagation method for the training of a multilayer feedforward networks in algorithmic form. **10**

   (b) Draw the block diagram of a Counter Propagation network and explain its normal mode of operation. **10**

## Unit III

5. (a) What is Auto associative net ? Explain the application algorithm of an auto associative net. **10**

   (b) Explain how weights are computed in a bi-directional associative memory and also show how associations are stored and retrieved. **10**

6. (a) Explain the major phases involved in the ART classification process. **10**

   (b) Explain in detail about distributed file system implementation with suitable example. **10**

## Unit IV

7. (a) What do you understand by 'Tournament Selection' with reference to GA ? How does it overcome the demerits of 'Roulette Wheel Selection' ? **10**

   (b) What is Mutation ? What are the objectives of using mutation ? Explain with examples. **10**

8. (a) What is an optical neural net ? What is its superiority over normal types of nueral nets ? Explain. **10**

   (b) What are holographic correlators ? Write a short note on its use in image recognition system. **10**

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BT-8/M-19 38006

# SOFTWARE VERIFICATION, VALIDATION AND TESTING

## CSE-450E

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

### Unit I

1. (a) Describe the software testing principles. How does testing help in producing quality software ? 7½

   (b) Write the procedure to make test cases with examples. 7½

2. What is White box testing ? Discuss various pros and cons of White box testing. Discuss various WBT techniques with example. 15

### Unit II

3. (a) What is Graph Metric ? List various graph metrics used in testing. 7½

   (b) Discuss various phases in risk analysis. 7½

4. Explain the following testing : 2×7½=15

(i) Data Flow (ii) Slide Based.

## Unit III

5. (a) Discuss different levels of testing. 7½

(b) What is debugging ? Write different steps involved in debugging. 7½

6. (a) Explain the following terms with example :

(i) Unit Testing (ii) GUI Testing. 7½

(b) What is Object Oriented Integration Testing ? How is it different from Object oriented system testing ? 7½

## Unit IV

7. Differentiate static and dynamic testing tools with example. List various dynamic tool used in testing. 15

8. Write short notes on the following : 2×7½=15

(a) Agile Testing (b) Ad-hoc Testing.

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BT-8/M-19 38009

# DATA WAREHOUSING AND DATA MINING

## CSE476-E

## (Departmental Elective-V)

Time : Three Hours] [Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

### Unit I

1. (a) Why is data mining important ? What are the issues and challenges in data mining ? 7

   (b) Comment on the following key features of data warehouse : Integrated, Subject-oriented, Non-volatile, Time-variant. 8

2. (a) Different between operational database system and data warehousing. 8

   (b) What are the steps for the data mining process ? 7

## Unit II

3. Explain the following :
   (a) Distributed data warehouse
   (b) Centralized data warehouse. 15

4. (a) What is the multidimensional data model ? Explain in detail. 7
   (b) What is a data warehouse ? Discuss the designing, construction and implementation of data warehousing. 8

## Unit III

5. In the context of data warehouse define the following terms :
   (a) Meta data
   (b) Operational data
   (c) Operational database. 15

6. (a) Explain 3-tire data warehouse architecture with a neat and clear diagram. 7
   (b) What do you understand by decision support system (DSS) ? What are the differences between DSS and MIS ? Explain in detail. 8

## Unit IV

7. Write short notes on the following :
   (a) Fuzzy rules
   (b) Genetic algorithms
   (c) Knowledge discovery database (KDD). **15**

8. How neural networks are used for pattern classification ? Explain the back propagation algorithm. **15**

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**37001**

**BT-7 / M-19**

**COMPILER DESIGN**

**Paper–CSE-401**

*Time allowed : 3 hours]* *[Maximum marks : 100*

*Note: Attempt **five** questions in all selecting at least **one** question from each unit. All questions carry equal marks.*

**Unit - I**

1. Identify the phases into which a compiler can be conceptually divided and discuss the role of each phase. Is error handling going to be a separate phase in the process of compilation?

2. (a) When is a grammar said to be ambiguous and when is it said to be left recursive? Illustrate using suitable examples.

   (b) What are the approaches for top-down parsing? Explain using suitable examples.

**Unit - II**

3. (a) What is the purpose of syntax-directed translation? Describe any one way of implementing a syntax-directed translator.

   (b) Describe postfix notation and the evaluation of a postfix expression using an example.

4. Describe how ordered list, tree, and hash table can be used to create symbol table.

**Unit - III**

5. Why is run-time storage management required in compilers? What is the layout of activation records for block-structured languages? Illustrate using a skeleton of a block- structured program? What are the other implementation aspects of block structured languages that may require run-time storage management?

6. What can be the sources of errors in a program? Illustrate using examples, the kind of syntactic errors and lexical-phase errors.

**Unit - IV**

7. Discuss the necessity of optimization in compilation and explain loop optimization and local optimization using suitable examples.

8. Answer the following questions in brief:
   (a) How is a code generated for a basic block from its DAG representation?
   (b) What is the purpose of register allocation in code generation?
   (c) What is peephole optimization?

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BT-8/M-19 38002

# INTERACTIVE COMPUTER GRAPHICS

Paper-CSE-404 (Set II)

Time : Three Hours] [Maximum Marks : 100

**Note :** There will be eight questions in all. Two questions will be set from each Unit. Attempt *Five* questions in all, selecting at least *one* question from each Unit.

## Unit I

1. What is CRT ? How is the image display on Raster Scan and Random Scan display system. **20**

2. Write notes on the following :
   (a) Frame Buffer and Refresh Rate **10**
   (b) Display Processor. **10**

## Unit II

3. Explain the Bresenham's line drawing algorithm with suitable examples. **20**

4. Explain the following :

   (a) Screen Coordinate and User Coordinate **10**

   (b) 2D Transformation. **10**

## Unit III

5. (a) Explain the working of light pen and digitizing tablet. **10**

   (b) Elastic and Rubber Band Technique. **10**

6. (a) What do you mean by interactive and non-interactive graphics ? **10**

   (b) Zooming and Panning. **10**

## Unit IV

7. What is 3D Transformation ? Explain the various 3D transformation techniques in detail. **20**

8. Write notes on the following :

   (a) Perspective depth **10**

   (b) Hidden Line. **10**

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**37003**

**BT-7 / M-19**

# STATISTICAL MODELS FOR COMPUTER SCIENCE

## Paper- CSE-405

*Time allowed : 3 hours]* *[Maximum marks : 100*

***Note :*** *Attempt any **five** questions, selecting at least **one** question from each unit. Each question carries equal marks.*

### Unit–I

**1.** (a) Define probability axioms. Prove the following relation :

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$ 10

(b) Derive an expression for generalized Bernoulli trial. 10

**2.** (a) Derive an expression for posteriori probability. 10

(b) Of all the graduate students in a university, 70% are women and 30% are men. Suppose that 20% and 25% of the female and male population, respectively, smoke cigarettes. What is the probability that a randomly selected graduate student is: 10

(i) A woman who smokes?

(ii) A man who smokes?

(iii) A smoker?

## Unit–II

3. (a) Define and explain exponential distribution. Discuss its Markov property in detail. 10

   (b) Define probability generating function of a discrete random variable X. Explain probability generating function of some discrete distributions. 10

4. (a) Let $X_1, X_2, \ldots\ldots X_n$ be mutually independent discrete random variables. If $X_i$ has binomial distribution with parameters $n_i$ & P, then $\sum_{i=1}^{n} X_i$ has the binomial distribution with parameters $n_1 + n_2 + \ldots\ldots n_n$ & P. 10

   (b) Show that probability generating function of a geometric random variable with parameter P is given by

   $$\left(\frac{Pz}{1-z(1-p)}\right)$$ 10

## Unit–III

5. (a) Explain the generalization of Bernoulli process. 10

   (b) What is meant by Stochastic process? Explain the classification of stochastic processes with the help of suitable examples. 10

6. State and prove renewal theorem. 20

## Unit–IV

7. (a) Explain M/G/1 queuing system. 10

   (b) What do you understand by irreducible finite chains with aperiodic states? Explain. 10

8. (a) Write short note on no-birth-death processes. 10

   (b) Explain distribution of times between state changes. Discuss with the help of suitable example. 10