# (DCS / DIT 311)

## B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE & IT

## Paper - I : Operating Systems

**Time : 3 Hours** **Maximum Marks : 75**

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***Answer question No.1 compulsory*** ***(5 × 3 = 15)***

***Answer one question from each unit*** ***(4 × 15 = 60)***

***1)*** Write short notes on :

a) Inter – process Communication

b) Atomic transaction

c) Swapping

d) Demand pagging

e) Thrashing

**UNIT – I**

***2)*** a) Explain distributed system with example?

b) What is meant process? Explain Process Control Block?

OR

***3)*** Explain Inter process Communication with example?

**UNIT - II**

***4)*** Describe FCFS and Round Robin scheduling algorithms with examples?

OR

***5)*** Explain Critical Section problem with example?

**UNIT - III**

***6)*** Explain pagging and segmentation with neat block diagrams?

OR

***7)*** Explain Dead Lock Avoidance and Recovery Techniques with suitable examples?

## UNIT - IV

***8)*** Explain different page replacement algorithms with examples?

OR

***9)*** Explain any three file access methods.

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# (DCS / DIT 312)

## B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## Computer Science & IT

## Paper - II : Systems Software

**Time : 3 Hours** **Maximum Marks : 75**

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***Answer question No.1 compulsory*** ***(15)***

***Answer any four questions from Part - B*** ***(4 × 15 = 60)***

**PART – A**

***1)*** Explain the following :

a) Assemblers.

b) Macro Instructions.

c) Relocating Loaders.

d) Buffer Headers.

e) Driver Interfaces.

**Part – B**

***2)*** Mention various Data formats for the system 360/370. Explain each one with examples.

OR

***3)*** Explain the implementation of the Macro processor within an assembler (pass 1).

***4)*** What are the various types of Loaders? Discuss about the Design of an Absolute loader.

OR

***5)*** Describe an algorithm used in the design of a direct - linking loader for an 1 BM system / 360 - type computer.

***6)*** Explain the scenarios for Retrieval of a buffer from buffer cache.

OR

***7)*** a) Explain in detail about UNIX Kernel.

b) Write a short note on structure of a Regular file.

***8)*** Explain about the Disk Drivers in I/O subsystem.

OR

***9)*** What is a system call? Discuss about various system calls used for file systems.

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# (DCS / DIT 313)

## B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## Computer Science & IT

## Paper - III : OPERATIONS RESEARCH

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 compulsory*** ***(15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** a) What is optimum solutions.

b) Initial Basic feasible solution.

c) Write standard form of L.P.P.

d) Explain slack variable.

e) Write about Dual simplex method.

f) Characteristics of queuing theory.

g) Characteristics of dynamic programming.

h) Explain two person zero-sum game.

i) Explain about saddle point.

j) Pay off matrix.

k) Max – min and min – max principle.

l) What PERT and CPM.

m) Degeneracy in transportation problem.

n) Explain the setup cost.

o) Explain the holding cost.

## UNIT – I

***2)*** a) Solve the LPP.

Max. $z = 4x_1 + 3x_2$

Subject to constraints

$2x_1 + x_2 \leq 72$

$x_1 + 2x_2 \leq 48,$

$x_1 \geq 0, x_2 \geq 0$

b) Solve the Linear programming problem by Graphical method.

Max. $z = 3x_1 + 2x_2$

Subject to constraints

$2x_1 - x_2 \geq -2$

$x_1 + 2x_2 \leq 8$

$x_1, x_2 \geq 0$

OR

***3)*** Use two – phase simplex method

$$\text{Max } z = 2x_1 + x_2 + \left(\frac{1}{4}\right)x_3$$

Subject to constraints

$4x_1 + 6x_2 + 3x_3 \leq 8$

$3x_1 - 6x_2 - 4x_3 \leq 1$

$2x_1 + 3x_2 - 5x_3 \geq 4$

$x_1, x_2, x_3, \geq 0$

## UNIT - II

***4)*** The transportation cost in rupees of an electronic equipment from a particular source to a particular destination is given with following matrix

Destination

| | | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Availability |
|---|---|---|---|---|---|---|
| Source | $S_1$ | 10 | 8 | 11 | 7 | 200 |
| | $S_2$ | 9 | 12 | 14 | 6 | 400 |
| | $S_3$ | 8 | 9 | 12 | 10 | 350 |
| | Demana | 160 | 180 | 310 | 300 | |

OR

***5)*** Solve the following travelling salesman problem given by the following data.

$d_{12} = 20$, $d_{13} = 4$, $d_{14} = 10$, $d_{23} = 5$, $d_{34} = 6$, $d_{25} = 10$, $d_{35} = 6$, $d_{45} = 20$.

Also $d_{ij} = d_{ji}$ and there is no route between cities i and j if a value for $d_{ij}$ is not shown above.

## UNIT - III

***6)*** Ram industry needs 5,400 units/year of a bought – out component which will be used in its main product. The ordering cost is Rs. 250 per order and the carrying cost per unit per year is Rs. 30. Find the economic order quantity (EOQ), the number of orders per year and the time between successive orders.

OR

***7)*** Explain the following :

a) Quantity discounts.

b) ABC analysis of inventory.

## UNIT – IV

***8)*** The following table lists the jobs of a network along with their time estimates.

| Jobs | 1-2 | 1-3 | 2-4 | 3-4 | 4-5 | 3-5 |
|---|---|---|---|---|---|---|
| Optimistic time (a) | 2 | 9 | 5 | 2 | 6 | 8 |
| Pessimistic time (b) | 14 | 15 | 17 | 8 | 12 | 20 |
| Most likely time (m) | 5 | 12 | 14 | 5 | 6 | 17 |

a) Draw the network

b) Calculate expected duration of each activity.

c) Expected variance of each activity.

d) Expected variance of project length.

e) Find critical path.

OR

***9)*** Cars arrive at a petrol pump, having one petrol unit, in poision fashion with an average of 10 cars per hour. The service time is distributed exponentially with a mean of 3 minutes. Find

a) average number of cars in the system.

b) average waiting time in the queue.

c) average queue length.

d) the probability that the number of cars in the system is 2.

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# (DCS 314)

## B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE & IT

## Paper - IV : Design & Analysis of Algorithms

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 compulsory*** ***(15)***

***Answer ONE from each unit*** ***(4 × 15 = 60)***

***1)*** Write short notes on :

a) Performance analysis.

b) Control abstraction for divide & conquer.

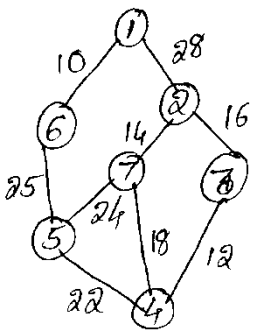
c) Flowshop scheduling.

d) Articulation point

e) Non Deterministic algorithms

**UNIT - I**

***2)*** Obtain minimum cost spanning tree for the given graph using Prim's algorithm.




OR

***3)*** Explain quick sort algorithm with example.

**UNIT - II**

***4)*** Write an algorithm of O/I knapsack problem in Dynamic programming, Also obtain optimal solution for the given knapsack instance :

$n = 3$, $(w_1, w_2, w_3) = (2, 3, 4)$, $(P_1, P_2, P_3) = (1, 2, 5)$ and $m = 6$.

OR

***5)*** Explain travelling sales person problem with example.

## UNIT - III

***6)*** Explain Graph coloring Algorithm and generate state space tree for mcoloring when n = 3 and m = 3.

OR

***7)*** Let n = 6, m = 30 and w[1 : 6] = {5, 10, 12, 13, 15, 18}. Find all possible subsets and generate state space tree using Sum of subsets algorithm.

## UNIT - IV

***8)*** Discuss about FIFO branch and band & LC branch and band.

OR

***9)*** State and prove cook's theorem.

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**(DCS 315)**

# B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the End of Third Year)

## COMPUTER SCIENCE & IT

## Paper - V : Database Management Systems

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 is compulsory*** ***(5 × 3 = 15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** Write short notes on :

a) E – R model

b) Relational Algebra

c) System Catalog

d) ACID properties.

e) SQL

**UNIT - I**

***2)*** Draw ER diagram for University and also convert ER diagram to tables?

OR

Explain Data abstraction and different levels of Data abstraction with neat sketch?

**UNIT – II**

***3)*** Explain Integrity constraints with examples?

OR

Explain Relational languages.

**UNIT – III**

***4)*** What is normalization? And also explain different normal forms with examples?

OR

a) Compare and contrast BCNF versus 3NF.

b) Explain Functional Dependency and multivalued dependency.

## UNIT - IV

***5)*** Explain

a) 2 phase hocking.

b) Strict 2PL

c) Hike hock

OR

Explain time stamp based concurrency control technique with example.

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**(DCS 321)**

# B.Tech DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE & IT

## Paper - I : Automata Theory & Formal Languages

**Time : 3 Hours** **Maximum Marks : 75**

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***Answer question No.1 compulsory*** ***(15 × 1 = 15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** a) What is the difference between NFA and DFA?

b) What is meant by Regular language?

c) Define pumping lemma.

d) What is the difference between regular grammar and context free grammar?

e) What is Chomsky normal form?

f) Write any two properties of CFLS.

g) Define pushdown Automata.

h) Define Finite State machine.

i) What is the use of MYHILL-NERODE Theorem?

j) What is meant by ambiguous grammar?

k) Define Tuning machine.

l) What is meant by recursively enumerable language?

Draw Transition Diagrams for the following regular expressions

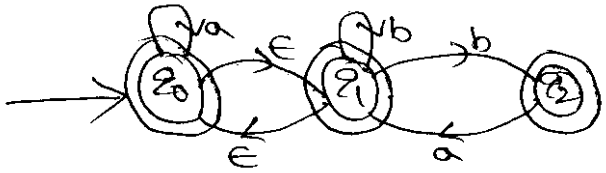
m) (a + b)* abb.

n) a(a + b)* ab.

o) (a + b)*a(a +b) (a + b).

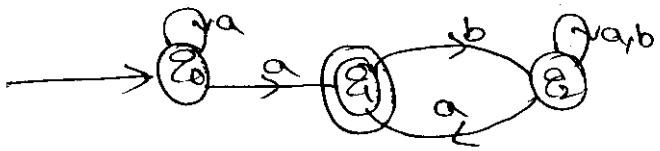
## UNIT - I

***2)*** Construct DFA for the following Transition Diagram.




OR

***3)*** a) Find out DFA for the following diagram.




b) Construct mod-3 counter using ternary representation.

## UNIT - II

***4)*** a) Define CFG. Write CFG for the language L = $\{0^n1^n \mid n \geq 1\}$

b) Consider the grammar S → aS|aSbS|∈

Is the above grammar ambiguous?

Show in particular that the string 'aab' has no :

i) Parse tree

ii) Leftmost derivation

iii) Rightmost derivation

OR

***5)*** a) Consider the grammar E → + EE*EE\–EE \x\y.

Find the leftmost and right most derivation for the string

'+*–xyxy' and write parse tree

b) Explain briefly the closure properties of regular sets.

## UNIT - III

***6)*** Convert the following grammar into GNF

E → E + T\T

T → T*F\F

F → (E)\a

OR

***7)*** Construct PDA for the language L ={w ⊂ $w^R$ | w∈(a + b)*, where $w^R$ is reverse of w}.

## UNIT - IV

***8)*** Design Tuning machine for the language $L = \{a^n b^n c^n / n > 1\}$

OR

***9)*** Discuss about :

a) Universal Tuning Machines.

b) Techniques of Tuning machine construction.

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**(DCS 322)**

# B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the End of Third Year)

## COMPUTER SCIENCE & IT

## Paper - II : Principles of Programming Languages

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 compulsory*** ***(5 × 3 = 15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** Write short notes on :

a) Programming Domains.

b) Language categories.

c) Records and unions.

d) Data abstraction.

e) Monitors.

**UNIT - I**

***2)*** a) Explain about various reasons for studying the programming language principles (or) concepts. **[8]**

b) What are various design issues that influence programming language design. **[7]**

OR

***3)*** Explain about primitive datatypes and type checking. **[15]**

**UNIT - II**

***4)*** Explain about Arrays and user-defined types. **[15]**

OR

***5)*** a) Explain Arithemetic Expressions, Relational and boolean Expressions. **[8]**

b) Explain various iterative statements. **[7]**

## UNIT - III

***6)*** Discuss overloaded sub-programs and design issues of functions. **[15]**

OR

***7)*** What is Abstraction? Discuss concepts encapsulation and Data. **[15]**

## UNIT - IV

***8)*** Explain semaphores, Monitors, message passing techniques? **[15]**

OR

***9)*** Explain exception handling in C++, Java. **[15]**

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# (DCS 323)

## B.Tech DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE & IT

## Paper - III : Software Engineering

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 compulsory*** ***(15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** Write short notes on :

a) Define software.

b) Explain process frame work.

c) What are planning practices.

d) What is a component?

e) Define software Quality.

**UNIT - I**

***2)*** a) Explain the changing nature of software. **[5]**

b) Explain about process Assessment. **[5]**

c) Explain about CMMI. **[5]**

OR

***3)*** a) Explain about Spiral Model. **[8]**

b) Explain about Software Requirements Document. **[7]**

**UNIT - II**

***4)*** a) Explain about Requirements Engineering tasks. **[8]**

b) Write the principles of modeling practices. **[7]**

OR

***5)*** Explain in detail about Class Based Modeling. **[15]**

## UNIT - III

***6)*** Explain in detail about Design Concepts of Software engineering. **[15]**

OR

***7)*** a) Explain the Golden Rules in detail. **[8]**

b) Differentiate between Graphical Design Notations and Tabular Design Notations. **[7]**

## UNIT - IV

***8)*** a) Differentiate between validation Testing and Verification Testing. **[8]**

b) Explain the metrics for Testing Product. **[7]**

OR

***9)*** a) Explain about Software Testing for Conventional Software. **[7]**

b) Explain about White Box and Black Box Testing. **[8]**

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**(DCS 324)**

# B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE

## Paper - IV : Data Communications

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 is compulsory*** ***(15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** Write a short notes on :

a) Protocol architecture.

b) NRZ – I.

c) Types of errors.

d) Sliding window protocol.

e) LANs.

**UNIT - I**

***2)*** Explain TCP/IP architecture with neat diagram.

OR

***3)*** Explain wireless transmission media in detail.

**UNIT - II**

***4)*** What are signal encoding techniques? Explain Biphase techniques in detail.

OR

***5)*** What is error detection method explain parity check method with an example.

**UNIT - III**

***6)*** Discuss the following in detail.

a) Time division multiplexing.

b) Code division multiplexing.

OR

***7)*** Explain stop-and-wait ARQ and Go-back-N ARQ protocols with diagrams.

## UNIT - IV

***8)*** Explain the key elements of LAN in detail.

OR

***9)*** Explain logical link control protocols with neat diagrams.

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**(DCS 325)**

# B.Tech DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE AND IT

## Paper - V : Computer Graphics

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 is compulsory*** ***(15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** Write short notes on :

a) Frame buffer

b) Display file structure

c) Display controllers

d) Segment table

e) Scaling transformations

**UNIT - I**

***2)*** Explain the following :

a) Display devices.

b) Vector generation.

OR

***3)*** a) Antialiasing.

b) How much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 640 × 480 and refresh rate of 60 frames per second.

**UNIT - II**

***4)*** Explain Mid point circle generating algorithm in detail.

OR

***5)*** Write in detail about inherent memory devices.

## UNIT - III

***6)*** Explain image transformation using segment table.

OR

***7)*** a) Polygon filling using Boundary filling method.

b) Scan line algorithm.

## UNIT - IV

***8)*** Explain Rotation about arbitary point using transformation matrices.

OR

***9)*** Define viewing transformation, Describe Suther land-Hodgeman algorithm for clipping polygons.

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# (DCS 326)

## B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Third Year)

## COMPUTER SCIENCE

## Paper - VI : Internet Programming

**Time : 3 Hours** **Maximum Marks : 75**

***Answer question No.1 compulsory*** ***(5 × 3 = 15)***

***Answer ONE question from each unit*** ***(4 × 15 = 60)***

***1)*** a) Explain the exception Handling mechanism with Example.

b) Write a Java program to keyboard event handling.

c) What is servlet and explain their components?

d) Explain the Java beans and their properties.

e) Write a Java program using multi thread.

**UNIT - I**

***2)*** a) What is inheritance? Explain the various types of inheritances with Example? **(8)**

b) What is the use of inter faces in Java programming language? **(7)**

OR

***3)*** a) What is method over riding? Explain their disadvantages and which key are used to solve the problem of method overriding? **(10)**

b) Discuss the method over loading? **(5)**

**UNIT - II**

***4)*** a) Explain the difference between standalone programs and Applet programs with suitable example? **(8)**

b) Write a Applet program to print "HAI" message? **(7)**

OR

***5)*** a) Write a Java program using check Boxes? **(7)**

b) Explain the AWT controls and their constructors with example? **(8)**

## UNIT - III

***6)*** a) How can you differentiate swing control elements from AWT control elements? **(8)**

b) Sketch diagram of JDBC driver? **(7)**

OR

***7)*** a) What is servlet and explain the Architecture? **(10)**

b) Explain problems in servlets? **(5)**

## UNIT - IV

***8)*** a) Explain the Java Beans and their methods. **(9)**

b) Explain the BDK Introspection. **(6)**

OR

***9)*** a) Write short notes on RMI? **(8)**

b) Discuss the networking concepts. **(7)**

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