Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: B.Tech.

Mid Semester Examination - Spring 2023

Branch	**: CSE**	**Semester**	**: VI**
Title of the Course	**: Microprocessors and Interfacing**	**Course Code**	**: ECB355**

Time: 1 Hour 30 Minutes **Maximum Marks: 25**

Note: *All questions are compulsory.*

COURSE OUTCOMES		COGNITIVE LEVELS
CO1	Ability to analyze and develop the basic architecture of microprocessors 8085 and 8086 and microcontroller.	**Understanding** (Level II)
CO2	Ability to interface peripherals with Microprocessors and Microcontrollers	**Analyzing** (Level IV)
CO3	Ability to analyze and develop the assembly language program for microprocessor 8085 and microcontroller 8051	**Evaluating** (Level V)
CO4	Ability to design and create microprocessor/microcontroller based system	**Analyzing** (Level IV)

Course Outcomes(CO's)	CO1	CO2	CO3	CO4
Questions No.	Q2,Q3,Q4,Q5,Q7,Q9	Q8	Q1,Q6	Q10

Answer the following questions.

Q1.	Write an 8085 program to swap the two nibbles of the accumulator.	**[2]**
Q2.	Differentiate between a clock cycle, a machine cycle and an instruction cycle in 8085. List down the machine cycles involved in the execution of the SHLD 16-bit address instruction of 8085.	**[2]**
Q3.	What is meant by memory segment and How the Physical address is calculated in 8086 microprocessor?	**[2]**
Q4	Discuss the interrupts of 8085.	**[2]**
Q5.	Explain the Flag bits in 8086 microprocessor.	**[2]**
Q6.	Write an 8085 ALP to perform 8-bit BCD addition.	**[2]**
Q7.	Draw the timing diagram for the 8085 instruction ADD B, assume other details.	**[2]**
Q8	With a neat diagram discuss the various mode of operation of 8255 and show two 8255s can be connected in an 8086-based system to form a 16-bit port.	**[4]**
Q9.	Discuss the maximum mode configuration of 8086 with a neat diagram, clearly pointing out the functions of the various signals.	**[4]**
Q10.	Show how a 16K RAM starting from 8000H, a 2K ROM starting from 0000H, an input port at 45H and an output port at 54H can be connected in an 8085 based computer system. Discuss the decoding logic and the signals involved.	**[3]**

Roll No.:.....

National Institute of Technology, Delhi

Mid Semester Examination (Spring, 2023)

Branch:	**CSE**	**Semester:**	**6**
Title of the Course:	**Cloud computing**	**Course Code:**	~~CSBB 406~~ CSL 376
Time:	**1.5 Hours**	**Maximum Marks:**	**25**

- **Note: All questions are compulsory.**

Q1. Justify the statement - "Cloud computing is a concept that involves pooling physical resources and offering them as virtual resources". Also, discuss the concept of multi-tenancy and on-demand functionality. **[4]** **[CO 1]**

Q2. If Google App Engine is a SaaS or PaaS? Explain in detail. **[5]** **[CO 4]**

Q3. Illustrate cloud migration deployment considerations and explain one of the cloud migration approach. **[6]** **[CO 1]**

Q4. I. Discuss the architecture of web based applications. State various web applications. **[3]** **[CO 4]**

II. Contrast web based applications with cloud computing. **[2]**

Q5. Tim's organization is planning the future of their data center infrastructure and has decided that they would like to move to a cloud service model. They have already embraced virtualization but would like to gain the management benefits of a cloud offering. They are working with a service provider who will provision hardware for their exclusive use. That equipment will reside in a data center that serves many customers. **[5]** **[CO 4]**

Illustrate the type of cloud deployment model that Tim's organization is planning.

National Institute of Technology, Delhi

Name of the Examination: B.Tech

Mid Semester Examination (Spring Semester 2023)

Branch: CSE **Semester: 6th**

Title of the Course: Compiler Design **Course Code: CSB 353**

Time: 1.5 Hours **Maximum Marks: 25**

Q1. **(a)** Give your views on which type of compiler is better: one running slowly but producing optimized code and another one running very fast but producing unoptimized code? **(2)**

(b) A lexical analyzer uses the following patterns to recognize three tokens T1, T2, and T3 over the alphabet {a,b,c}. **(2)**

T1: a? (b|c) *a
T2: b? (a|c) *b
T3: c? (b|a) * c

Note that 'x?' means 0 or 1 occurrence of the symbol x. Note also that the analyzer outputs the token that matches the longest possible prefix. If the string bbaacabc is processed by the analyzer, find the sequence of tokens it outputs that will show the complete solution.

Q2. The following is a grammar for regular expressions over symbols a and b only, using + in place of | for union, to avoid conflict with the use of vertical bar as a metasymbol in grammars: **(5)**

rexpr → rexpr + rterm | rterm
rterm → rterm rfactor | rfactor
rfactor → rfactor * | rprimary
rprimary → a | b

Check whether the above grammar is suitable for top-down parsing? If not, transform it.

Q3. Consider the following grammar: **(7)**

S → aAbB | bAaB | ε
A → S
B → S

(a) Compute first and follow of the above Grammar. **(b)** Also, construct LL (1) parsing table for the same.

Q4. **(a)** Give a comparison between LR (0) and LALR (1) parsers.

(b) Show that the following grammar **(9)**

S→ Xa | bXc | Yc | bYa

X→d

Y→d

is LR(1) but not LALR(1)

Roll No.:.....

National Institute of Technology Delhi

Name of the Examination: Mid Sem Examination (March, 2023)

Branch: CSE (B.Tech., VI sem.)
Title of the Course: Data Mining

Time: 1.5 Hours
Note: 1. Attempt all questions. **2.** Read all questions carefully **3.** Missing parameters or values may be assumed.

Semester: VI
Course Code: CSB 352
Maximum Marks: 25

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1. (a) Explain the algorithm for Matrix multiplication using MapReduce. (4)

   (b) Explain the following: (4)

   i. How to pick the right value of k in k-means clustering algorithm.

   ii. BFR vs CURE Clustering algorithm.

2. (a) Using the data from Fig. 1, add to the signatures of the columns the values of the following hash functions (using algorithm for computing the signature matrix): (2)

Row	S_1	S_2	S_3	S_4
0	1	0	0	1
1	0	0	1	0
2	0	1	0	1
3	1	0	1	1
4	0	0	1	0

Figure 1:

   i. $h_3(x) = 2x + 4 mod 5$.

   ii. $h_4(x) = 3x - 1 mod 5$

   (b) Evaluate the S-curve $1 - (1 - s^r)^b$ for $s = 0.1, 0.2, ..., 0.9$, for the following values of r and b: (4)

   i. r =3 and b=10.

   ii. r =6 and b=20.

   iii. r =5 and b=50.

   For each of the (r, b) pairs, compute the threshold that is, the value of s for which the value of $1 - (1 - s^r)^b$ is exactly $1/2$. How does this value comparewith the estimate of $(1/b)^{(1/r)}$.

3. (a) Find the L_1 and L_2 distances between the points $(5, 6, 7)$ and $(8, 2, 4)$. (2)

   (b) Find the Jaccard distances between the following pairs of sets: $\{1, 2, 3, 4\}$ and $\{2, 3, 4, 5\}$. (1)

   (c) Compute the cosines of the angles between each of the following pairs of vectors: $(5, 0, -4)$ and $(-1, -6, 2)$. (1)

4. (a) Perform a hierarchical clustering of the one-dimensional set of points 1, 4, 9, 16, 25, 36, 49, 64, 81, assuming clusters are represented by their centroid (average), and at each step the clusters with the closest centroids are merged. (3)

   (b) For the three clusters of Fig. 2, (4)

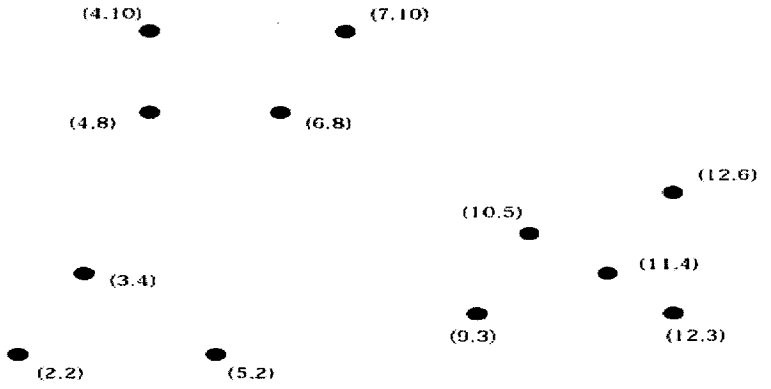

Figure 2:

   i. Compute the representation of the cluster as in the BFR Algorithm. That is, compute N, SUM, and $SUMSQ$.

   ii. Compute the variance and standard deviation of each cluster in each of the two dimensions.

Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: Mid Semester Theory

Branch:	**Computer Science Engineering**	**Semester:**	**6th (3rd year)**
Title of the Course:	**Network Programming**	**Course Code:**	**CSB 351**
Time:	**1.5 Hours**	**Maximum Marks:**	**25**

Question number mapping with course outcomes (COs)

Q. No.	1	2	3	4	5
CO	1	1	2	2	2

Q1. Each part carries 1 mark **[4]**

(a) Differentiate Blocking I/O - one process per request and one thread per request
(b) Differentiate Datagram socket n stream socket
(c) Differentiate between Signal Driven and Asynchronous I/O
(d) connect API () in non-blocking and connect API() in blocking mode

Q2. Explain the following: (each part carries 2 marks) **[6]**

(a) I/O multiplexing
(b) I/O multiplexing select ()
(c) I/O monitoring calls

Q3. (a) There are times when we want to see how much data is queued to be read on a socket, without reading the data. What the techniques available for that? **[3]**

(b) Differentiate between getsockopt() and setsockopt(). Explain with help of syntax and example. **[2]**

Q4. (a) What are the three ways to place a timeout on an I/O operation involving a socket? **[3]**

(b) Differentiate between close() and Shutdown(). Explain with the help of syntax and example. **[2]**

Q5. Discuss the syntax and features of the following:

(a) fcntl() **[2]**
(b) ioctl() **[3]**