

Jalpaiguri Govt. Engg. College  
(A Govt. Autonomous College)  
COE/B.Tech/CSE/PCC-CS602/2022-23  
2023  
COMPUTER NETWORK

FM: 70

Time Allotted: 3 hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

**Group – A**

**[Objective Type Questions]**

Answer all the questions

5 X 2 = 10

- 1 In which two layers of OSI model flow control is performed and why? ? - transport layer & DL
- 2 Assume that communication links are error free. Is data link layer still needed? Why?
- 3 For n devices in a network, what is the number of cable links required for a mesh, ring, bus and star topology?
- 4 What is firewall? 4
- 5 A 4-Mbps token ring has a token-holding timer value of 10msec. What is the frame that can be sent on this ring?

**Group – B**

**[Long Answer Type Questions]**

Answer any four of the following

4 X 15 = 60

- 6 a. Briefly describe the different layers of OSI model.
- b. Describe the components of a data communication system.
- c. Write down the sender algorithm for Go-back-N sliding window protocol.

6+3+6

- a. "In Selective-Repeat ARQ, sender window size cannot be greater than  $2^{m-1}$ ". Justify it with a suitable pictorial example.
- b. Consider the distance between devices is 4000km and the speed of propagation over the channel is 200,000km/sec. The channel has a bit rate of 4Kbps. For what range of frame size does stop-&-wait protocol give an efficiency of at least 60 percent?
- c. Explain why the vulnerable time in ALOHA depends on  $T_{fr}$ , but in CSMA depends on  $T_p$ ?

5+5+5

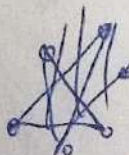
- 8 a. Draw 802.3 MAC frame format. What is the minimum length of the data received from upper layer in 802.3 MAC frame and why? What measure would be taken if the data is less than the minimum length?
- b. A network with one primary and four secondary stations uses polling. The size of a data frame is 1000 bytes. The size of the poll, ACK and NAK frames are 32 bytes each. Each station has 5 frames to send. How many total bytes are exchanged if there is no limitation on the number of frames a station can send in response to a poll?
- c. Explain why collision is an issue in random access protocols but not in controlled access protocols.

(1+3+1)+6+4

- 9 a. In bit-oriented protocol what is bit stuffing? Why is it used?
- b. Draw the flow chart for CSMA/CD media access control.
- c. Draw and explain HDLC frame format.



6  
5



P.T.O

12288



$$(2+2)+5+6$$

10. a. Draw the frame format of IPv4 datagram. ✓
- b. In an IPv4 datagram, the value of HLEN is 5, the value of total length is 200, and the offset value is 200. What is the number of the first byte and number of the last byte in this datagram? Is this the last fragment, the first fragment, or a middle fragment? ✓
- c. An ISP is granted a block of address starting with 150.8.0.0/16. The ISP needs to distribute these addresses to three group of customers.
- i) The first group has 200 customers, each need 16 addresses.
  - ii) The second group has 400 customers, each need 8 addresses.
  - iii) The third group has 2000 customers, each need 4 addresses.
- Handwritten calculations on the right side of the page:
- $$\begin{aligned} & \checkmark 32000 \\ & \checkmark 3200 \\ & \checkmark 8000 \end{aligned}$$

Design the sub-blocks and give the slash notation for each sub-block. Find out how many addresses are still available after these allocations.

$3+5+7$

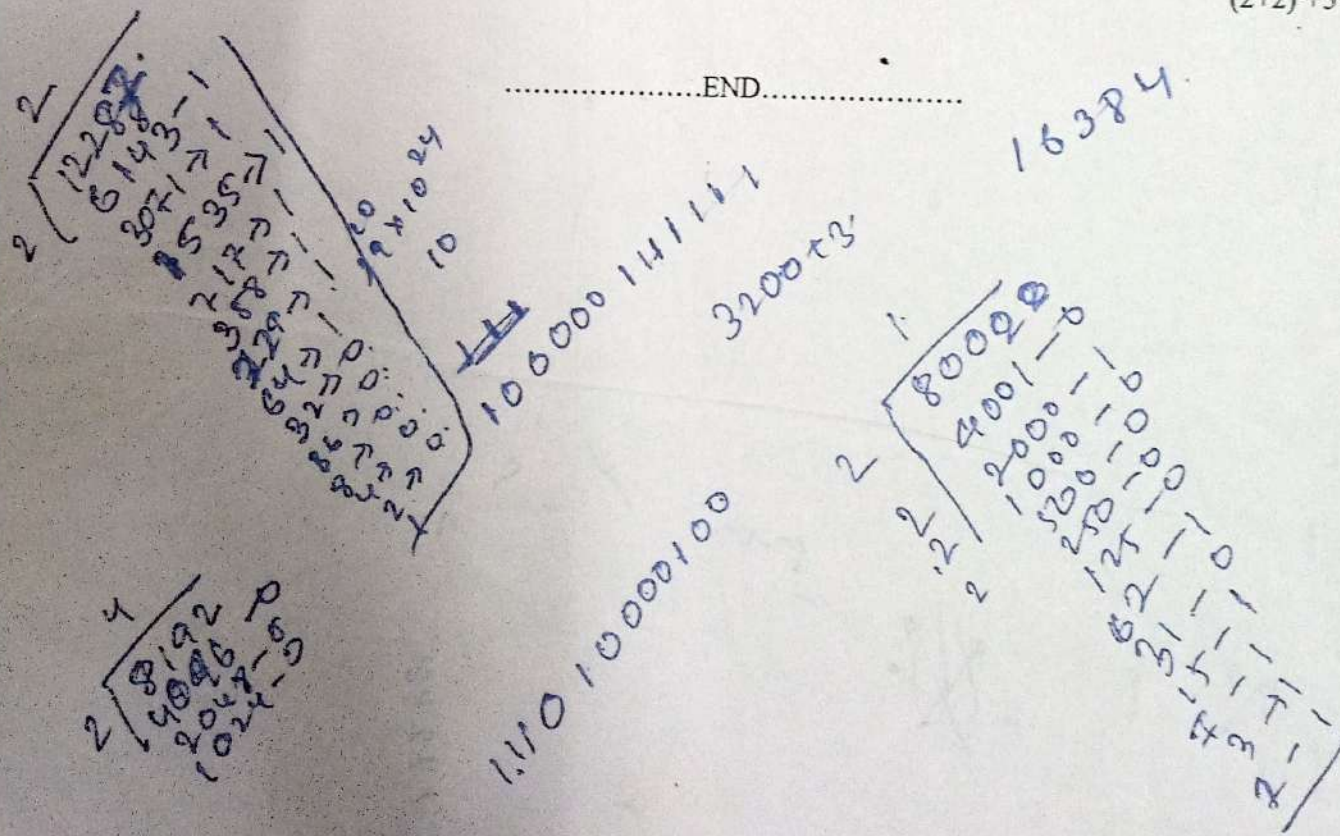
- What is routing? Define static and dynamic routing.
- Draw the header format of IP datagram. What is the minimum and maximum size of IP datagram?
- "Distance Vector Routing propagates good news rapidly, but bad news very slowly"- Justify.

$$(2+4) \div 4 + 5$$

12. a. What is the minimum and maximum size of a UDP header? In TCP, if the value of HLEN is 0111, how many bytes of OPTIONS are included in the segment?  
b. Draw and explain the common fields of a routing table.  
c. A client uses TCP to send data to a server. The data rate are 16 bytes. Calculate the efficiency of this transmission at the TCP level (ratio of useful bytes to total bytes), assuming no options in the TCP segment. Calculate the efficiency of transmission at the IP level. Assume no options for the IP header. Calculate the efficiency of transmission at the data link layer. Assume no options for the IP header and use Ethernet at the data link layer.

$$(2+2) + 5 + 6$$

.....END.....





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2024  
COMPUTER NETWORK

FM: 70

Time Allotted: 3 hours

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Candidates are required to give their answers in their own words as far as practicable.

**Group - A**  
**[Objective Type Questions]**

Answer all questions

5 X 2 = 10

1. What is piggybacking?
2. Calculate the HLEN (in IPv4) value if the total length is 1200 bytes, out of which 1176 bytes is data from upper layer.
3. Which topology is most reliable and why?
4. Name the components of a data communication system.
5. What is the minimum size of Ethernet frame to detect collision?

**Group - B**  
**[Long Answer Type Questions]**

Answer any four of the following

4 X 15 = 60

6. a. Describe the components of a data communication system.  
b. Briefly describe the different layers of OSI model.  
c. In which two layers of OSI model Flow control and Error control is done? Why is it done in two layers?
7. a. What is vulnerable time? State and prove the efficiency of pure ALOHA.  
b. What is the advantage of BOOTP over RARP?  
c. A network with one primary and four secondary stations uses polling. The size of a data frame is 100 bytes. The size of poll, ACK and NAK frames are 32 bytes each. Each station has 5 frames to send. How many total bytes are exchanged if there are no limitations on the number of frames a station can send in response to a poll?
8. a. Why is acknowledgement numbered in stop & wait protocol? Discuss the situation when unnumbered acknowledgements can create confusion in the sender and receiver end.  
b. Discuss CSMA/CD with the help of a flow chart.  
c. Why is the size of the send window in Selective-Repeat-ARQ is  $2^m - 1$  instead of  $2^m$ ? Where  $m$  is the number of bits in sequence number. Explain with a diagram.
9. a. Briefly describe the header format of Ipv4.  
b. "Good news propagates rapidly, but bad news propagates very slowly in Distance vector routing". Explain with an example.  
c. An ISP is granted a block of addresses starting with 120.60.4.0/22. The ISP wants to distribute these blocks to 100 organizations with each organization receiving just eight addresses. Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.

P.T.O



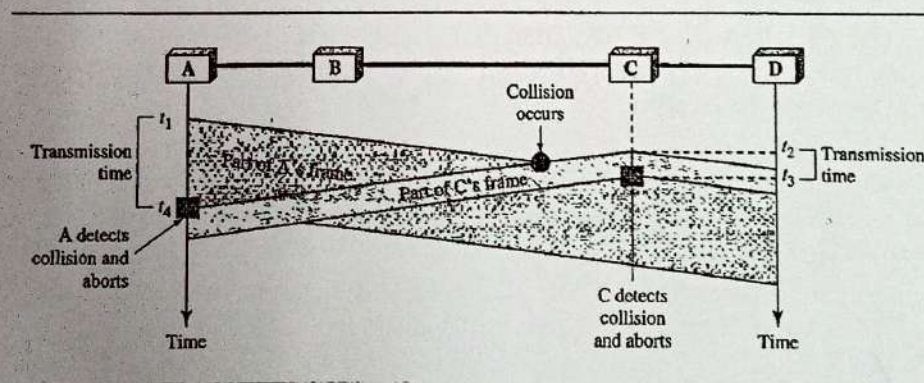
10. a. Draw and explain ARP packet format.  
 b. What is SYN Flooding attack? How it can be overcome?  
 c. In an IPv4 datagram, the M bit is 0, the value of HLEN is 5, the value of total length is 200, and the offset value is 200. What is the number of first byte and number of the last byte in this datagram? Is this the last fragment, the first fragment. Or a middle fragment?

6 + 4 + 5

11. a. Draw and explain HDLC frame format  
 b. "Length" field of UDP datagram is 16-bit long. What can be the maximum size of UDP datagram and why?  
 c. A client uses TCP to send data to a server. The data are 16 bytes.  
 a) Calculate the efficiency of this transmission at the TCP level (ratio of useful bytes to total bytes).  
 b) Calculate the efficiency of transmission at the IP level. Assume no options for the IP header.  
 c) Calculate the efficiency of transmission at the data link layer. Assume no options for IP header and use Ethernet at the datalink layer.

6 + 3 + 6

12. a. Explain why the vulnerable time in ALOHA depends on  $T_{fr}$ , but in CSMA depends on  $T_p$ ?  
 b. If the bandwidth of the line is 1.5 Mbps, RTT is 45 msec and packet size is 1 KB, then find the link utilization in stop and wait.  
 c. In the below figure, the data rate is 10Mbps, the distance between station A and C is 2500m, and the propagation speed is  $2 \times 10^8$  m/s. Station A starts sending a long frame at time  $t_1 = 0$ , station C starts sending a long frame at time  $t_2 = 3\mu s$ . The size of the frame is long enough to guarantee collision detection. Find the number of bits station A and station C has sent before detecting collision.



4 + 4 + 7

.....END.....



21101104052  
MD. SHAHIL

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE  
[A GOVERNMENT AUTONOMOUS COLLEGE]  
COE/B.TECH./CSE /PCC-CS601/2023-24

2024

COMPILER DESIGN

Full Marks: 70

Times: 3 Hours

The figures in the margin indicate full marks.  
Candidates are requested to write their answers in their own words as far as practicable.

GROUP-A  
[OBJECTIVE TYPE QUESTIONS]

Answer all questions

5x2=10

1. Define parse tree with example?
2. What is regular definition?
3. What is meant by left recursion in a grammar? How it removed?
4. Write the regular expression for the Identifier.
5. What are the four possible action of a shift reduce parser?

GROUP-B  
[LONG ANSWER TYPE QUESTIONS]

Answer any four questions

4x15=60

6. a) How does Lexical Analyzer help in the process of compilation? Explain it with example.  
b) What is context free grammar? Give example.  
c) Consider the operator precedence relationship table which is given below. Draw the precedence graph & calculate the preceding function.

7

3

5

	id	+	*	\$
id		>	>	>
+	<	>	<	>
*	<	>	>	>
\$	<	<	<	

7. Consider the following grammar :

$E \rightarrow TE'$   $E' \rightarrow +E/\epsilon$   $T \rightarrow FT'$   $T' \rightarrow T/\epsilon$   $F \rightarrow PF'$   $F' \rightarrow *F/\epsilon$   $P \rightarrow (E)/a/b/\epsilon$

2+4

8

1

- a) Obtain the FIRST and FOLLOW sets of the above grammar.
  - b) Construct a Predictive parsing table for the above grammar
  - c) Check whether the grammar is LL(1) or not?
8. i) Define DAG? What are the applications of DAG's? Construct the DAG of the following expression.  $Y = t + t * (k - p) + (k - p) * d$ .
  - ii) What are the differences among Quadruples, Triples and Indirect Triples?
  - iii) What are the rules finding the leader statements in the code? Find the basic blocks and draw the flow graph for the following code :

3

5

3+3

1

1. sum = 0
2. i = 1
3. if i > n goto 15
4. t1 = addr(a) - 4
5. t2 = i \* 4
6. t3 = t1[t2]
7. t4 = addr(a) - 4
8. t5 = i \* 4
9. t6 = t5[t5]
10. t7 = t3 \* t6
11. t8 = sum + t7



12. sum = t8
13. i = i + 1
14. goto 3
- 15.

9. Consider the following grammar :

$E \rightarrow E + T$   
 $E \rightarrow T$   
 $T \rightarrow T * F$   
 $T \rightarrow F$   
 $F \rightarrow (E)$   
 $F \rightarrow id$

*main*

- a) Obtain the FIRST and FOLLOW sets of the above grammar. 1+3
  - b) Construct a SLR parsing table for the above grammar 7
  - c) Explain the SLR parser's action by describing the moves it would make on an input  $id * id + id \$$  4
10. a) Define Syntax-Directed definition, Synthesized attributes and Inherited attribute with suitable examples. 6
- b) What is an activation record? When and why are those records used? List different fields of an activation records and state the purpose of these fields. 2+2+3
- c) Generate the three address code for the following program fragment 2
- ```

while (A<C and B>D) do
    if A=1 then C=C+1
    else while A<=D do
        A=A+3
    
```
11. Write short notes on any three of the following : 3 X 5
- a. Peephole optimization ✓
  - b. Back patching
  - c. Cross compiler
  - d. Dead code elimination ✓
  - e. Input buffering
  - f. Explicit and implicit type conversion

*Call  
A then*

*A=1  
C=C+1*

*Stack*

*Input Buffering*



Jalpaiguri Govt. Engg. College  
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2024

SOFT SKILL AND INTERPERSONAL COMMUNICATION

FM: 70

Time Allotted: 3 hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group – A

[Objective Type Questions]

Answer all the questions

5 X 2 = 10

1. What is 'WISH' and 'GOAL'?
2. What is Motivation?
3. What is Gestures?
4. What is positivity?
5. What is team communication?

Group – B

[Long Answer Type Questions]

Answer any four of the following

4 X 15 = 60

6. a. What is Soft skill development? Briefly describe.  
b. What are the different points someone should address to have sufficient levels of self-discovery.  
5+10
7. a. What are the different key aspects of 'Goal Setting'?  
b. Define "Smarter Goal".  
c. Briefly discuss Maslow's motivation theory.  
5+5+5
8. a. Define Beliefs, Values, Attitude, and Virtue?  
b. Describe the key elements of Interpersonal Communication.  
8+7
9. a. What are the different components of Communication?  
b. Describe Verbal Communication in details.  
c. Write the things that an Interviewee should do during a Job Interview.  
5+7+3
10. a. What is "Communication Model"? Describe Shannon-Weaver Model with pictorial representation.  
b. Briefly discuss the different types of Barriers in Communication.  
c. Write the importance of Body Language in non-verbal communication.  
(2+5)+5+3
11. a. What is "Public Speaking"? Mention some essential tips for effective public speaking.  
b. Find out the similarities as well as differences between hard and soft skills.  
(2+8)+5
12. a. What is "Group discussion"? Write the importance of group discussion.  
b. What is "Presentation Skill"? Discuss presentation skill in terms of Types of Presentations, Content Creation and Audience Analysis.  
(1+5) +(2+7)

END



**Jalpaiguri Govt. Engg. College**  
**(A Govt. Autonomous College)**  
 COE/B.Tech/CSE/PEC-CS602C/2023-24  
 2024  
 IMAGE PROCESSING

*Handwritten note:*  
 2/2/24 2:00 PM

FM: 70

Time Allotted: 3 hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

**Group – A**  
**[Objective Type Questions]**

Answer all questions

5 X 2 = 10

1. Find the number of bits required to store 128X256 image with 32 gray levels.
2. What are Image Negatives?
3. What do you mean by Zooming of digital images?
4. What is Image Transform?
5. What is quantization?

**Group – B**  
**[Long Answer Type Questions]**

Answer any four of the following

4 X 15 = 60

- a. What is nearest neighbor interpolation? Explain. What is the disadvantage of this interpolation?
- b. Give the formula for calculating D4 and D8 distance. Let  $V=\{0,1\}$  and compute the lengths of the shortest 4- and 8- paths between p and q. If a particular path does not exist between these two points, explain why?

|     |   |   |   |       |
|-----|---|---|---|-------|
|     | 3 | 1 | 2 | 1 (q) |
|     | 2 | 2 | 0 | 2     |
|     | 1 | 2 | 1 | 1     |
| (p) | 1 | 0 | 1 | 2     |

*Handwritten note:*  
 $D_4 = 1 + 1 + 1 = 3$

- c. For the images  $f_1$  and  $f_2$  (given below), with constants  $a_1=1$  and  $a_2=-1$ , prove that max operator is a nonlinear operator.

$$f_1 = \begin{bmatrix} 0 & 2 \\ 2 & 3 \end{bmatrix} \text{ and } f_2 = \begin{bmatrix} 6 & 5 \\ 4 & 7 \end{bmatrix}$$

$$(4+1) + (2+3) + 5$$

7. a. Consider an image point [2,2]. Perform a scaling operation in both x-axis and y-axis by 3 units.
- b. What are isotropic filters? Derive the Laplacian filter for a 2D image function  $f(x,y)$ . Is this an isotropic filter? If yes, then why?
- c. What is correlation and convolution?

$$5 + (1+5+2) + 2$$

8. a. A binary image contains straight lines oriented horizontally, vertically, at  $45^\circ$ , and at  $-45^\circ$ . You wish to detect places where there are 1-pixel-long breaks in these lines. Assume that the gray level of the lines is 1, and the gray level of the background is 0. Give a set of 3X3 masks that can be used to detect 1-pixel long breaks in these lines.

- b. Compute the 1<sup>st</sup> and 2<sup>nd</sup> derivative of a digital image strip given below:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 6 | 6 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 3 | 4 | 5 | 6 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Now discuss the differences in the properties of computed 1<sup>st</sup> and 2<sup>nd</sup> derivatives as we traverse the profile from left to right.

P.T.O

*Handwritten calculations:*  
 $2 \times 2 \times 2 \times 2$   
 $\times 2 \times 2 \times 2$   
 $\times 2$   
 $288$   
 $128$   
 $288$   
 $12$

6+9



9. a. What is ramp edge and step edge?  
 b. When and how double line effect is produced using second order derivative filter in case of line detection?  
 c. Using the given image containing a straight edge segment, proof that the direction of an edge at any arbitrary point  $(x, y)$  is orthogonal to the direction of the gradient vector at the point.

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |

2+5+8

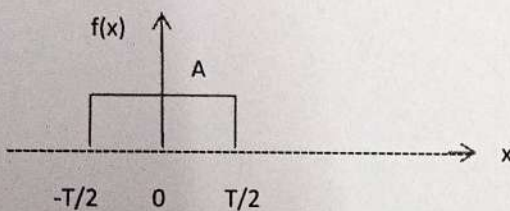
10. a. Explain LoG and its application in image processing.  
 b. What is unsharp masking and high-boost filtering?  
 c. What is image smoothing and image sharpening? Give examples.

7+3+5

11. a. What is contrast stretching?  
 b. Explain log transformation and power law transformation and its application on image.  
 c. Discuss histogram equalization for an image.

3+7+5

12. a.



Compute The Fourier Transform of the above rectangular pulse and draw the corresponding Fourier spectrum.

- b. Prove that  $\mathcal{F}[f(x,y)(-1)^{x+y}] = F(u-M/2, v-N/2)$ , where  $\mathcal{F}[p]$  denotes the Discrete Fourier transform of the argument  $p$ .  
 c. Explain Euler's Theorem as a circular motion in a complex plane and write the expression for  $\sin \theta$  and  $\cos \theta$  in terms of complex exponentials.

6+5+4

.....END.....



**JALPAIGURI GOVERNMENT ENGINEERING COLLEGE**  
**[A GOVERNMENT AUTONOMOUS COLLEGE]**  
**COE/B.TECH./CSE/PEC-CS601A/2023-24**

**2024**

**DATA WAREHOUSING & DATA MINING**

Full Marks: 70

Times: 3 Hours

*The figures in the margin indicate full marks.*  
*Candidates are requested to write their answers in their own words as far as practicable.*

**GROUP-A**  
**[OBJECTIVE TYPE QUESTIONS]**

Answer all questions

5x2=10

1. Define Apriori property and pruning step in data mining.
2. "FP-Tree approach is faster than Apriori algorithm for large frequent item-sets detection"- Justify.
3. Define support count and confidence in context of data mining algorithm.
4. What is concept hierarchy? Give an example for location dimension.
5. Construct a lattice of cuboids for a four dimensional data warehouse?

**GROUP-B**  
**[LONG ANSWER TYPE QUESTIONS]**

Answer any **four** questions

4x15=60

6.
  - i) Provide the pseudo code of the object reassignment step of the PAM algorithm. 4
  - ii) Illustrate the strength and weakness of k-means in comparison with k-medoids. 2
  - ✓ iii) Cluster the following items into three (03) clusters using k-means algorithm and Euclidean distance. 5  
Items: P1(2, 5); P2(2,9); P3(8,6); P4(9,3); P5(5,8); P6(7,5); P7(6,4); P8(1,6); P9(4,7); P10(6,8).  
Suppose that the initial seeds (centroid of each cluster) are P2, P4 and P7.  
Run the k-means algorithm for two iterations and at the end of each iteration, show:  
a) The new clusters (i.e. items belonging to each cluster)  
b) Centre of the new cluster.
- iv) Compute new medoids for a given data set {3,4,5,10,11,12} using PAM algorithm. (Assume initial medoid 4 for first cluster {3,4,5} and 10 for second cluster {10,11,12}) 4
7.
  - i) State the impact of apriori property in apriori algorithm for reducing execution time. 2
  - ii) Enumerate all frequent itemsets from the given database using Apriori algorithm with minimum support count S=3. List all the candidate set and large frequent itemsets for each database scan. 6
  - iii) Draw the FP-Tree for the same database with minimum support count S=3. 5
  - iv) Given frequent itemset l and subset s of l, prove that the confidence of the rule "s'  $\Rightarrow$  (l - s)" cannot be more than the confidence of "s  $\Rightarrow$  (l - s)," where s' is a subset of s. 2
8. Compare the following 6
  - i) Star schema, snowflake schema and fact constellation 3
  - ii) Independent and dependent data marts 6
  - ✓ iii) OLAP and OLTP

| TID | Item Codes       |   |
|-----|------------------|---|
| T1  | M, O, N, K, E, Y | 2 |
| T2  | D, O, N, K, E, Y | 6 |
| T3  | M, A, K, E       |   |
| T4  | M, U, C, K, Y    |   |
| T5  | C, O, O, K, I, E | 5 |



9. i) What are the differences between clustering and classification algorithms?  
 ii) Draw the decision tree of the training data given in Table using information gain. (*cheat* is the class label attribute).  
 iii) List the classification rules obtained from the decision tree.

| TID | Refund | Marital Status | Taxable Income | Cheat |
|-----|--------|----------------|----------------|-------|
| 1   | Yes    | Single         | 10 to 15       | No    |
| 2   | No     | Married        | 10 to 15       | No    |
| 3   | No     | Single         | up to 8        | No    |
| 4   | Yes    | Married        | 10 to 15       | No    |
| 5   | No     | Divorced       | 8 to 10        | Yes   |
| 6   | No     | Married        | up to 8        | No    |
| 7   | Yes    | Divorced       | 10 to 15       | No    |
| 8   | No     | Single         | 8 to 10        | Yes   |
| 9   | No     | Married        | up to 8        | No    |
| 10  | No     | Single         | 10 to 15       | Yes   |

10. i) What is the goal of optimization of view materialization problem?  
 ii) Define base and apex cuboids with example.  
 iii) Consider the following lattice of views (Fig. 1) along with a representation of the number of rows in each view where A is the base cuboids. Consider that view A is already materialized. Find another three views for materialization from B-J views which provide maximum benefit.  
 iv) Compute the overall benefit achieved after materialization of the views.

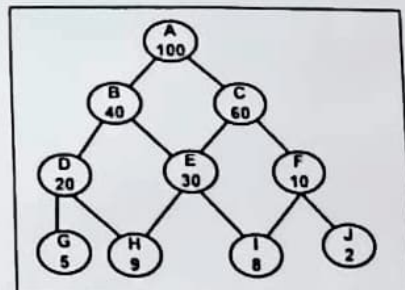


Fig. 1

11. i) Draw the 3-Tier architecture of data warehousing and explain.  
 ii) Discuss the OLAP operations which are performed in the middle tier of the data warehouse architecture on Multidimensional Data Model.  
 iii) Define bitmap and join indexing with example.
12. Suppose that a data warehouse for big-bazar consists of the four dimensions customer, city, product, and time, and two measures count and sales-amount. At the lowest conceptual level (i.e., for a given customer, city, product and time combination), the sales-amount measure stores the actual purchase amount of the customer. At higher conceptual levels, sales-amount stores the total purchase amount for the given combination.
- Draw a schema diagram for modeling the above data warehouse. State clearly the tables, facts & keys.
  - Starting with the base cuboid [customer, city, product and time], what specific OLAP operations should you perform in order to list the total sales amount of "product=computer" for each country.
  - Write the equivalent SQL syntax for the above operation.



**JALPAIGURI GOVERNMENT ENGINEERING COLLEGE**  
**[A GOVERNMENT AUTONOMOUS COLLEGE]**  
**JGEC/B.TECH/CSE/ HU601A/2023-24**  
**2024**

**PRINCIPLE OF MANAGEMENT**

Full Marks: 70

Times: 3 Hours

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*Candidates are instructed to write the answers in their own words as far as practicable.*

**GROUP-A**  
**[OBJECTIVE TYPE QUESTIONS]**

Answer *all* questions

- |                                    |        |
|------------------------------------|--------|
| 1. What is stress ?                | 5x2=10 |
| 2. What is group decision making ? | 2      |
| 3. What is SWOT analysis ?         | 2      |
| 4. What is code of ethics ?        | 2      |
| 5. What is corporate governance ?  | 2      |

**GROUP-B**  
**[LONG ANSWER TYPE QUESTIONS]**

Answer any *four* questions

- |                                                                                                                                                                                                                            |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 6. Write advantages and disadvantages of group decision making .what stress management steps can organization take to minimize stress among employees .What is importance of people management ?                           | 4x15=60<br>5+5+5 |
| 7. Write function of management .What is bureaucratic management ?Write its advantages and disadvantages .                                                                                                                 | 5+3+7            |
| 8. How are the leaders different from managers ? Discuss the various behavioral approaches to leadership .What are the ten commandments of effective leadership?                                                           | 4+6+5            |
| 9. Name and describe various external sources of recruitment available to organization. Discuss the various steps involved in the process of selection of candidate in job ?                                               | 7+8              |
| 10. Discuss the various stages in the marketing research process .What do you understand by marketing research ?What are the characteristics of effective marketing mix ?Discuss corporate governance growing importance . | 4+2+5+4          |
| 11. What is management .Write function and role of management .Why planning is extremely important in modern organization ?                                                                                                | 3+6+6            |