Total No. of Questions: 6 *Total No. of Printed Pages:3*

50+

Enrollment No. EN21CS304039

Faculty of Engineering

End Sem Examination May-2023

CS3CO39 / CS3CO25 Database Management Systems

Programme: B.Tech. Branch/Specialisation: CSE All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. What is information about data called? **1**

(a) Hyper data (b) Tera data

(c) Meta data (d) Relations

ii. Which of the following is known as a set of entities of the same type that share same properties, or attributes? **1**

(a) Relation set (b) Tuples

(c) Entity set (d) Entity Relation model

iii. What does an RDBMS consist of? **1**

(a) Collection of Records (b) Collection of Keys

(c) Collection of Tables (d) Collection of Fields

iv. Which command is used to remove a relation from an SQL? **1**

(a) Drop table (b) Delete (c) Purge (d) Remove

v. Third normal form is based on the concept of _____. **1**

(a) Closure Dependency (b) Transitive Dependency

(c) Normal Dependency (d) Functional Dependency

vi. Consider a relation R(A, B, C, D) with the following functional dependencies: **1**

A → (B, C, D), (A, D) → (B, C) and (C, D) → (A, B).

What is/are the candidate key(s)?

(a) (A, CD) (b) (AC, A) (c) (CD, BCD) (d) None of these

vii. As part of concurrency control protocols, the concurrent execution of database transactions will be _____, durable, and serializable. **1**

(a) Atomic (b) Consistent (c) Isolated (d) All of these

P.T.O.

viii. A transaction completes its execution is said to be _____. 1
(a) Commit (b) Rollback (c) Backup (d) None of these

ix. Which of the following are steps in query processing? 1
(a) Parsing and translation (b) Optimization
(c) Evaluation (d) All of these

x. What is the purpose of index in sql server? 1
(a) To enhance the query performance
(b) To provide an index to a record
(c) To perform fast searches
(d) All of these

Q.2 i. What do you mean by DBMS? Also mention its applications. 2

ii. What are the main differences between a file processing system and a DBMS? 3

iii. Discuss the three-level architecture of database system. 5

OR iv. Explain the concept of specialization and generalization with respect to database and also draw the E-R diagram for the same. 5

Q.3 i. What do you understand by cursor? Explain with suitable example. 2

ii. Explain at least 4 DDL & 4 DML commands along with syntax and example. 8

OR iii. Consider the relational database given below: 8
employee (person-name, street, city)
works (person-name, company-name, salary)
company (company-name, city)
manages (person-name, manager-name)
Give an expression in the relational algebra to express each of the following queries:
(a) Find the names of all employees who work for First Bank Corporation.
(b) Find the names and cities of residence of all employees who work for First Bank Corporation.
(c) Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.
(d) Find the names of all employees in this database who live in the same city as the company for which they work.

Q.4	i.	What is Normalization? What are the advantages of Normalization?	3
	ii.	Explain the different normal forms with suitable examples?	7
OR	iii.	Consider a relation R(A, B,C,D,E) with the following functional dependencies is given: $A \rightarrow B$, $C \rightarrow B$, $B \rightarrow E$, $E \rightarrow D$ and decomposition of R into R1(A,B,C) and R2(B,D,E). (a) Does this decomposition have the lossless join property? Is it possible to reconstruct R from R1 and R2 using Natural Join? Give reason for you answer? (b) What is/are the candidate key(s) of R?	7
Q.5	i.	What is Transaction Processing System? Also explain the commands used in Transaction Control Language.	4
	ii.	What do you Understand by ACID properties? Explain the different states of transaction with suitable diagram.	6
OR	iii.	Explain these two: (a) Locking Protocols, (b) Conflict and View serializability.	6
Q.6		Attempt any two:	
	i.	Describe data warehousing and also explain the data mining steps.	5
	ii.	What do you understand by distributed databases, web and mobile database?	5
	iii.	What are the different steps involved in query processing and optimization? Explain in detail.	5

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s (b) Collection of Keys

Total No. of Questions: 6 *Total No. of Printed Pages:4*

Enrollment No. EN21CS304039

507

Faculty of Engineering
End Sem Examination May-2023
CS3CO36 / CS3CO09 Operating Systems

Programme: B.Tech. Branch/Specialisation: CSE /All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. To avoid the race condition, the number of processes that may be simultaneously inside their critical section is- 1

(a) 0 (b) 1 (c) 2 (d) Any number of processes

ii. In the non-blocking send _____. 1

(a) The sending process keeps sending until the message is received

(b) The sending process sends the message and resumes operation

(c) The sending process keeps sending until it receives a message

(d) None of these

iii. An edge from process Pi to Pj in a wait for graph indicates that? 1

(a) Pi is waiting for Pj to release a resource that Pi needs

(b) Pj is waiting for Pi to release a resource that Pj needs

(c) Pi is waiting for Pj to leave the system

(d) Pj is waiting for Pi to leave the system

iv. What is dispatch latency? 1

(a) The time taken by the dispatcher to stop one process & start another

(b) The time taken by the processor to write a file into disk

(c) The whole time taken by all processor

(d) None of these

v. If the size of logical address space is 2 to the power of m, and a page size is 2 to the power of n addressing units, then the high order _____ bits of a logical address designate the page number, and the _____ low order bits designate the page offset. 1

(a) m, n (b) n, m

(c) m – n, m (d) m – n, n

P.T.O.

vi. Physical memory is broken into fixed-sized blocks called? 1
(a) Frames (b) Pages
(c) Backing store (d) None of these

vii. A process is thrashing if _____. 1
(a) It spends a lot of time executing, rather than paging
(b) It spends a lot of time paging than executing
(c) It has no memory allocated to it
(d) None of these

viii. Applying the LRU page replacement to the following reference string. 1
1 2 4 5 2 1 2 4
The main memory can accommodate 3 pages and it already has pages 1 and 2. Page 1 came in before page 2.
How many page faults will occur?
(a) 2 (b) 3 (c) 4 (d) 5

ix. The heads of the magnetic disk are attached to a _____ that moves all the heads as a unit. 1
(a) Spindle (b) Disk arm (c) Track (d) None of these

x. To create a file _____. 1
(a) Allocate the space in file system
(b) Make an entry for new file in directory
(c) Allocate the space in file system & make an entry for new file in directory
(d) None of these

Q.2 i. Write the difference between process and thread. 2
ii. Explain any three types of operating system. 3
iii. Describe Inter-process communication along with its two models. 5
OR iv. Write short note on: 5
(a) Critical section (b) Operations on processes

Q.3 i. What is deadlock? Explain different conditions of deadlock. 4
ii. Consider a system with three processes and three resource types and at time to the following snapshot of the system has been taken: 6

Process	Allocated			Maximum			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	2	2	3	3	6	8	7	7	10
P2	2	0	3	4	3	3			
P3	1	2	4	3	4	4			

(a) Is the current allocation a safe state? Deduce safe sequence using Banker's Algorithm.
(b) Would the request (1,0,0) be granted for process P2?

OR iii. Assume you have the following jobs to execute with one processor, with the jobs arriving in the order listed here: 6

Process	Arrival time	Burst Time(ms)
P1	0	80
P2	10	20
P3	10	10
P4	80	20
P5	85	50

Suppose a system uses RR scheduling with a quantum of 15 (ms).
(a) Create a Gantt chart illustrating the execution of these processes.
(b) What is the turnaround time for process P3?
(c) What is the average waiting time for the processes?

Q. 4 i. Define external and internal fragmentation with neat and clean diagram. 3
ii. Explain Paging and Solve Logical address space =128KB, Physical address space =512KB, and page size =16KB, 7
Calculate:
(a) Number of Bits for Logical Address (LA)
(b) Number of Bits for Physical Address (PA)
(c) Number of Pages in LAS or process
(d) Number of Frames in main memory or PAS
(e) Page Table size
OR iii. Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB, 750 KB, and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB, 500 KB, 358 KB, 200 KB, and 375 KB (in order) in fixed size partitioning? 7

Q.5 i. Define Thrashing with diagram. 2
ii. Explain the role of operating system in Security. 3
iii. Given page reference string: 5
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6
Compare the number of page faults for LRU, FIFO and Optimal page replacement algorithm.

P.T.O.

OR iv. Write short note on: (4)
(a) Demand Paging
(b) Virtual memory

Q.6 i. Describe at least two file operations. (4)
ii. Discuss in detail any two free space management schemes.
OR iii. Explain following disk scheduling algorithms: (6)
(a) SSTF (b) SCAN (c) C-SCAN

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45

Total No. of Questions: 6 Total No. of Printed Pages: 2

Enrollment No. EN21CS304039

Faculty of Engineering
End Sem Examination May-2023
CS3CO35 Microprocessor & Interfacing

Programme: B.Tech. Branch/Specialisation: CSE/All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Which of the following is true about microprocessors? 1

(a) It has an internal memory
(b) It has interfacing circuits
(c) It contains ALU, CU, and registers
(d) It uses Harvard architecture

ii. Which of the following flag is used to mask INTR interrupt? 1

(a) Zero flag (b) Auxiliary carry flag
(c) Interrupt flag (d) Sign flag

iii. Which of the following is a special-purpose register of microprocessor? 1

(a) Program counter (b) Instruction register
(c) Accumulator (d) Temporary register

iv. How many address lines are present in 8086 microprocessors? 1

(a) 16 (b) 20 (c) 32 (d) 40

v. Which of the following is true about MOV A, B instruction? 1

(a) It means move the content of register A to register B
(b) It uses immediate addressing mode
(c) It doesn't affect the flag register
(d) It is a 2-byte instruction

vi. ISR stand for- 1

(a) Interrupt save routine (b) Interrupt service routine
(c) Input stages routine (d) Interrupt service routing

vii. Which is a type of microprocessor that is designed with limited number of instructions? 1

(a) CPU (b) RISC (c) ALU (d) MUX

P.T.O.

viii. How many 2k*8 ROM chips would be required to build a 16*8 memory system? 1

(a) 2 (b) 4 (c) 8 (d) 16

ix. In stack organization the insertion operation is known as _____. 1

(a) Pop (b) Push

(c) Both (a) and (b) (d) None of these

x. In direct memory access mode, the data transfer takes place- 1

(a) Directly (b) Indirectly

(c) Directly and Indirectly (d) None of these

Q.2 i. What are flag register? Explain various flag registers of 8085. 3

ii. With neat diagram explain the architecture of 8085. 7

OR iii. With neat diagram explain the working of DMA controller. 7

Q.3 i. Differentiate between microprocessor and microcontroller. 3

ii. What are addressing modes in 8086? Discuss each with example. 7

OR iii. Explain the purpose of the following signals in 8085: 7

(a) READY (b) AD0-AD7 (c) HOLD (d) IO/ M

(e) INTR

Q.4 i. Discuss the importance of stack and subroutines in 8085 assembly language programming. 4

ii. Describe the classifications of instructions in the 8085-instruction set. Provide an example for each classification. 6

OR iii. Write an assembly language program to add two 8-bit numbers. 6

Q.5 Attempt any two:

i. Explain the difference between hardware interrupts and software interrupts. Give an example of each type. 5

ii. Compare and contrast the IO mapped I/O and memory-mapped I/O techniques. 5

OR iii. Draw the timing diagram for the instruction "MOV A, M" and explain the T-states and machine cycles involved. 5

Q.6 i. What is the intel architecture? 2

ii. Explain the architecture of the intel atom processor. Describe its features and capabilities. 8

OR iii. Describe the intel architecture and explain how an intel architecture System works. 8

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Enrollment No. EN21CS304039

Faculty of Engineering
End Sem Examination May-2023
CS3EL11 / IT3CO29
Statistical Analysis / Computational Statistics

Programme: B.Tech. Branch/Specialisation: CSE All / IT

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. If the first and third quartile of the distributions are 22.19 and 44.63 respectively, then the value of quartile deviation is equal to- **1**

(a) 22.44 (b) 11.22 (c) 66.82 (d) None of these

ii. The relation between Arithmetic Mean (A), Harmonic Mean (H) and Geometric Mean (G) is given by the formula- **1**

(a) $AH = G^2$ (b) $AH < G^2$ (c) $AH > G^2$ (d) None of these

10

iii. The probability function of a discrete random variable is as follows: **1**

$X = x$	0	1	2	3	4
$P(X = x)$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$

Then the expected value of random variable X i.e $E(X) =$ _____.

(a) 0 (b) 1 (c) 2 (d) None of these

iv. The value of k for the given probability density function **1**

$f(x) = \begin{cases} kx^2, & 0 \le x \le 3 \\ 0 & ,otherwise \end{cases}$ is-

(a) 1 (b) $\frac{1}{4}$ (c) $\frac{1}{9}$ (d) None of these

v. For a normal distribution, if $x = 0.748$, mean= 0.7515 and standard deviation = 0.002, then the standard normal variate is equal to **1**

(a) -1.75 (b) 1.75 (c) 0.5 (d) None of these

vi. In a Binomial Distribution, if mean is 4 and variance is 3, then number of trials $(n) =$ _____. **1**

(a) 18 (b) 16 (c) 12 (d) None of these

vii. If regression lines are perpendicular to each other, then the regression coefficients are- **1**

(a) Zero (b) Identical (c) Both (a) and (b) (d) None of these

P.T.O.

viii. Coefficient of Correlation lies between- 1

(a) $-3 \le r \le 3$ (b) $-2 \le r \le 2$

(c) $-1 \le r \le 1$ (d) None of these

ix. Which of the following test is used, if size of the sample is less than 30 ($n \le 30$)? 1

(a) Chi-square test (b) F-test

(c) Fisher's z-test (d) None of these

x. When we reject the null hypothesis H_0, though it is true, then it is known as _____. 1

(a) Type I error (b) Type II error

(c) Both (a) and (b) (d) None of these

Q.2 Attempt any two:

i. The following table gives the frequency distribution of married women by age at marriage: 5

Age (in years)	Frequency	Age (in years)	Frequency
15-19	53	40-44	9
20-24	140	45-49	5
25-29	98	50-54	3
30-34	32	55-59	3
35-39	12	60-64	2

Calculate the median.

ii. The expenditure of 100 families are given below: 5

Expenses in Rs	No. of families
0-10	14
10-20	?
20-30	27
30-40	?
40-50	15

The mode for the distribution is 24. Find the missing frequencies.

iii. Calculate the standard deviation and coefficient of variation for the following table. 5

Class	Frequency	Class	Frequency
0-10	5	40-50	30
10-20	10	50-60	20
20-30	20	60-70	10
30-40	40	70-80	5

Q.3 Attempt any two:

i. Define Random Variable, Probability Mass Function, Probability Density Function and Cumulative Distribution Function. 5

ii. In a college 25% students in Mathematics, 15% students in Physics and 10% students in Mathematics and Physics both are failed, A student is selected at random: 5

(a) If he is failed in Physics, then find the chance of his failure in Mathematics.

(b) If he is failed in Mathematics, then find the chance of his failure in Physics.

(c) Find the chance of his failure in Mathematics and Physics.

iii. If $f(x) = \begin{cases} 0 & , x < 2 \\ \frac{1}{18}(3 + 2x), & 2 \le x \le 4 \\ 0 , & x > 4 \end{cases}$ 5

Prove that it is a probability density function. Find the probability that a variate having this density will fall in the interval $2 \le x \le 3$.

Q.4 Attempt any two:

i. Fit a Poisson's Distribution to the following and calculate the expected theoretical frequencies. 5

x	0	1	2	3	4
f	122	60	15	2	1

ii. In a sample of 1000 cases, the mean of a certain test is 14 and the standard deviation is 2.5. Assuming the distribution to be normal, find: 5

(a) How many students score between 12 and 15?

(b) How many students score above 18?

(c) How many students score below 8?

Given $P(-0.8 < z < 0) = 0.2881$, $P(0 < z < 0.4) = 0.1554$, $P(0 < z < 1.6) = 0.4452$, $P(0 < z < -2.4) = 0.4918$

iii. Derive the mean and variance for a Binomial Distribution. 5

Q.5 Attempt any two:

i. If regression equation of y on x be $4x - 5y + 33 = 0$ and regression equation of x on y be $20x - 9y = 107$ are two lines of regression, then find the following: 5

(a) The mean values of x and y (b) The regression coefficients

(c) The correlation coefficient (d) The value of y for $x = 3$

(e) The standard deviation of x if the variance of x is 9

P.T.O.

ii. Fit a second-degree parabola to the following data: 5

x	1	1.5	2	2.5	3	3.5	4
y	1.1	1.3	1.6	2	2.7	3.4	4.1

iii. Calculate the Karl Pearson's coefficient of correlation between x and y for the following data: 5

x	23	27	28	28	29	30	31	33
y	18	20	20	27	21	29	27	29

Q.6 Attempt any two:

i. In a test examination given to two groups of students, the marks obtained were as follows: 5

First group: 18, 20, 36, 50, 49, 36, 34, 49, 41

Second group: 29, 28, 26, 35, 30, 44, 46

Examine the significance of difference between the arithmetic averages of the marks secured by the students of the above two groups. ($t_{0.05,14} = 2.14$)

ii. The following table gives a classification of a sample of 160 plants of their flower colour and flatness of leaf: 5

	Flat leaves	Coloured leaves	Total
White flower	99	36	135
Red flower	20	5	25
Total	119	41	160

Test whether the flower colours is independent of the flatness of leaves. (Given $\chi^2_{0.05,1} = 3.841$)

iii. A manufacturing company has purchased 3 new machines (A, B, C) of different makes and wishes to determine whether one of them is faster than the other in producing a certain item. From hourly production figures are observed at random from each machine and results are given below: 5

A	B	C
20	18	25
21	20	28
23	17	22
16	25	28
20	15	32

Use one –way ANOVA to test whether machines differ significantly. (Table value of F at 5% level for $v_1 = 2$ and $v_2 = 12$ is 3.89)

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Total No. of Questions: 6

Total No. of Printed Pages: 3

Enrollment No. EN21CS304039

Faculty of Engineering
End Sem Examination May-2023
CS3CO38 Theory of Computation

Programme: B.Tech. Branch/Specialisation: CSE / All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Which one is not a closure property of regular language? 1

(a) Union of regular language is regular
(b) Intersection of regular language is regular
(c) Reversal of regular language closed under regular
(d) None of these

ii. Pick the correct statement about Moore and Mealy machine: 1

(a) The output is function of input and current state in Moore machine
(b) The output is function of input and current state in Mealy machine.
(c) The length of output string is higher then length of input string in Mealy machine.
(d) The length of output string is lesser then length of input string in Moore machine.

iii. Transition function maps Q X Σ into 2^Q in which kind of automaton $M=(Q, \Sigma, \delta, q_0, F)$ 1

(a) Deterministic automaton
(b) Non-deterministic automaton
(c) All kind of finite state automaton
(d) None of these

iv. After accepting the string, the automaton 1

(a) Halt in any state (b) Halt in any non-final state
(c) Halt in final state (d) All of these

v. As per Chomsky hierarchy the type-2 is- 1

(a) Regular grammar (b) Context free grammar
(c) Context sensitive grammar (d) Unrestricted grammar

P.T.O.

vi. Which production is applicable in both CNF and GNF (Where A,B,C are non-terminal symbols, a is Terminal symbol)? 1
(a) A → a (b) A→ BC
(c) A → aB (d) None of these

vii. A pushdown automaton recognizes- 1
(a) Context free language
(b) Recursively enumerable language
(c) Recursive language
(d) All of these

viii. A pushdown automaton has- 1
(a) Only stack
(b) A tape, a controller and a stack
(c) A tape, A controller
(d) A tape and a stack

ix. The automaton which recognize context-sensitive languages is- 1
(a) Finite state automaton
(b) Pushdown automaton
(c) Linear bounded automaton
(d) All of these

x. In transition function δ(q,0) = (p, X, L) of Turing machine X and L are respectively- 1
(a) Input symbol and direction
(b) Input symbol and tape symbol
(c) Tape symbol and input symbol
(d) Tape symbol and direction

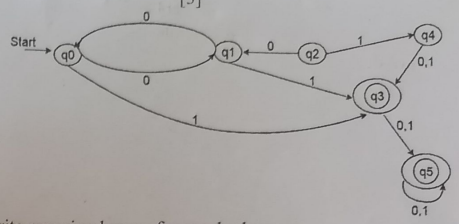
Q.2 i. Explain Kleen's star and Kleen's positive closure. Give example of each. 4

ii. (a) Define regular expression for regular language. 6
(b) Construct FSA for regular expression as given below:
R= ab+(b+aa)b*a

OR iii. Explain Moore Machine and Mealy machine with formal definition and diagram of each. 6

Q.3 i. Explain non-deterministic automaton with formal definition and transition diagram. 4

ii. Minimize FSA as given in figure. Also write tuples and draw transition diagram of minimized automaton. 6



OR iii. (a) Write pumping lemma for regular language. 6
(b) Use pumping lemma to prove that language L={$a^n b^n$; n >0) is not a regular language .

Q.4 i. Explain Chomsky Hierarchy with relationship diagram. 4

ii. (a) What is simplified grammar? 6
(b) Eliminate ε - production from following CFG and rewrite CFG.
G=({A,B,C,D},{a,b},P,S)
S→ ABCD
A→ Cda
B→ Cb
C→ a | ε
D → bD | ε

OR iii. What is grammar in CNF and in GNF? Explain each with example. 6

Q.5 i. Compare pushdown automaton with finite sate automaton. 4

ii. Construct a PDA for the following grammar 6
S → aB/B
B → aS /bS / a
and check the acceptability of string aabbb.

OR iii. Design Pushdown automaton for the following CFL. Also write its tuples and draw transition diagram. 6
L = { $a^n b^n c^m$ | n,m>=1 }

Q.6 Attempt any two:
i. Explain Turing machine with its formal definition. 5
ii. Explain recursive and recursively enumerable language. 5
iii. Design a Turing machine and Draw its transition diagram for the language which consist even number of a in {a,b}*. 5

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Total No. of Questions: 3

Enrollment No. EN21CS304039

Knowledge is Power

Faculty of Engineering

Mid Sem II Examination April -2023

CS3EL11/IT3CO29 Statistical Analysis/Computational Statistics

Programme: B.Tech. Branch/Specialisation: CS-All/IT

Duration: 1.5Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Which one of the distribution is discrete distribution a. Exponential distribution b. Normal Distribution c. Poisson Distribution d. None of these.	1	$BL_{01,2}$	CO_{01}	PO_{01}	$PSO_{02,03}$
	ii.	In which distribution, curve is symmetrical about mean a. Binomial distribution b. Exponential Distribution c. Poisson Distribution d. None of these.	1	$BL_{01,2}$	CO_{01}	PO_{01}	PSO_{02}
	iii.	"For any binomial distribution mean is 5 and standard distribution is 3". The above statement is a. False b. True c. Can't say d. None of these.	1	BL_{03}	CO_{02}	PO_{01}	PSO_{02}
	iv.	If $r = 1$, then correlation coefficient is a. perfect and positive b. Perfect and negative c. High degree and positive d. None of these.	1	$BL_{01,2}$	CO_{01}	PO_{01}	PSO_{02}
	v.	If $r = 0$, then the regression lines are a. Identical b. Perpendicular to each other c. Parallel to each other d. None of these.	1	$BL_{01,2}$	CO_{01}	PO_{01}	PSO_{02}

$y = ax + b$
$\Sigma y = am + b\Sigma x$
$\Sigma xy = a\Sigma x + b\Sigma x^2$

vi. The normal equation for fitting of a straight line $y = ax + b$ is $\sum xy =$ _____
a. $a\sum x + b\sum y$ b. $ma + b\sum x$
c. $a\sum x + b\sum x^2$ d. None of these. 1 $BL_{01,2}$ CO_{01} PO_{01} PSO_{03}

Q.2 i. Explain exponential distribution. 2 $BL_{01,2}$ CO_{01} PO_{01} PSO_{02}

ii. Six dice are thrown 729 times. How many times do you expect at least three dice to show a five or six? 3 BL_{02} CO_{02} $PO_{01,05}PSO_{02}$

iii. Find the first and second moment about origin for poisson distribution. 7 BL_{03} CO_{02} $PO_{01,05}PSO_{02}$

OR iv. In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and standard deviation of 60 hours. Estimate the number of bulbs likely to burn for
a. more than 2150 hours
b. less than 1950 hours. 7 BL_{03} CO_{02} $PO_{01,05}PSO_{02}$

Q.3 i. Write the equations of regression line. 2 $BL_{01,2}$ CO_{02} PO_{01} PSO_{02}

ii. Show that the coefficient of correlation is the geometric mean of the coefficient of regression. 3 BL_{03} CO_{02} PO_{01} PSO_{02}

iii. Find the rank correlation coefficient for the following data: 7 BL_{03} CO_{02} $PO_{01,05}PSO_{02}$

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

OR iv. Fit second degree parabola to the following data regarding x as an independent variable: 7 BL_{03} CO_{02} $PO_{01,05}PSO_{02}$

x:	0	1	2	3	4
y:	1	5	10	22	38

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3+.5+1.5
+2+2+
3+4

Total No. of Questions: 3

Enrollment No. EN21CS304039

Faculty of Engineering

Mid Sem II Examination April -2023

CS3CO37 Advanced Java Programming

Programme: B.Tech. Branch/Specialisation: CS-All

Duration: 1.5Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	What are the major components of the JDBC? a. DriverManager, Driver, Connection, Statement, and ResultSet b. DriverManager, Driver, Connection, and Statement c. DriverManager, Statement, and ResultSet d. DriverManager, Connection, Statement, and ResultSet.	1	BL2	CO3	PO1	
	ii.	Java code is embedded under which tag in JSP? a. Declaration b. Scriptlet c. Expression d. Comment	1	BL1	CO3	PO1	
	iii.	JSP uses server-side scripting that is translated into … and compiled before they are run. a. Applet b. Servlets c. HTML d. JavaScript	1	BL1	CO3	PO1	
	iv.	What is the main purpose of the Spring Framework? a. To provide a comprehensive programming and configuration model for Java-based enterprise applications. b. To provide a comprehensive programming and configuration model for JavaScript-based web applications. c. To provide a comprehensive programming and configuration model for PHP-based web applications. d. To provide a comprehensive programming and configuration model for Python-based web applications.	1	BL1	CO4	PO1	

v. Which interface out of the following options will you use to perform destruction of beans in the context of the life cycle methods? — 1 — BL1 CO4 PO2

a. Initializing Bean
b. Post Construct
c. Disposable Bean
d. Pre Destroy

vi. Spring is a _____ framework? — 1 — BL1 CO4 PO1

a. free
b. open source
c. under license
d. proprietary

JSP blocks.

Q.2	i.	What do you mean by API ?	2	BL1	CO3 PO1
	ii.	Explain JSP building blocks in detail?	4	BL1	CO3 PO1
	iii.	Write all the steps of java application with Database.	6	BL3	CO3 PO3
OR	iv.	Explain any five implicit object of JSP with HTML and JSP tag.	6	BL3	CO3 PO1
Q.3	i.	What do you mean by spring framework?	2	BL1	CO4 PO1
	ii.	What is the importance of the Container class in Java?	4	BL1	CO4 PO1
	iii.	What do you mean by dependency injection?	6	BL1	CO4 PO2
OR	iv.	Write the Difference between POJO and Bean.	6	BL2	CO4 PO2

*****

App^n prog. interface collection of classes interfaces & pre written packages with methods fields & constructors.

API in java is delivered by JDK.

4+2+2+4+2+4+2+6

Total No. of Questions: 3

Enrollment No. EN21CJ304039

MEDI-CAPS UNIVERSITY
Knowledge is Power

Faculty of Engineering

Mid Sem II Examination April - 2023

CS3CO35 Microprocessor & Interfacing

Programme: B.Tech. **Branch/Specialisation:** CS-All

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	The number of address bits that are present in Microprocessor 8085 are a. 8 b. 32 c. 64 d. 16	1	BL02	CO3	PO3, PO11	
	ii.	A memory system has a total of 8 memory chips each with 12 address lines and 4 data lines. The total size of the memory system is a. 16KB b. 32KB c. 48KB d. 64KB	1	BL02	CO3	PO3, PO11	
	iii.	How many types of system buses are connected to the 8085 microprocessor? a. 3 b. 5 c. 6 d. 4	1	BL02	CO3	PO3, PO11	
	iv.	How many machine cycles are required by the instruction LDA 3000H. a. 2 machine cycle b. 5 machine cycle c. 4 machine cycle d. 1 machine cycle	1	BL01	CO4	PO3, PO5, PO11	
	v.	Which of following is a non-maskable interrupt? a. RST 6.5 b. TRAP c. RST 7.5 d. INTR	1	BL02	CO4	PO3, PO5, PO11	

	vi.	Which of the following is non vectored interrupt? a. RST 7.5 b. INTR c. RST 4.5 d. TRAP	1	BL02	CO4	PO3, PO5, PO11
Q.2	i.	What do you mean memory interfacing? Give an example.	2	BL02	CO3	PO3
	ii.	Differentiate between Memory mapped I/O interfacing and I/O mapped I/O interfacing techniques.	4	BL02	CO3	PO3, PO11
	iii.	Draw the interfacing of 4K RAM having starting address of 7000H with 8085 Microprocessor. Use de-multiplexed address/data lines and 3:8 decoder.	6	BL02	CO3	PO3, PO11
OR	iv.	Draw and explain the programmable timer interface (Intel 8253/54) with 8085.	6	BL02	CO3	PO3, PO11
Q.3	i.	What is a machine cycle? Give an example.	2	BL02	CO4	PO3, PO11, PO5
	ii.	Explain maskable and non maskable interrupts with examples.	4	BL01	CO4	PO3, PO11, PO5
	iii.	Draw the timing diagram for Memory Read Operation in 8085.	6	BL02	CO4	PO3, PO11, PO5
OR	iv.	Draw the timing diagram for MOV A, B Instruction in 8085.	6	BL03	CO4	PO3, PO11, PO5

*****

machine cycle.

Time req to complete any op^n of accessing either memory / I/O i.e Subpart of an instruction.

3+1+4+3+1+4+4

Total No. of Questions: 3

Enrollment No. SC21CS301100

Faculty of Science/Engineering

Mid Sem II Examination April -2023

CA3CO12 Operating System

Programme: BCA/BCA+MCA | **Branch/Specialisation:** CA

Duration: 1.5 Hrs. | **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

		Marks	BL	CO	PO	PSO
Q.1	i. How many conditions are there in a deadlock (a) 3 (b) 4 (c) 5 (d) 6	1	BL_{02}	CO_1	PO1	
	ii. Banker's algorithm belongs to (a) deadlock prevention (b) deadlock avoidance (c) deadlock recovery (d) None of these	1	BL_{01}	CO_1	PO5	
	iii. Race condition can avoid through (a) Semaphore (b) Monitor (c) Mutex (d) all of these	1	BL_{02}	CO_1	PO5	
	iv. Run time mapping from virtual to physical address is done by ---------- (a) Memory Management Unit (b) CPU (c) PCI (d) None of these	1	BL_{02}	CO_2	PO5	
	v. Logical memory is broken into blocks of the same size called (a) pages (b) Frame (c) baking store (d) none of these	1	BL_{01}	CO2	PO1	
	vi. The solution of External Fragmentation is (a) compaction (b) larger size space (c) smaller size space (d) none of these.	1	BL_{02}	CO_2	PO1	

Total No.

need = max - allocation

Q.2	i.	What is critical section?	2	BL_{04}	CO_1 PO1
	ii.	Explain the Semaphore?	2	BL_{02}	CO_1 PO5
	iii.	Explain Readers –Writer's problem and give solution using Semaphore.	3	BL_{01}	CO_1 PO1
	iv.	Explain the all-necessary conditions for deadlock.	5	BL_{02}	CO_1 PO5
OR	v.	Consider the following snapshot of a system	5	BL_{02}	CO_1 PO1

work

	Allocation	Max	Available
	ABC	ABC	ABC
P1	010	753	332
P2	200	322	
P3	302	902	
P4	211	222	
P5	002	433	

Using the banker's algorithm, determine whether or not each of the following states is unsafe. If the state is safe, illustrate the order in which the process may complete.

need

if need ≤ work then work = work + allocn

Q.3	i.	What is Memory management in operating system	2	BL_{02}	CO_2 PO5
	ii.	Explain Paging and Segmentation.	4	BL_{01}	CO2 PO5
	iii.	Define fragmentation in detail	6	BL_{02}	CO_2 PO1
OR	iv.	Explain page replacement algorithm with suitable example.	6	BL_{02}	CO_2 PO1

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Memory mgmt:
functionality of OS that handles/ manages primary memory.

Mem. allocn

↓ contagious

↓ non contagious

V- 351 (30)

Total No. of Questions: 3

Enrollment No. EN21CS304039

Faculty of Engineering

Mid Sem II Examination April -2023

CS3CO39 Database Management System

Programme: B.Tech. Branch/Specialisation: CS-All

Duration: 1.5Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	4NF is designed to cope up with : a) Transitive dependency b) Join dependency c) Multi valued dependency d) None of these	1	BL01	CO3	PO01	
	ii.	5NF should restrict the..... : a) Transitive dependency b) Join dependency c) Multi valued dependency d) None of these	1	BL01	CO3	PO01	
	iii.	Data that causes inconsistency leads to: a) Data integrity b) Data redundancy c) Data anomaly d) Good data	1	BL01	CO3	PO01	
	iv.	Transaction enters into its _____ state when it finishes the final statement. a) Abort state b) Partially committed state c) Committed state d) Active state	1	BL01	CO4	PO01	
	v.	In locking Protocols what exclusive mode defines. a) Read only b) Write only c) Read and Write both d) None	1	BL01	CO4	PO01	

	vi.	A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set. a) Idle b) Waiting c) Deadlock d) Ready	1	BL01	CO4 PO01
Q.2	i.	Discuss problems caused by redundancy and the purpose of normalization.	2	BL02	CO3 PO02
	ii.	Define functional dependency and explain its uses in database design.	2	BL02	CO3 PO02
	iii.	What is key ? Explain the following keys with example : a) Candidate Key b) Primary Key c) Foreign Key	3	BL03	CO3 PO02
	iv.	Find all CANDIDATE KEYs and Prime and non-Prime attributes in the following relation: R(ABCDEFGH) FD: CH→G,A→BC,B→CFH ,E→A, F→EG	5	BL03	CO3 PO03
OR	v.	Find the all CANDIDATE KEY of the following: a) R(A,B,C,D) and FD={A→B,B→C,C→D} b) R(A,B,C,D) and FD={A→B,B→C,C→D,D→A}	5	BL03	CO3 PO03
Q.3	i.	Define a Transaction? List the properties of transactions and explain them.	3	BL01	CO4 PO01
	ii.	Draw a transaction state diagram and describe each state that a transaction goes through during its execution.	4	BL03	CO4 PO01
	iii.	What is the 2-phase locking protocol? How does it guarantee serializability?	5	BL02	CO4 PO03
OR	iv.	Explain the different types of failures in DBMS.	5	BL01	CO4 PO01

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Mid Sem II Examination April -2023

CS3CO38 Theory of Computation

Programme: B.Tech. Branch/Specialisation: CS-All

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Which of the following Language is Context free a. L= a^n, n is prime number b. L= a^nb^nc^m, n,m >=0 & n<=m c. L= a^nb^n n>=0 d. All of the above	1	BL_{01}	CO_{01}	PO3	PSO3
	ii.	Context free language is not closed under which operation a. Union b. Intersection c. Complement d. Reverse	1	BL_{02}	CO_{03}	PO3	PSO3
	iii.	Which of the following production rule violates the condition of GNF a. A->AB b. A->aBDG c. A->a d. A->bB	1	BL_{03}	CO_{03}	PO3	PSO3
	iv.	Consider the following statement I. CYK is a membership algorithm applied only on a grammar in CNF form. II. If a grammar G is ambiguous than language generated by G will also be ambiguous. III. There exist a deterministic PDA for every context free language IV. One of the applications of context free grammar exists in compilation of source programs from high level to low level language. Select the correct statement- a. I & II b. II & III c. I & IV d. I,II & IV	1	BL_{02}	CO_{04}	PO2	

	v.	Select the correct statement a. Each NPDA can be converted into equivalent DPDA b. Push down automata is equivalent to finite automata with memory in the form of input tape. c. NPDA is more powerful than DPDA d. None of the above	1	BL02	CO04	PO2
	vi.	Which of the following is not a context free language a. WcW, W is any string over a and b. b. WcW^r, W is any string over a and b,r denotes the reverse. c. WW^r, W is any string over a and b, r denotes the reverse. d. Language only contains the strings with balanced parentheses.	1	BL02	CO04	PO2
Q.2	i.	State whether the given context free grammar is ambiguous or unambiguous, S->A/B , A->aAb/ab , B->abB/ ε	3	BL02	CO03	PO3 PSO3
	ii.	Remove the unit production and null production rule from the given grammar S->AaB/AB/A A->aA/a B->b/bB/ ε	4	BL03	CO03	PO3 PSO3
	iii.	Explain the CYK algorithm with example?	5	BL02	CO03	PO3
OR	iv.	Explain the closure properties of context free language.	5	BL02	CO03	PO3
Q.3	i.	Explain the notion of acceptance in push down automata	3	BL01	CO04	PO2
	ii.	Define PDA with Tuples.	4	BL02	CO04	PO2
	iii.	Explain the conversion of context free grammar in to equivalent push down automata using below CFG S->aAB A->a B->bB/b	5	BL03	CO04	PO2
OR	iv.	Explain the pumping lemma for context free language with example	5	BL02	CO01	PO2

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Total No. of Questions: 3

Enrollment No. EN21CS304039

MEDI-CAPS UNIVERSITY
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Faculty of Engineering

Mid Sem I Examination March - 2023

CS3CO37 Advanced Java Programming

Programme: B.Tech. Branch/Specialisation: CSE

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Which of the following cannot be Type parameterized? • a) Overloaded Methods b) Generic methods c) Class methods d) Overriding methods	1	BL1	CO1	PO2	
	ii.	Which of this type of parameters is used for a generic class to return and accept any type of object? a) K b) N • c) T d) V	1	BL1	CO1	PO2	
	iii.	What is meant by the term generics? a) Class b) Structure c) Interface d) Parameterized types	1	BL1	CO1	PO1	
	iv.	Servlet are used to program which component in a web application? a) client b) server c) tomcat d) applet	1	BL2	CO2	P04	

v.	Which of the following is true about servlets? a) Servlets execute within the address space of web server b) Servlets are platform-independent because they are written in java c) Servlets can use the full functionality of the Java class libraries d) Servlets execute within the address space of web server, platform independent and uses the functionality of java class libraries	1	BL2	CO2	PO1
vi.	What type of protocol is HTTP? a) stateless b) stateful c) transfer protocol d) information protocol	1	BL2	CO2	PO1
Q.2	i. Explain the term Wildcards.	2	BL1	CO1	PO1
	ii. Define Generic class.	2	BL1	CO1	PO1
	iii. Define Lambda Expressions.	3	BL1	CO1	PO1
	iv. Differentiate between Upper bounded and lower bounded wildcards	5	BL1	CO1	PO2
OR	v. How to insert and delete elements from a LinkedList.	5	BL1	CO1	PO2
Q.3	i. What do you mean by web application?	2	BL2	CO2	PO1
	ii. Define any three HTTP methods.	4	BL2	CO2	PO1
	iii. Explain MVC design Pattern with example.	6	BL2	CO2	PO2
OR	iv. Explain servlet Listeners.	6	BL2	CO2	PO3

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3+1+2+2+
3+2+4+4

Total No. of Questions: 3

(30) V-351

Enrollment No. EN21CS304039

MEDI-CAPS UNIVERSITY
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Faculty of Engineering

Mid Sem II Examination April -2023

CS3CO38 Theory of Computation

Programme: B.Tech. Branch/Specialisation: CS-AII

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Which of the following Language is Context free a. L= a^n, n is prime number b. L= a^nb^nc^m, n,m >=0 & n<=m c. L= a^nb^n n>=0 d. All of the above	1	BL_{03}	CO_{03}	PO3	PSO3
	ii.	Context free language is not closed under which operation a. Union b. Intersection c. Complement d. Reverse	1	BL_{02}	CO_{03}	PO3	PSO3
	iii.	Which of the following production rule violates the condition of GNF a. A->AB b. A->aBDG c. A->a d. A->bB	1	BL_{03}	CO_{03}	PO3	PSO3
	iv.	Consider the following statement I. CYK is a membership algorithm applied only on a grammar in CNF form. II. If a grammar G is ambiguous than language generated by G will also be ambiguous. III. There exist a deterministic PDA for every context free language IV. One of the applications of context free grammar exists in compilation of source programs from high level to low level language. Select the correct statement- a. I & II b. II & III c. I & IV d. I,II & IV	1	BL_{02}	CO_{04}	PO2	

Faculty of ... mination March - 202...

	v.	Select the correct statement a. Each NPDA can be converted into equivalent DPDA b. Push down automata is equivalent to finite automata with memory in the form of input tape. c. NPDA is more powerful than DPDA d. None of the above	1	BL02	CO04	PO2	
	vi.	Which of the following is not a context free language a. WcW, W is any string over a and b. b. WcW^r, W is any string over a and b,r denotes the reverse. c. WW^r, W is any string over a and b, r denotes the reverse. d. Language only contains the strings with balanced parentheses.	1	BL02	CO04	PO2	
Q.2	i.	State whether the given context free grammar is ambiguous or unambiguous, S->A/B , A->aAb/ab , B->abB/ ε	3	BL02	CO03	PO3	PSO3
	ii.	Remove the unit production and null production rule from the given grammar S->AaB/AB/A A->aA/a B->b/bB/ ε	4	BL03	CO03	PO3	PSO3
	iii.	Explain the CYK algorithm with example?	5	BL02	CO03	PO3	
OR	iv.	Explain the closure properties of context free language.	5	BL02	CO03	PO3	
Q.3	i.	Explain the notion of acceptance in push down automata	3	BL01	CO04	PO2	
	ii.	Define PDA with Tuples.	4	BL02	CO04	PO2	
	iii.	Explain the conversion of context free grammar in to equivalent push down automata using below CFG S->aAB A->a B->bB/b	5	BL03	CO04	PO2	
OR	iv.	Explain the pumping lemma for context free language with example	5	BL02	CO01	PO2	

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6+1+2+4+
1+3+4

Enrollment No.....

Total No. of Questions: 3

Enrollment No. EN21CS304039

Faculty of Engineering

Mid Sem I Examination March - 2023

CS3CO38 Theory of Computation

Programme: B.Tech. Branch/Specialisation: CSE

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Which of the following is false (a) $\Sigma^*\cup\Sigma'=\Sigma^*$ (b) $\Sigma'\subseteq\Sigma^*$ (c) $\Sigma^*\cap\Sigma'-\Sigma^*$ (d) $\Sigma'.\Sigma'=\Sigma'-\Sigma'$	1	BL_{01}	CO_{02}	PO_{01}	
	ii.	Choose the correct statement from the following (a) Every non RL is infinite (b) Every non RL is finite (c) Every RL is infinite (d) Every RL is finite	1	BL_{01}	CO_{01}	PO_{01}	
	iii.	Which two of the following out of four regular expressions(RE) are equivalent (I) $(00)^*(\varepsilon+0)$ (II) $(00)^*$ (III) 0^* (IV) $0(00)^*$ (a) I & II (b) II & III (c) III & IV (d) I & III	1	BL_{01}	CO_{03}	PO_{01}	
	iv.	If we convert from NFA to DFA then number of states always: (a) Increase (b) Decrease (c) Dependance on Automata (d) None of these	1	BL_{01}	CO_{01}	PO_{02}	
	v.	Myhill-Nerode theorem is used for: (a) Providing regular or non-regular (b) Minimization of FA (d) Finding equivalent classes (d) All of these	1	BL_{02}	CO_{01}	PO_{01}	

	vi.	Which of the following statement is correct (I) NFA is more powerful than DFA (II) NFA and DFA are equivalent in power (III) NFA can accept more no of Languages compared to DFA (a) Only I is correct (b) Only II is correct (c) Only IIII is correct (d) Above all are correct	1	BL01	CO01	PO01
Q.2	i.	What is Finite Automata with tuples?	2	BL01	CO01	PO01
	ii.	Explain regular expression with example.	2	BL01	CO02	PO02
	iii.	Construct FSA for the following language over Σ={a,b} (a) L={(ab*)*} (b) L={b*a+b*}	3	BL03	CO03	PO03
	iv.	Explain different closure properties of regular language.	5	BL01	CO03	PO01
OR	v.	Write Difference between Mealy and Moore machine.	5	BL02	CO01	PO03
Q.3	i.	What is Arden's theorem?	2	BL01	CO01	PO01
	ii.	Explain (ε) - NDFA.	4	BL01	CO02	PO01
	iii.	What are the difference between DFA & NFA	6	BL01	CO04	PO02
OR	iv.	State pumping lemma for regular languages. Also proof that L= {a^n/n is a prime number} is not regular language.	6	BL03	CO03	PO03

******

5

1+2+2+1+5+6+2+2

Total No. of Questions: 3

Enrollment No.....

MEDI-CAPS UNIVERSITY
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Mid Sem I Examination March -2023

CS3CO36 Operating System

25+

Programme: B.Tech. Branch/Specialisation: CSE

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	For real time operating systems, interrupt latency should be a) Zero b) minimal c) maximum d) depends on scheduling	1	BL_{01}	CO_{01}	PO_{01}	PSO_{04}
	ii.	Which system call can be used by a parent process to determine the termination of child process a) wait b) exit c) fork d) get	1	BL_{01}	CO_{01}	PO_{02}	PSO_{02}
	iii.	The number of processes completed per unit time is known as a) Output b) Throughput c) Efficiency d) Capacity	1	BL_{01}	CO_{01}	PO_{02}	PSO_{01}
	iv.	The interval from the time of submission of a process to the time of completion is termed as a) waiting time b) turn around time c) response time d) throughput	1	BL_{02}	CO_{02}	PO_{03}	PSO_{02}
	v.	Which scheduling algorithm allocates the CPU to the process that request the CPU first a) FCFS b) SJF c) Round Robin d) Priority	1	BL_{02}	CO_{02}	PO_{01}	PSO_{03}
	vi.	With respect to operating system which of the following is not a valid process state	1	BL_{01}	CO_{02}	PO_{03}	PSO_{02}

K1 & R.

a) Ready
b) Waiting
c)Running
d) starving

Q.2 i. Write down the difference between multiprogramming and time-sharing operating system. **2** BL_{01} CO_{01} PO_{02} PSO_{03}

ii. Explain Real time operating system along with its types. **2** BL_{02} CO_{01} PO_{01} PSO_{02}

iii. Explain Process Control Block. **3** BL_{02} CO_{02} PO_{03} PSO_{04}

iv. Differentiate preemptive and non preemptive scheduling with example. **5** BL_{03} CO_{02} PO_{01} PSO_{02}

OR v. Explain the process states with diagram in detail. **5** BL_{02} CO_{01} PO_{02} PSO_{04}

Q.3 i. Explain process scheduling. **2** BL_{01} CO_{02} PO_{01} PSO_{02}

ii. Consider the set of 5 processes whose arrival time and burst time are given below- **4** BL_{02} CO_{01} PO_{03} PSO_{01}

Process Id	Arrival time	Burst time
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

Calculate the average waiting time and average turn around time using round robin CPU scheduling and consider time quantum = 2 unit.

60+1+2+3+4+1+4+5

iii. Explain Semaphore in detail. Also define its types. **6** BL_{02} CO_{02} PO_{03} PSO_{13}

OR iv. Explain Reader Writers Problem in detail along with its pseudocode. **6** BL_{03} CO_{01} PO_{02} PSO_{04}

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Total No. of Questions: 3

Enrollment No.....

Knowledge is Power

Faculty of Engineering

Mid Sem I Examination March - 2023

CS3CO35 Microprocessor & Interfacing

20+

Programme: B.Tech. Branch/Specialisation: CSE

Duration: 1.5 Hrs. **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	What is maximum address capacity of 8085 Microprocessor? a. 64KB b. 1 MB c. 4 KB d. 32KB	1	BL02	CO1	PO3, PO11	
	ii.	There are _____ general purpose registers in 8085 processor a. 5 b. 6 c. 7 d. 8	1	BL01	CO1	PO3, PO11	
	iii.	Which of the following interrupt is non-vectored in 8085? a. RST 7.5 b. RST 6.5 c. TRAP d. INTR	1	BL02	CO1	PO3, PO11	
	iv.	What is stored in the H & L general-purpose register? a. Opcode b. Address of memory c. Address of next instruction d. Temporary data	1	BL01	CO2	PO3, PO5, PO11	
	v.	Which of the following is a 2-byte instruction? a. LDA 2500H b.MOV A, B c. IN 01H d. JMP 2085H	1	BL02	CO2	PO3, PO5, PO11	

Subroutine: A SR takes 2 strings of equal lengths as its I/P parameter. Length of strings can be passed via R0 add. of 11 R1 & R2

Need: CO2 It serves to reduce no. of pins generates multiple outputs for data & signals

	vi.	Which addressing mode execute its instructions within CPU without the necessity of reference memory for operands? a. Implied Mode b. Immediate Mode c. Direct Mode d. Register Mode		BL02	CO2 PO3, PO5, PO11
Q.2	i.	What do you mean by interrupt?			CO1 PO3
	ii.	Explain features of DMA operation.	2		CO1 PO3, PO11
	iii.	What is demultiplexing of Address/ Data lines in 8085 Microprocessor, why it is needed.	3		CO1 PO3, PO11
	iv.	Draw and explain architecture of 8085 Microprocessor.	5		PO3, PO11
OR	v.	Explain these PINs of 8085 Microprocessor: READY, ALE, TRAP, HOLD, RESET, IN	5	BL	PO3, PO11
Q.3	i.	What is instruction set? explain.	2	BL02	3,
	ii.	What is subroutine? explain with example.	4	BL01	CO
	iii.	Explain addressing modes of 80 microprocessor with examples.	5	BL02	CO2
OR	iv.	Explain these instructions with example: ADD, LXI, MOV, PUSH, XCHG, INX			

Instruction set commands used by mp. to execute or perform an opⁿ on given data.

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Interrupt
method of creating temp - halt during prg. execution
It req. os to stop & figure out what to do next.

3+2+2+2+2+2+3+6

Total No. of Questions: 3

Enrollment No. EN21CS304039

Faculty of Engineering

Mid Sem I Examination March - 2023

CS3CO39 Database Management System

Programme: B.Tech. Branch/Specialisation: CSE

Duration: 1.5 Hrs. **Maximum Marks: 30**

			Marks	BL	CO	PO	PSO
Q.1	i.	Who created the first DBMS? a) Edgar Frank Codd b) Charles Bachman c) Charles Babbage d) Sharon B. Codd	1	BL1	CO1	PO1	
	ii.	Which type of data can be stored in the database? a) Image oriented data b) Text, files containing data c) Data in the form of audio or video d) All of the above	1	BL2	CO1	PO1	
	iii.	Which of the following is not a type of database? a) Hierarchical b) Network c) Distributed d) Decentralized	1	BL2	CO1	PO1	
	iv.	Which of the following is used to denote the selection operation in relational algebra? a) Pi (Greek) b) Sigma (Greek) c) Lambda (Greek) d) Omega (Greek)	1	BL1	CO2	PO1	

	v.	Which is a join condition contains an equality operator: a) Equijoins b) Cartesian c) Natural d) Left	1	BL1	CO2	PO3
	vi.	Which is a unary operation: a) Selection operation b) Primitive operation c) Projection operation d) Generalized selection	1	BL1	CO2	PO1
Q.2	i.	Write any four differences between the data and information.	2	BL4	CO1	PO2
	ii.	Explain the two tier and three tier architecture of DBMS in detail with a suitable diagram.	4	BL4	CO1	PO3
	iii.	Write any six differences between conventional file systems and database management systems.	6	BL5	CO1	PO2
OR	iv.	Explain entity relationship model in detail with suitable examples.	6	BL6	CO1	PO3
Q.3	i.	Define the relational algebra.Also write the types of operations of relational algebra.	2	BL4	CO2	PO2
	ii.	Explain the inner join and its types in detail with examples.	4	BL4	CO2	PO2
	iii.	Explain the SQL.Also explain the languages of SQL (DDL, DML, DCL) in detail with examples.	6	BL6	CO2	PO3
OR	iv.	Explain the basic operations of relational algebra with examples.	6	BL4	CO2	PO2

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3+2+2+
5+2+3
+5

al No. of Questions: 3

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Enrollment No. EN21CS304039

Faculty of Engineering

Mid Sem I Examination March - 2023

CS3EL11 Statistical Analysis

gramme: B.Tech. Branch/Specialisation: CSE

ration: 1.5 Hrs. **Maximum Marks: 30**

e: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 CQs) should be written in full instead of only a, b, c or d. Assume suitable data if essary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
1	i.	Relation between Mean, Median and Mode for symmetric distribution is given by a) Mean = Median = Mode b) Mean = Median + Mode c) Mean > Median > Mode d) None of these.	1	BL_1	CO_{01}	PO_{01}	PSO_{03}
	ii.	Relationship among the Arithmetic Mean (AM), Geometric Mean (GM) and Harmonic Mean (HM) can be represented by the formula a) AM × HM = GM b) AM^2 = HM × GM c) AM × HM = GM^2 d) None of these.	1	BL_1	CO_{01}	PO_{01}	PSO_{03}
	iii.	The algebraic sum of the deviations of all the variates from their arithmetic mean is equal to the a) zero b) arithmetic mean c) sum of the variates d) None of these.	1	BL_1	CO_{01}	PO_{01}	PSO_{03}

iv. A variate which can take infinite number of values in a given interval $a \le x \le b$ is called - **1** BL1 CO01 PO01 PSO01

a) Discrete random variate
b) Continuous random variate
c) General random variate
d) None of these.

v. Let x be a continuous random variable with probability density unction $f(x)$, then mathematical expectation $E(x)$ of x with certain restrictions is given by **1** BL1 CO01 PO01 PSO01

a) $E(x) = \int x f(x) dx$

b) $E(x) = \int f(x) dx$

c) $E(x) = \int x dx$

d) None of these.

vi. The conditional probability for the event E_1 when the event E_2 has already happened denoted by- **1** BL1 CO01 PO01 PSO01

a) $P(E_2/E_1)$ b) $P(E_1 * E_2)$
c) $P(E_1/E_2)$ d) None of these.

Q.2 i. Write the formula to calculate the mode for a frequency distribution of continuous series. **2** BL2 CO01 PO01 PSO01

ii. From the following table giving the heights of students calculate the quartile range, semi quartile range and coefficient of quartile deviation: **4** BL2 CO01 PO01 PSO01

Height (c.m.)	Number of students
158	21
159	25
160	28
161	18
162	20
163	22
164	24
165	23
166	18
Total	199

iii. Find the missing frequencies of the following distribution whose median is 46. **6** BL3 CO02 PO01 PSO01

Variable	Frequency
10-20	12
20-30	30
30-40	?
40-50	65
50-60	?
60-70	25
70-80	18
Total	229

OR iv. The following table gives goal scored by two teams A and B in a football season. Find the team which is more consistent in its performance **6** BL3 CO02 PO01 PSO01

Number of goals scored	Number of football matches played	
	Team A	Team B
0	27	17
1	9	9
2	8	6
3	5	5
4	4	3

Q.3	i.	A drawer contains 50 bolts and 150 nuts. Half of the bolts and half of the nuts are rusted. If one item is chosen at random, what is the probability that it is rusted or is a bolt?	**2**	BL_2	CO_{01}	PO_{01}	PSO_{03}
	ii.	Define probability density function (p.d.f.). Is the function $f(x)=\begin{cases}3(3-x) & 0<x<3\\ 0 & otherwise\end{cases}$ p.d.f. or not?	**4**	BL_2	CO_{01}	PO_{01}	PSO_{03}
	iii.	Define cumulative distribution function. If $f(x)=\frac{c}{1+x^2}, -\infty<x<\infty$, then find c and obtain corresponding distribution function.	**6**	BL_3	CO_{03}	PO_{02}	PSO_{03}
OR	iv.	Define expectation for Discrete random variable. Calculate the expected value of the number of points that will be obtained in a single throw with an ordinary die. Find variance also.	**6**	BL_3	CO_{03}	PO_{02}	PSO_{03}

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