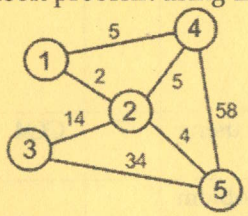
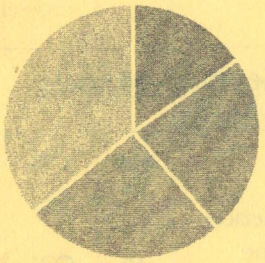
10	Briefly explain Merge Sort Algorithm with suitable example and derive its Time Complexity. Solve the Following using Merge Sort Algorithm 105,7,13,8,14,1,19,11,4,10,98,16,31,5,21,12	10	CO4	K2, K5	PO4
11	Briefly explain Quick Sort Algorithm with suitable example and derive its Time Complexity Solve the Following using Quick Sort Algorithm 17,9,22,31,7,12,10,21,13,29,18,12,11	10	CO2, CO3, CO4	K5	PO2
12	Solve the following instance of travelling sales person problem using Least Cost Branch Bound 	10	CO2, CO3, CO4	K1, K5	PO9

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

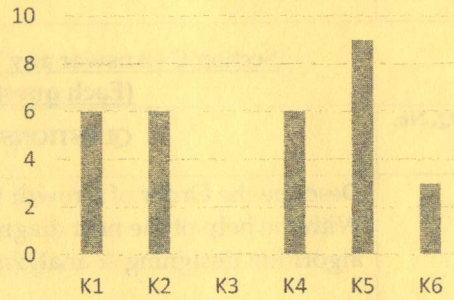
Course Outcomes	CO1	Understanding the basics of internet and its connections, web browsers
	CO2	Understanding client-server architecture and use in internet
	CO3	Able to configure basic LAN and connect computers to it.
	CO4	Able to combine HTML, CSS, JavaScript for form validation
	CO5	Understanding the implementation of PHP with database

GRAFICAL REPRESENTATION

Bloom level wise distribution



Cource outcome wise distribution



Note : This above figure is only Example and must prepare this type of figure in these two column

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JGI ARKAJAIN University Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	Bachelor of Computer Application	Program	BCA
Subject Name	Design & Analysis of Algorithm	Semester	3RD
		Year	2022/ Odd

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; don't Write on the 1st Page Backside
- Answer all Questions of Section A (Compulsory)
- Answer Any Four out of Six of Section B
- Answer Any ~~Two~~ Three out of ~~Four~~ Five of Section C
- Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes under Unfair Means and will Result in the Cancellation of the Papers.

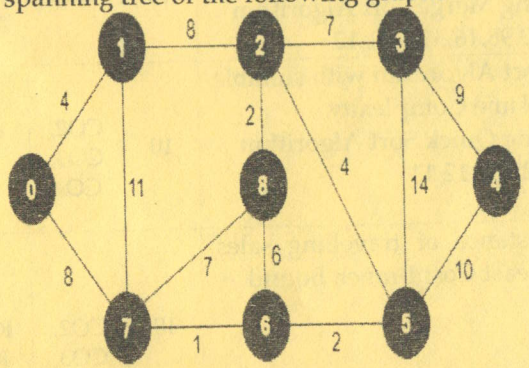
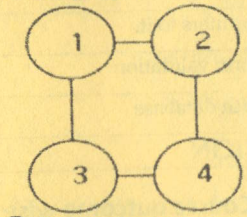
Knowledge Level (KL)			
	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 01 Marks from Q1-i to Q1-xii) – 12 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	How many passes does an insertion sort algorithm consist of? a) N b) N-1 c) N+1 d) N2	1	CO4	K4, K5	PO1
ii	Which of the following algorithm implementations is similar to that of an insertion sort? a) Binary heap b) Quick sort c) Merge sort d) Radix sort	1	CO4	K2	PO8
iii	What will be the number of passes to sort the elements using insertion sort? 14, 12,16, 6, 3, 10 a) 6 b) 5 c) 7 d) 1	1	CO1	K4	PO3
iv	Merge sort uses which of the following technique to implement sorting? a) backtracking b) greedy algorithm c) divide and conquer d) dynamic programming	1	CO1	K1	PO2
v	Find the pivot element from the given input using median-of-three partitioning method. 8, 1, 4, 9, 6, 3, 5, 2, 7, 0. a) 8 b) 7 c) 9 d) 6	1	CO2	K4	PO9

vi	What is the time complexity of Kruskal's algorithm? a) O(log V) b) O(E log V) c) O(E2) d) O(V log E)	1	CO4	K1	PO3
vii	Who published the eight queens puzzle? a) Max Bezzel b) Carl c) Gauss d) Friedrich	1	CO3	K2	PO6
viii	Prim's algorithm is also known as _____ a)Dijkstra algorithm b)Borůvka's algorithm c)Floyd–Warshall algorithm d) DJP Algorithm	1	CO3	K5	PO4
ix	What will be the best case time complexity of merge sort? a) O(n log n) b) O(n2) c) O(n2 log n) d) O(n log n2)	1	CO2	K1	PO1
x	Which of the following is true? a) Prim's algorithm can also be used for disconnected graphs b) Kruskal's algorithm can also run on the disconnected graphs c) Prim's algorithm is simpler than Kruskal's algorithm d) In Kruskal's sort edges are added to MST in decreasing order of their weights	1	CO1	K1	PO3
xi	Breadth First Search is equivalent to which of the traversal in the Binary Trees? a) Pre-order Traversal b) Post-order Traversal c) Level-order Traversal d) In-order Traversal	1	CO1	K6	PO1
xii	What is the worst case complexity of QuickSort? a) O(nlogn) b) O(logn) c) O(n) d) O(n2)	1	CO2	K6	PO6

Section B (Answer any FOUR out of SIX) – 28Marks
(Each question 7 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Consider the following instance of Knapsack problem N=3, M=20, (p1,p2,p3)=(25,24,15), (w1,w2,w3)=(18,15,10). Calculate Maximum profit, Minimum weight and Maximum profit per unit weight.	7	CO3	K4	PO9
3	Write the Prim's algorithm to find the minimum spanning tree.	7	CO4	K5	PO8
4	Apply Kruskal's algorithm to find the minimum spanning tree of the following graphs 	7	CO2, CO3, CO4	K4, K5	PO7
5	Briefly explain the n-queen problem using Backtracking. Explain its applications.	7	CO4	K5	PO6
6	Write an algorithm for how Eight Queens problem can be solved using backtracking and explain with an example	7	CO4	K6	PO3
7	Explain DFS with suitable example? Sketch the state space tree generated all possible 3-color,4-node graph 	7	CO3	K5	PO6

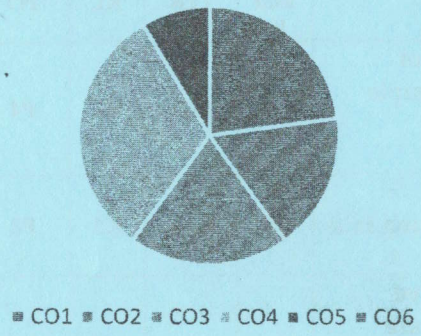
Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Describe the Order of Growth with time function. With the help of the neat diagram, explain the algorithm designing & analyzing process	10	CO1	K1	PO5
9	Explain the general plan for analyzing the time Efficiency for Recursive Algorithm. Solve the following Recurrence relations x(n) = 2x(n-3) for n >1, x(1) = 1	10	CO1	K4	PO7

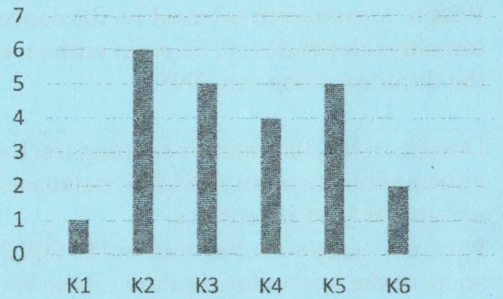
CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Understanding the basics of internet and its connections, web browsers
	CO2	Understanding client-server architecture and use in internet
	CO3	Able to configure basic LAN and connect computers to it.
	CO4	Able to combine HTML, CSS, JavaScript for form validation
	CO5	Understanding the implementation of PHP with database

Bloom level wise distribution



Cource outcome wise distribution



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ARKAJAIN University Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	**Bachelor of Computer Application**	Program	BCA
Subject Name	**Data Base Management System**	Semester	3RD
		Year	2022/ Odd

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; don't Write on the 1st Page Backside
- **Answer all Questions of Section A (Compulsory)**
- **Answer Any Four out of Six of Section B**
- **Answer Any Two out of Four of Section C**
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Knowledge Level (KL)			
	K1 : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 01 Marks from Q1-i to Q1-xii) – 12 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	1) A ..... does not have a distinguishing attribute if its own and most are dependent entities, which are part of some another entity. a) Weak entity b) Strong entity c) Non-attributes entity d) Dependent entity	1	CO1	K3	P2
ii	2) ..... is the complex search criteria in the where clause. a) Substring b) Drop Table c) Predict d) Predicate	1	CO1	K2	P1
iii	3) ..... is the preferred method for enforcing data integrity a) Constraints b) Stored Procedure c) Triggers d) Cursors	1	CO2	K3	P2
iv	4) The number of tuples in a relation is called its ..... While the number of attributes in a relation is called it's ..... a) Degree, Cardinality b) Cardinality, Degree c) Rows, Columns d) Columns, Rows	1	CO1	K5	P4
v	5) _____ is a predicate that we expect the database to always satisfy a) Assertion b) Reason c) Mandate d) Verify	1	CO1	K3	P5

vi	6) In SQL the spaces at the end of the string are removed by _____ function. a) Upper b) String c) Trim d) Lower	1	CO4	K5	P6
vii	7) _____ operator is used for appending two strings. a) & b) % c) || d) _	1	CO1	K1	P4
viii	) The union operation is represented by a) ∩ b) U c) – d) *	1	CO2	K2	P7
ix	9) The intersection operator is used to get the _____ tuples. a) Different b) Common c) All d) Repeating	1	CO3	K4	P6
x	10) The union operation automatically _____ unlike the select clause. a) Adds tuples b) Eliminates unique tuples c) Adds common tuples d) Eliminates duplicate	1	CO3	K2	P4
xi	11) If we want to retain all duplicates, we must write _____ in place of union. a) Union all b) Union some c) Intersect all d) Intersect some	1	CO2	K3	P5
xii	12) _____ clause is an additional filter that is applied to the result. a) Select b) Group-by c) Having d) Order by	1	CO5	K4	P5

Section B (Answer any FOUR out of SIX) – 28Marks

(Each question 7 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is Relational Database? How it is different from Database? Write down the characteristics.	7	CO4	K2	P1
3	What are the ACID properties? Explain.	7	CO1	K3	P3
4	Define Attributes. Explain different types of Attributes with examples of each.	7	CO5	K2	P2
5	Explain Functional dependency and Trivial functional dependency with examples.	7	CO2	K5	P5
6	What do you mean by Specialization, Generalization, and Aggregation? Explain giving examples.	7	CO4	K2	P2
7	Discuss the alternative diagrammatic notations for displaying ER diagrams.	7	CO4	K4	P4

Section C (Answer any TWO out of FOUR) – 30 Marks-

(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Which normal form is based on the concept of transitive dependency? Explain with an example the decomposition into 3NF.	**10**	CO1	K4	P4
9	Design an ER diagram for keeping track of information about an AIRLINE database taking into account at least six entities.	**10**	CO3	K5	P8
10	How are exceptions handled in PL/SQL? Give some of the internal exceptions' name What are stored-procedures? And what are the advantages of using them. What are cursors give different types of cursors	**10**	CO1	K6	P2
11	What is the need of the normalization? Explain the first three steps involved in the normalization.	**10**	CO5	K6	P2
12	Discuss the main characteristics of the database approach and how it differs from the traditional file system.	**10**	CO2	K5	P6

9	What is Python? Write down the various application areas of Python programming.	15	CO1	K4	PO7
10	How to declare constructor method in Python? Explain with the help of an Example.	15	CO2	K1, K4	PO1
11	What is String? How to search a particular Letter in a string? Explain with the help of an example.	15	CO2	K2	PO2

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Understanding the basics of internet and its connections, web browsers
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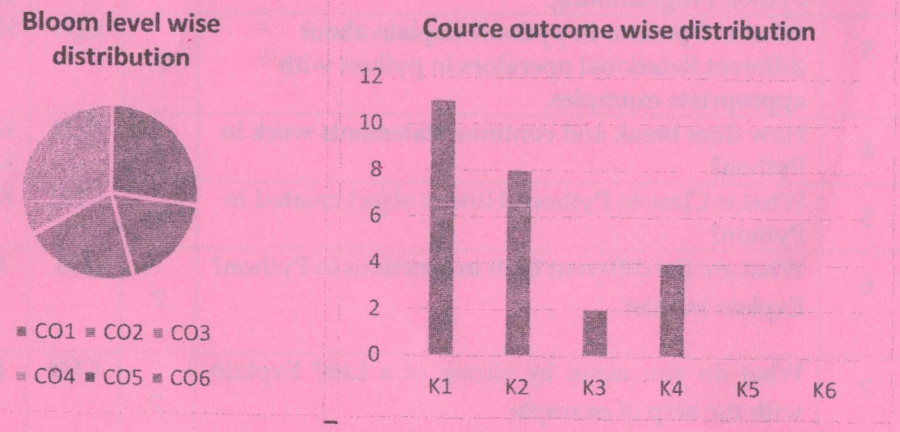

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ARKAJAIN University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	**Bachelor of Computer Application**	Program	BCA
Subject Name	**Python Programming**	Semester	3RD
		Year	2022/ Odd

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; don't Write on the 1st Page Backside
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Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 01 Marks from Q1-i to Q1-xii) – 12 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	What will be the output after the following statements? **m = 'ABC'** **for i in m:** **print(i, end=' ')** a. A b. ABC c. A B C d. I	1	CO1	K1	PO1
ii	What will be the output after the following statements? **m = 33** **if m > 33:** **print('A')** **elif m == 30:** **print('B')** **else:** **print('C')** a. C b. B c. A d. 33	1	CO2	K1	PO1
iii	What will be the data type of m after the following statement? **m = 'World Wide Web'** a. List b. String c. Dictionary d. Tuple	1	CO1	K2	PO7

iv	What will be the output after the following statements? **for m in range(2,9,3):** **print(m, end='')** a. 293 b. 369 c. 239 d. 258	1	CO2	K2	PO7
v	What will be the output after the following statements? **m = True** **n = False** **print('not n')** a. not n b. False c. True d. Not defined	1	CO1	K1	PO7
vi	What will be the output after the following statements? **m = 2** **while m < 5:** **print(m, end='')** **m += 2** a. 24 b. 246 c. 2468 d. 248	1	CO1	K1	PO8
vii	What will be the output after the following statements? **m = [25, 34, 70, 63]** **n = m[2] - m[0]** **print(n)** a. 25 b. 45 c. 70 d. 34	1	CO1	K2	PO1
viii	What will be the data type of m after the following statement? **m = {'A', 'F', 'R', 'Y'}** a. List b. Set c. Dictionary d. Tuple	1	CO2	K1	PO8
ix	What will be the data type of n after the following statements if the user entered the number 45? **m = input('Enter a number: ')** **n = int (m)** a. Float b. String c. List d. Integer	1	CO2	K2	PO7
x	What will be the output after the following statements? **m = 50** **n = 10** **m = m % n** **print(m)** a. 7 b. 70 c. 10 d. 0	1	CO3	K2	PO1
xi	What will be the output after the following statements? **def abc(m, n) :** **print(m - n)** **abc(14, 5)** a. (14, 5) b. 145 c. m – n d. 9	1	CO2	K1	PO1
xii	What will be the output after the following statements? **m = {'Listen' :'Music', 'Play' : 'Games'}** **n = m['Play']** **print(n)** a. Listen b. Music c. Play d. Games	1	CO1	K1	PO5

Section B (Answer any FOUR out of SIX) – 28Marks
(Each question 7 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	List out the advantages and disadvantages of Python Programming.	7	CO2	K2, K4	PO1
3	What is Operator in python? Explain about different Relational operators in python with appropriate examples.	7	CO1	K1	PO8
4	How does break and continue statements work in Python?	7	CO2	K1, K2	PO7
5	What is Class in Python? How is object created in Python?	7	CO2	K3	PO1
6	What are the different built in functions in Python? Explain in brief.	7	CO4	K4	PO8
7	What do you mean by slicing of a List? Explain with the help of example	7	CO2	K1	PO7

Section C (Answer any TWO out of Four) – 30 Marks-
(Each question Carry 15 Marks)

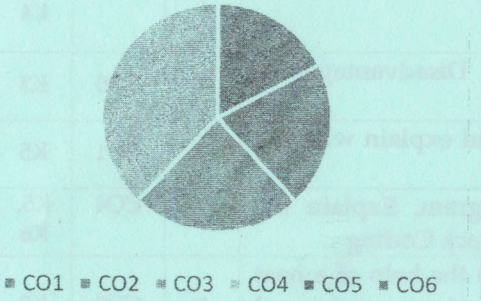
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	What do you mean by Loop? What are the different loop control statements available in python? Explain with the help of suitable example.	15	CO1	K3	PO1

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

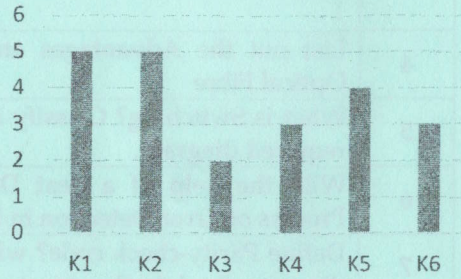
Course Outcomes	CO1	Analyze the topologies and network models.
	CO2	Understand the various network protocols, algorithms. Multiplexing, Error Detention, and Data Link Control.
	CO3	Analyze the Network Layer and Next Generation IP, Data-Link and Network-Layer Protocols
	CO4	Understand about the Wired Networks and Virtual LANs
	CO1	Analyze the topologies and network models.

GRAFICAL REPRESENTATION

Bloom level wise distribution



Cource outcome wise distribution



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ARKAJAIN University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	**Bachelor of Computer Application**	Program	BCA
Subject Name	**Data Communication and Networking**	Semester	3RD
		Year	2022/ Odd

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
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Knowledge Level (KL)			
	K1 : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 01 Marks from Q1-i to Q1-xii) – 12 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	Communication between a computer and a keyboard involves _____ transmission. a) Automatic b) Half-duplex c) Full-duplex d) Simplex	1	CO4	K2	PO1
ii	A _____ is the physical path over which a message travels. a) Path b) Medium c) Protocol d) Route	1	CO4	K4, K5	PO8
iii	Three or more devices share a link in _____ connection. a) Unipoint b) Multipoint c) Point to point d) Simplex	1	CO1	K4	PO3
iv	Which transmission media provides the highest transmission speed in a network? a) coaxial cable b) twisted pair cable	1	CO1	K1	PO2

	c) optical fiber d) electrical cable				
v	The physical layer is concerned with _____ a) bit-by-bit delivery b) process to process delivery c) application to application delivery d) port to port delivery	1	CO2	K3	PO9
vi	Bits can be sent over guided and unguided media as analog signal by _____ a) digital modulation b) amplitude modulation c) frequency modulation d) phase modulation	1	CO4	K1	PO3
vii	The physical layer translates logical communication requests from the _____ into hardware specific operations. a) data link layer b) network layer c) trasnport layer d) application layer	1	CO3	K2	PO6
viii	Wireless transmission of signals can be done via _____ a) radio waves b) microwaves c) infrared d) all of the mentioned	1	CO3	K5	PO4
ix	Which of the following is false with respect to TCP? a) Connection-oriented b) Process-to-process c) Transport layer protocol d) Unreliable	1	CO2	K1	PO1
x	TCP process may not write and read data at the same speed. So we need _____ for storage. a) Packets b) Buffers c) Segments d) Stacks	1	CO1	K1	PO3
xi	Communication offered by TCP is _____ a) Full-duplex b) Half-duplex c) Semi-duplex d) Byte by byte	1	CO1	K6	PO5
xii	The value of acknowledgement field in a segment defines _____	1	CO2	K6	PO6
	a) sequence number of the byte received previously b) total number of bytes to receive c) sequence number of the next byte to be received d) sequence of zeros and ones				

Section B (Answer any FOUR out of SIX) – 28Marks
(Each question 7 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Explain Analog to digital conversion with proper diagram	7	CO2	K1, K2	PO8
3	Explain the TCP/IP reference model with neat diagram	7	CO3	K2, K4	PO7
4	List out the Advantages and Disadvantages of Optical Fibre	7	CO3	K3	PO4
5	What is Switching? Classify and explain with the required diagram.	7	CO1	K5	PO3
6	With the help of a neat Diagram, Explain the Process of Error Detection in Block Coding	7	CO4	K5. K6	PO8
7	Define Parity-check code? with the help of a neat diagram, Explain the structure of an encoder and decoder for simple Parity-check code?	7	CO2	K2	PO9

Section C (Answer any TWO out of FOUR) – 30 Marks-
(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain the OSI reference model with neat diagram.	15	CO1	K1, K2	PO7
9	Explain the Following a. Multiplexing b. ICMPV6 c. UDP d. L2CAP e. Email	15	CO3	K2, K3 K4, K5, K6	PO7
10	With the help of a neat diagram, Explain the process of Checksum	15	CO3	K4	PO4
11	With the help of a neat flow diagram, explain HDLC.	15	CO2	K3	PO2