DW 167

## Semester End Examination - Winter 2019-20

| | | | |
|---|---|---|---|
| Class - Program | Third Year B.Tech. (CS) | Day &Date | THU, 14/11/19 |
| Course Code | CSL305 | Time | to 10:00 to 1:00 |
| Course Title | System Programming | Max.Marks | 100 |

*Instructions :*

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not allowed.*

---

| Que No | | Question | Marks | BL | CO |
|---|---|---|---|---|---|
| 1 | A | Explain in detail fundamentals of language processing activities. | 8 | 2 | 1 |
| | B | Given the following source program<br><br>START 250<br>A DS 6<br>E MOVER AREG, B<br>ADD AREG, C<br>MOVEM AREG, D<br>D EQU A+3<br>F PRINT D<br>ORIGIN A-10<br>C DC '9'<br>ORIGIN D-7<br>STOP<br>B DC '6'<br>END<br><br>Show the contents of the symbol table at the end of Pass-I.<br><br>Show the Intermediate code generated for the program. (Variant I and variant II) | 7 | 3 | 2 |
| 2 | A | Given the following source program :<br>1) Show the contents of symbol table of single pass assembler.<br>2) Show the contents of FRT table | 8 | 3 | 2 |

| Sr.No. | | Statement | Offset |
|---|---|---|---|
| 001 | CODE | SEGMENT | |
| 002 | | ASSUME CS:CODE, DS:DATA | |
| 003 | | MOV AX, DATA | 0000 |
| 004 | | MOV DS,AX | 0003 |
| 005 | | MOV CX , LENGTH STRNG | 0005 |
| 006 | | MOV COUNT , 0000 | 0008 |
| 007 | | MOV SI, OFFSET STRNG | 0011 |
| 008 | | ASSUME ES:DATA, DS: NOTHING | |
| 009 | | MOV AX, DATA | 0014 |
| 010 | | MOV ES , AX | 0017 |
| 011 | COMP: | CMP [ SI ] , 'A' | 0019 |
| 012 | | JNE NEXT | 0022 |
| 013 | | MOV COUNT , 1 | 0024 |
| 014 | NEXT: | INC SI | 0027 |
| 015 | | DEC CX | 0029 |
| 016 | | JNE COMP | 0030 |

DW 167

PRN | QP Code -

| Que No | | Question | Marks | BL | CO |
|---|---|---|---|---|---|
| | | 017 CODE ENDS<br><br>018 DATA SEGMENT<br>019 ORG 1<br>020 COUNT DB ? 0001<br>021 STRNG DW 50 DUP (?) 0002<br>022 ENDS<br>023 END | | | |
| | | **Attempt any one of B & C** | | | |
| | B | What is IR? Prepare an IR by making front end analysis of following program P,<br>Q: integer;<br>R: real;<br>R: = P * Q; | 7 | 2 | 1 |
| | C | What is LPDT? Explain LEX & YACC with semantic specifications. | 7 | 2 | 1 |
| 3 | A | Given expression is a*b + c*d* (e + f) + c*d<br>1) Construct operand descriptor for above expression.<br>2) Write parsing and code generation action.<br>3) Construct expression tree and write the target code. | 8 | 3 | 3 |
| | B | Compare macro preprocessor and macro assembler?<br>Following is the macro definition:<br>Macro<br>CLEARMEM &X, &N, &REG = AREG<br>LCL &M<br>&M SET 0<br>MOVEREG &REG, = '0'<br>.MORE MOVEMEM &REG, &X + &M<br>&M SET &M+1<br>AIF (&M NE N) .MORE<br>MEND<br>Show the contents of the data structures like MDT, MNT, PNTAB, EVNTAB, SSNTAB etc. For the Call CLEARMEM AREA, 10 | 7 | 3 | 2 |
| 4 | A | Write a note on-<br><br>a) Nested Macro Calls with example.<br><br>b) Macro Expansion with example. | 8 | 2 | 2 |
| | | **Attempt any one of B & C** | | | |
| | B | What is code optimization? List & explain different optimizing transformations with example. | 7 | 2 | 3 |
| | C | What is memory binding? Explain different types of memory allocation techniques | 7 | 2 | 3 |
| 5 | | **Attempt any one ofA&B** | | | |
| | A | Explain program relocation & how to perform program relocation with example | 8 | 2 | 3 |
| | B | Explain with schematic absolute and direct linking loader | 8 | 2 | 3 |
| | | **Attempt any twoof C, D & E** | | | |
| | C | Explain Program Relocation algorithm. | 6 | 2 | 3 |
| | D | How Command Dialogs are implemented? | 6 | 2 | 4 |

DW 167

PRN

QP Code

| Que No | | Question | Marks | BL |
|---|---|---|---|---|
| | E | What steps are involved in execution of a program? Explain translated, linked & load time addresses with example | 6 | 2 |
| 6 | | **Attempt any one ofA&B** | | |
| | A | State and explain types of editors. Also explain design of editors | 8 | 1 |
| | B | What are the fundamental steps in program development? Explain in detail | 8 | 2 |
| | | **Attempt any twoof C, D & E** | | |
| | C | Explain debug monitors | 6 | 2 |
| | D | Explain Program linking algorithm with example | 6 | 2 |
| | E | Discuss about Self- Relocating programs | 6 | 2 |

---------- X ---------- X ----------

PRN

QP Code DW-118

# D.K.T.E. Society's TEXTILE AND ENGINEERING INSTITUTE, ICHALKARANJI.

*(An Autonomous Institute)*

## Semester End Examination - Winter 2019-20

| | |
|---|---|
| Class - Program | Third Year B.Tech. (CS/IT) |
| Course Code | CSL303/ITL303 |
| Course Title | Machine Learning |

| | |
|---|---|
| Day & Date | Monday,11/11 /2019 |
| Time | 10:00 AM To 1:00 PM |
| Max.Marks | 100 |

***Instructions :***

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not allowed.*

---

**Que No 1 A** — Identify two clusters in following data using K-Mean Clustering Algorithm — Marks: 5 | BL: 3 | CO: 3

| Object | A | B | C | D | E |
|---|---|---|---|---|---|
| X1 | 25 | 35 | 75 | 81 | 87 |

**Attempt any one of B & C**

**B** — Dataset of Tennis game played between Federa and Nadel is given below. You are required to predict the winner of next match using the decision tree. Find the root node of the decision tree for given dataset — Marks: 10 | BL: 3 | CO: 3

| Time | Match_type | Court_surface | Outcome |
|---|---|---|---|
| Morning | Master | Grass | F |
| Afternoon | Grand_slam | Clay | F |
| Night | Friendly | Hard | F |
| Afternoon | Friendly | Mixed | N |
| Afternoon | Master | Clay | N |
| Afternoon | Grand_slam | Grass | F |
| Afternoon | Grand_slam | Hard | F |
| Afternoon | Grand_slam | Hard | F |
| Morning | Master | Grass | F |
| Afternoon | Grand_slam | Clay | N |
| Night | Friendly | Hard | F |
| Night | Master | Mixed | N |
| Afternoon | Master | Clay | N |
| Afternoon | Master | Grass | F |
| Afternoon | Grand_slam | Hard | F |
| Afternoon | Grand_slam | Clay | F |

Note: - Outcome F : Fadera Wins , Outcome N : Nadel Wins

**C** — Use data in Q.1 B to predict winner of the match for the attributes as Time = afterrnoon ,Match_type = Grand_slam and Court_surface = Hard, using Bayesian Classifier. — Marks: 10 | BL: 3 | CO: 3

**2** — **Attempt any three of A, B, C & D**

| | | Marks | BL | CO |
|---|---|---|---|---|
| A | Explain machine learning architecture? | 5 | 2 | 1 |
| B | Explain different types of machine learning techniques. | 5 | 2 | 1 |
| C | What is regression? Explain Different types of regression. | 5 | 2 | 1 |
| D | Derive equation for backpropagation technique in multilayer neural network. | 5 | 2 | 1 |

| Que No | | Question | Marks | BL | CO |
|---|---|---|---|---|---|
| 3 | | **Attempt any three of A, B, C & D** | | | |
| | A | Explain different types of recommender system. | 5 | 2 | 1 |
| | B | Explain cosine similarity technique. | 5 | 2 | 1 |
| | C | What are the merits and demerits of Decision tree. | 5 | 2 | 1 |
| | D | Explain the characteristics of time series. | 5 | 2 | 1 |
| 4 | A | i) Calculate linear regression parameters for following data. | 15 | 3 | 3 |

| X | Y |
|---|---|
| 7 | 22.5 |
| 9 | 19 |
| 11 | 34.5 |
| 13 | 41.2 |
| 15 | 46 |

ii) Find the nearest user of "Sanjay" using K-NN with K=1.

| User/Movie | Airlift | Fantush | Hera Pheri | Welcome | Parmanu |
|---|---|---|---|---|---|
| Sanjay | 4 | 3 | 5 | 3 | 0 |
| Ajit | 0 | 3 | 5 | 4 | 4 |
| sunil | 2 | 3 | 5 | 0 | 0 |
| Amit | 0 | 4 | 4 | 4 | 4 |
| Dinesh | 3 | 4 | 5 | 3 | 0 |

iii) Create two groups from following students using Agglomerative Hierarchical Clustering.

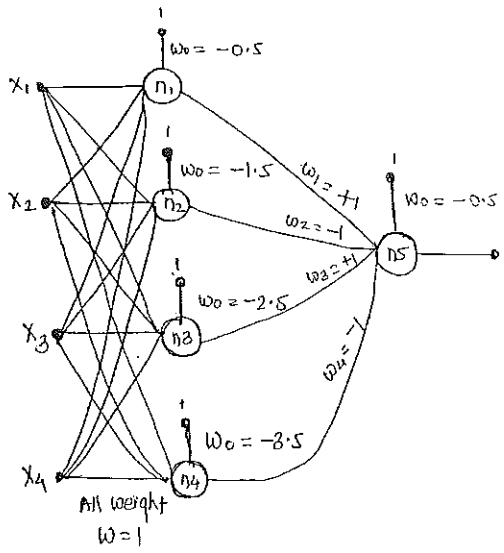
| Student | A | B | C | D | E |
|---|---|---|---|---|---|
| Marks | 35 | 45 | 48 | 67 | 71 |

| 5 | | **Attempt any two of A, B & C** | | | |
|---|---|---|---|---|---|
| | A | Following table provides data used for linear regression having input as "Study Hours" and out as "Marks". | 10 | 4 | 2 |

| Study Hours | Marks |
|---|---|
| 10 | 50 |
| 12 | 55 |
| 15 | 60 |
| 20 | 70 |
| 25 | 77 |
| 30 | 95 |

There are two sets of regression parameters, one with W0 = 15.75 and W1= 3.07 and second set contains W0 = 16.75 and W1 = 3.3. Which parameter set out of these are best? Why?

| | | | | | |
|---|---|---|---|---|---|
| | B | Analyze the following Artificial Neural Network with every neuron having "hardlimit" Thresholding function and determine the operation it has implemented. | 10 | 4 | 2 |

| Que No | | Question | Marks | BL | CO |
|---|---|---|---|---|---|
| | |   | | | |
| | C | Following table gives the result of an email classification system. | 10 | 4 | 2 |

| Sr. No. | Actual Email class | Predicted email class |
|---|---|---|
| 1 | N | N |
| 2 | N | N |
| 3 | S | N |
| 4 | S | S |
| 5 | S | S |
| 6 | S | S |
| 7 | N | N |
| 8 | N | N |
| 9 | S | N |
| 10 | S | S |
| 11 | N | N |

Find the performance of this system.
Is this system useful or Not? Why?

| | | | | | |
|---|---|---|---|---|---|
| 6 | | **Attempt any four of A, B, C, D & E** | | | |
| | A | What are the reasons of incorporating recommender system in information systems? | 5 | 2 | 1 |
| | B | What is Time series? Explain different techniques used to make time series prediction | 5 | 2 | 1 |
| | C | Explain Bayesian Classifier. | 5 | 2 | 1 |
| | D | Explain activation functions used in an artificial neural network. | 5 | 2 | 1 |
| | E | What is Feature Engineering? What are the steps in Feature Engineering? | 5 | 2 | 1 |

---------- X ---------- X ----------

| PRN | | QP Code |
|---|---|---|

**D.K.T.E. Society's TEXTILE AND ENGINEERING INSTITUTE, ICHALKARANJI.**

*(An Autonomous Institute)*

**Semester End Examination – Winter 2019-20**

| Class - Program | Third Year B.Tech. (CS) | Day &Date | 16/11/19 |
|---|---|---|---|
| Course Code | CSL304 | Time | 10:30 To 1:30 |
| Course Title | Information Security | Max.Marks | 100 |

***Instructions :***

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not allo*

| Que No | | Question | Marks | B |
|---|---|---|---|---|
| 1 | A | Perform encryption on given text using following substitution techniques with explanation.<br>"ATTACK IS POSTPONED"<br>a. Caesar Cipher with key=4<br>b. Monoalphabetic substitution | 8 | |
| | B | Describe OSI security architecture in detail. | 7 | |
| 2 | A | Explain single round of DES algorithm with block diagram. | 8 | |
| | | **Attempt any one of B & C** | | |
| | B | Consider the Diffie Hellman scheme with a common prime q=11 & primitive root $\alpha$ = 2. Given Ya=3, Find Xa and Yb=9 find Secret key K | 7 | |
| | C | Explain RSA algorithm in detail with suitable example | 7 | |
| 3 | A | What are the four ways to distribute public keys | 8 | |
| | B | What is basic use of message authentication code(MAC) | 7 | |
| 4 | A | Explain the properties and requirements of Digital signatures. Also explain different types of digital signatures. | 8 | |
| | | **Attempt any one of B & C** | | |
| | B | Give details of Kerberos Authentication protocol (KV4) with neat diagram | 7 | |
| | C | Explain X.509 CA hierarchy. What are the reasons for Certificates revocation? | 7 | |
| 5 | | **Attempt any one ofA&B** | | |
| | A | User A wish to communicate securely with user B through email. Explain PGP message generation in detail for the same? | 8 | |
| | B | Explain S/MIME certificate processing | 8 | |
| | | **Attempt any twoof C, D & E** | | |
| | C | Explain IP security architecture | 6 | |
| | D | Define Replay attacks and List its types. | 6 | |
| | E | Explain IPSec ESP format | 6 | |
| 6 | | **Attempt any one ofA&B** | | |
| | A | Explain Secure Electronic Transaction protocol (SET) | 8 | |
| | B | Define session state parameters and connection state parameters | 8 | |
| | | **Attempt any twoof C, D & E** | | |
| | C | Explain SSL record format | 6 | |
| | D | Explain the SSL handshake protocol in detail | 6 | |
| | E | List Web Security Threats. | 6 | |

| PRN | |
|---|---|

QP C

# D.K.T.E. Society's TEXTILE AND ENGINEERING INSTITUTE, ICHALKARANJI.

*(An Autonomous Institute)*

## Semester End Examination - Winter 2019-20

| Class - Program | Third Year | B.Tech. | (CS) |
|---|---|---|---|
| Course Code | CSL311 | | |
| Course Title | Operating System-II | | |

| Day & Date | MON 5/11/ 2 |
|---|---|
| Time | 10:AM to |
| Max.Marks | 100 |

***Instructions :***

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not*

| Que No | | Question | Marks |
|---|---|---|---|
| 1 | A | Enlist Scenarios for retrieval of a buffer. Explain Scenario no. 3 in detail | 8 |
| | B | Draw and Explain block diagram of System Kernel | 7 |
| 2 | A | Explain algorithm for allocation of in-core inodes | 8 |
| | | **Attempt any one of B & C** | |
| | B | Explain structure of regular file | 7 |
| | C | Explain algorithm for freeing inode | 7 |
| 3 | A | Draw the data structure of File system when following system calls are executed: Close(fd2) | 8 |
| | B | Draw the data structure of File system when following system calls are executed<br>fd1 = open ("/etc/ passwd", 0_RDONLY);<br>fd2 = open ("local", 0_RDONLY);<br>fd1 = open ("/etc/ passwd", 0_RDONLY); | 7 |
| 4 | A | Draw and explain process state transition diagram | 8 |
| | | **Attempt any one of B & C** | |
| | B | Explain Detaching a process from region | 7 |
| | C | Explain Allocating region | 7 |
| 5 | | **Attempt any one of A & B** | |
| | A | Explain process creation with algorithm | 8 |
| | B | Explain algorithm for process scheduling | 8 |
| | | **Attempt any two of C, D & E** | |
| | C | Explain various system call for time | 6 |
| | D | Explain algorithm for booting the system | 6 |
| | E | Write a short note on User id of process | 6 |
| 6 | | **Attempt any one of A & B** | |
| | A | Explain driver interfaces in detail | 8 |
| | B | Explain algorithm for allocating space from maps(malloc) with example | 8 |
| | | **Attempt any two of C, D & E** | |
| | C | Explain Demand Paging in detail | 6 |

| PRN | |
|---|---|

QP Co

# D.K.T.E. Society's TEXTILE AND ENGINEERING INSTITUTE, ICHALKARANJI.

*(An Autonomous Institute)*

## Semester End Examination - Winter 2019-20

| Class - Program | Third Year B.Tech. (CS) |
|---|---|
| Course Code | CSL-301 |
| Course Title | Operating System-I |

| Day &Date | Wed , |
|---|---|
| Time | to 10 t |
| Max.Marks | 100 |

***Instructions :***

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not*

| Que No | | Question | Marks |
|---|---|---|---|
| 1 | A | What do you mean by system call? Discuss different types of system calls and system call parameters with example. | 8 |
| | B | Illustrate the concept of Operating system from user and system view. Explain the relation of four major components of operating system with diagram | 7 |
| 2 | A | Assume there are 6 processes with id, burst time and arrival time as shown below<br>PID / Arrival Time / Burst Time<br>P1 / 0 / 4<br>P2 / 1 / 5<br>P3 / 2 / 2<br>P4 / 3 / 1<br>P5 / 4 / 6<br>P6 / 5 / 3<br>Apply a) SJF and b) RR scheduling algorithm with Time Quantum =2 to calculate Turnaround time, Waiting time and Average waiting time for the processes. | 8 |
| | | **Attempt any one of B & C** | |
| | B | What is the job of CPU scheduler? Explain primitive and Non-primitive scheduling with suitable example. | 7 |
| | C | What is inter-process communication in operating system? Draw and explain two fundamental models of inter-process communication | 7 |
| 3 | A | What is critical section problem? What are the three requirements for critical section problem? Write and explain Peterson's solution for critical section. | 8 |
| | B | What is semaphore? Discuss Readers- Writers problem and its solution using semaphore | 7 |
| 4 | A | Describe the FIFO and LRU page replacement algorithms, assuming there are 3 frames and the page reference string is<br>7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1<br>Find the number of page faults and page hits in both the cases. | 8 |
| | | **Attempt any one of B & C** | |
| | B | What is paging? Explain demand paging scheme of memory management in detail with its advantages and disadvantages | 7 |
| | C | Write and explain the concept of Translation Look-aside Buffer (TLB)in Paging | 7 |
| 5 | | **Attempt any one ofA&B** | |
| | | explain various file attributes and file operations in detail. | 8 |

PRN

QP Code -

| Que No | | Question | Marks | BL | CO |
|---|---|---|---|---|---|
| 5 | D | Write note on file system mounting | 6 | 2 | 3 |
| | E | Explain the following<br>i) file access methods ii) file locks | 6 | 2 | 3 |
| 6 | | **Attempt any one ofA&B** | | | |
| 6 | A | What is the role of operating system in computer I/O? Draw and explain a typical PC bus structure in detail | 8 | 2 | 4 |
| | B | What is DMA? Explain the steps in DMA transfer with suitable diagram. | 8 | 2 | 4 |
| | | **Attempt any twoof C, D & E** | | | |
| | C | Draw and explain the interrupt driven I/O system in detail | 6 | 2 | 4 |
| | D | How many registers are available on I/O port? Explain each in detail. | 6 | 2 | 4 |
| 6 | E | Write note on<br>a) memory mapped I/O<br>b) Buffering<br>c) Interrupt I/O | 6 | 2 | 4 |

---------- X ---------- X ----------

| PRN | | QP |
|---|---|---|

**D.K.T.E. Society's TEXTILE AND ENGINEERING INSTITUTE, ICHALKARANJI.**

*(An Autonomous Institute)*

**Semester End Examination - Winter 2019-20**

| Class - Program | Third Year B.Tech. (CS) | Day & Date | FRI |
|---|---|---|---|
| Course Code | CSL302 | Time | 10 ooto |
| Course Title | Database Engineering | Max.Marks | 100 |

***Instructions :***

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not*

| Que No | | Question | Marks |
|---|---|---|---|
| 1 | A | Write SQL queries to perform following tasks on given schema.<br>Flights (flno: integer, frm: string, to: string, distance: integer, departs: time, arrives: time, price: integer)<br>Aircraft (aid: integer, aname: string, cruisingrange: integer)<br>Certified (eid: integer, aid: integer)<br>Employees (eid: integer, ename: string, salary: integer)<br><br>1] Find the names of pilots certified for some Boeing aircraft.<br>2] Find the names of aircraft such that all pilots certified to operate them earn more than 80,000.<br>3] Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.<br>4] For each pilot who is certified for more than three aircraft, find the eid and the maximum Cruisingrange of the aircraft that he (or she) is certified for.<br>5] Print the name and salary of every non pilot whose salary is more than the average salary for pilots<br>6] Print the enames of pilots who can operate planes with cruisingrange greater than 3,000 miles, but are not certified on any Boeing aircraft | 8 |
| | B | List and Explain different constraints which can be applied on attributes in relational database management system. | 7 |
| 2 | A | Draw E-R diagram for college database, with following assumptions.<br>A college contains many departments. Each department can offer any number of courses. Many instructors can work in a department. An instructor can work only in one department. For each department there is a Head. An instructor can be head of only one department. Each instructor can take any number of courses. A course can be taken by more than one instructor. A student can enrol for any number of courses. Each course can have any number of students. | 8 |
| | | **Attempt any one of B & C** | |
| | B | Describe Database System Structure. | 7 |
| | C | What are the different data models? | 7 |

PRN

QP Code Dw

| Que No | | Question | Marks | BL |
|---|---|---|---|---|
| 4 | A | Compare Static Hashing with Dynamic Hashing. | 8 | 4 |
| | | **Attempt any one of B & C** | | |
| | B | Explain B tree indexing with example. | 7 | 2 |
| | C | Explain B+ tree indexing with example. | 7 | 2 |
| 5 | | **Attempt any one of A & B** | | |
| | A | Apply different applicable normal forms on the schema given in un-normalized form.<br>Employee (Employee_ID, Employee_Name, City, Department_No, Department_Name, Salary_Slip_no, Salary)) | 8 | 3 |
| | B | Find closure of set of functional dependency (F+) and Canonical Cover (Fc) from given set of functional dependencies (F) on schema (A, B, C)<br>F={ A → BC, B → C, A → B, AB → C} | 8 | 3 |
| | | **Attempt any two of C, D & E** | | |
| | C | Explain Boyce Codd Normal Form (BCNF) with example. | 6 | 2 |
| | D | Explain Fourth Normal Form (4NF) with example. | 6 | 2 |
| | E | Explain different types of functional dependencies with example. | 6 | 2 |
| 6 | | **Attempt any one of A & B** | | |
| | A | Explain Timestamp-Based Protocols for concurrency control. | 8 | 2 |
| | B | Explain Optimistic concurrency control Protocol. | 8 | 2 |
| | | **Attempt any two of C, D & E** | | |
| | C | Draw and Explain abstract transaction model. | 6 | 2 |
| | D | Explain Conflict Serializability with example. | 6 | 2 |
| | E | Explain View Serializability with example. | 6 | 2 |

---------- X ---------- X ----------