S4 CSE QUESTION BANK

COMPUTER SCIENCE & ENGINEERING

VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY TECHNICAL CAMPUS
KILIMANOOR
(A unit of Vidya International Charitable Trust)
Accredited by NAAC with "B++" grade

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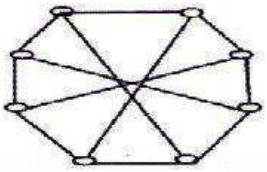
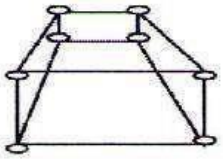
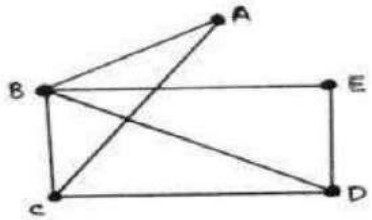
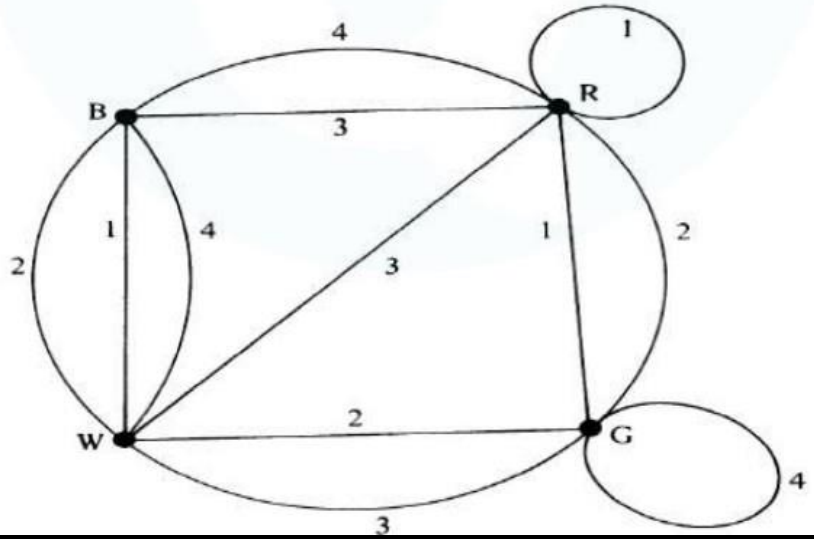
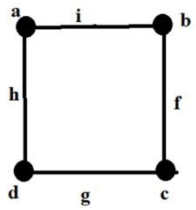
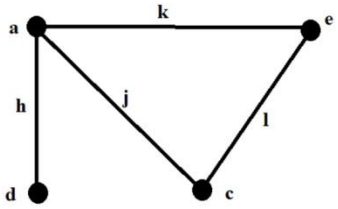
QUESTION BANK
MAT 206 - GRAPH THEORY

MODULE 1			
Sl. No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	Consider a graph G with 4 vertices: V_1, V_2, V_3 and V_4 and the degrees of vertices are 3,5,2 and 1 respectively.Is it possible to construct such a graph G? If not, why?	3	Dec17, Dec19
2	Draw a disconnected simple graph G_1,with 10 vertices and 4 components and also calculate the maximum number of edges possible in G_1.	3	Dec17
3	What are the basic conditions to be satisfied for two graphs to be isomorphic? Are the two graphs below isomorphic? Explain with valid reasons.  	6	Dec17, Dec 18, Dec19, Sept 2020, June 2022
4	Write any two applications of graphs with sufficient explanation.	3	Dec17
5	Prove that the number of vertices of odd degree in a graph is always even.	3	Dec18 June 2022
6	Show that in a simple graph with n vertices, the maximum number of edges is $\frac{n(n-1)}{2}$ and the maximum degree of any vertex is $n-1$.	3	Dec18, Sept 2020 July 2021 June 2022
7	Prove that a simple with n vertices and K components can have atmost $\frac{(n-k)(n-k+1)}{2}$ edges.	3	Sept 2020, July 2021
8	If a connected graph G is decomposed into two subgraphs g_1 and g_2 , then prove that there must be at least one vertex common between g_1 and g_2.	3	Dec18, June 2022
9	Write a note on Konigsberg Bridge Problem	3	Sept 2020

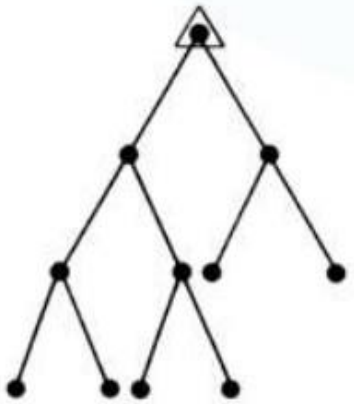
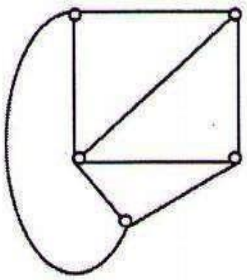
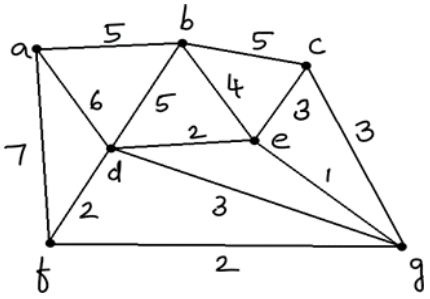
10	Differentiate walk, path and circuit. Using the graph classify each sequence as a walk,a path or a circuit 1. E→C→D→E 2. A→C→D→E→B→A 3. B→D→E→B→C 4. A→B→C→D→B→A 	3 4.5	Sept 2020 July 2021 June 2022
11	a) Define subgraphs.What are edge disjoint and vertex disjoint subgraphs? Construc two edge disjoint subgraphs of the graph G. 	4	Sept 2020
12	Is it possible to have simple graphs with the following degree sequences? If yes, draw the graphs a)2,3,3,3,3,3,4,5 b)1,3,3,4,5,6,6 c)1,2,3,3,4,5,	5	Sept 2020
13	If a graph has exactly two vertices of odd degree, then prove that there must be a path joining these two vertices.	7	June 2022
14	There are 25 telephones in Metropolis. Is it possible to connect them with wires so that each telephone is connected with exactly 7 others? Why?	3	July 2021
15	Define complete graph and complete bipartite graph. Draw a graph which is a complete graph as well as a complete bipartite graph.	7	July 2021
16	Define isolated vertex, pendant vertex, even vertex and odd vertex. Draw a graph that contains all the above.	7	July 2021

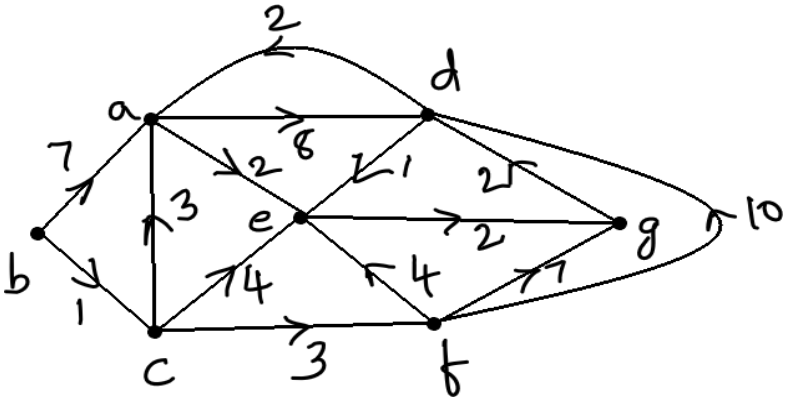
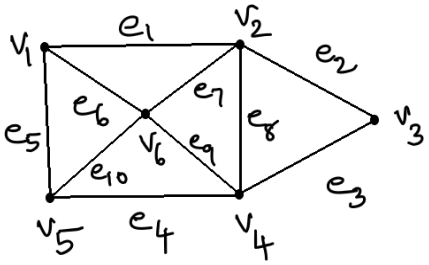
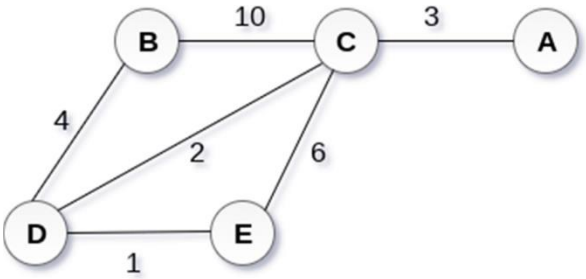
MODULE 2			
Sl. No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	Define Hamiltonian circuits and paths with examples. Find out the number of edge-disjoint Hamiltonian circuits possible in a complete graph with five vertices. Define Hamiltonian circuit and Hamiltonian path. Give an example for each. Also draw a graph that has a Hamiltonian path but not a Hamiltonian circuit	5 7	Dec 17 Sept 2020 June 2022
2	StateTravelling-Sales man Problem and how TSP solution is related with Hamiltonian Circuits?	5	Sept 2020, July 2021
3	Differentiate between symmetric and asymmetric digraphs with examples and draw a complete symmetric digraph of four vertices. Differentiate between complete symmetric and complete asymmetric graph with an example each.	4	Dec 17 Dec 19
4	Consider a complete graph G with l1 vertices. a) Find the maximum number of edges possible in G. b) Find the number of edge-disjoint Hamiltonian circuits in G	4	Dec 18
5	A connected graph G is a Euler graph if and only if it can be decomposed into circuits.	6	Dec18
6	Explain digraphs and binary relation on digraphs.	4	Sept 2020
7	Explain arbitrarily traceable graphs with suitable examples.	4	Sept 2020
8	Draw a graph which is Eulerian but not Hamiltonian	3	June 2022
9	Distinguish between strongly connected digraphs and weakly connected graphs with examples.	3	June 2022
10	In a complete graph with n vertices, prove that there are $\frac{n-1}{2}$ edge-disjoint Hamiltonian circuits, if n is an odd number ≥ 3.	7	June 2022, July 2021
11	1)For a binary relation "is greater than" on the set X= {3.4,7,5,8} i) Draw the digraph representing the above relation ii) Write its relation matrix 2)Define equivalence digraph with an example	7	June 2022
12	Prove that a connected graph G is an Euler graph if and only if all vertices of G are of even degree.	7	June 2022
13	Show that all vertices of an Euler graph G are of even degree	3	July 2021

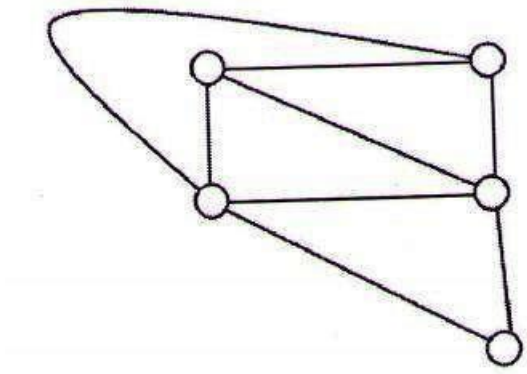
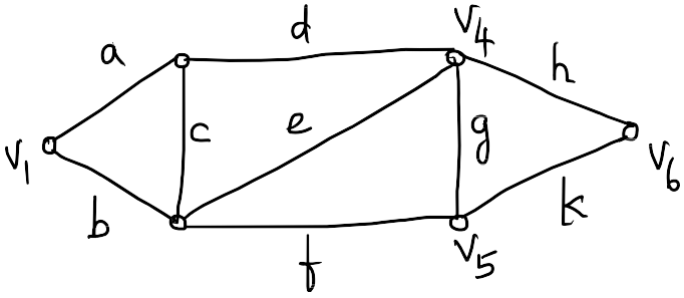
14	Explain strongly connected and weakly connected graphs with the help of examples.	3	July 2021
15	  Find the union, intersection and ring sum of the above graphs.	9	July 2021
16	For which values of m, n is the complete graph Km,n an Euler graph ? Justify your answer.	7	July 2021

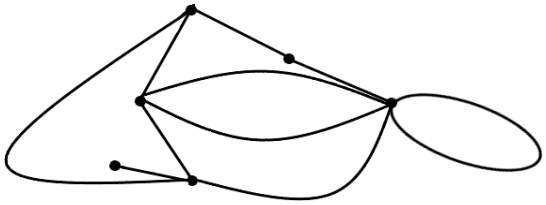
MODULE 3

Sl. No	Questions	Marks	KTU/KU Month/Year
1	Find the number of possible labeled trees that can be constructed with 50 vertices.	2	Dec 18
2	Consider a binary tree with four weighted pendent vertices. Let their weights be 0.5, 0.12, 0.13 and 0.11. Construct a binary tree with minimum weighted path length.	3	Dec18
3	Define spanning tree. Show that the edges forming a spanning tree in a planar graph G correspond to the edges forming a set of chords in the dual G*.	5	Dec 18
4	Draw the flow chart of the spanning tree algorithm and also clearly mark the five conditions to be tested in connection with the spanning tree construction in the flowchart.	6	Dec 18
5	Define a rooted binary tree with an example. Draw all trees of n labeled vertices for n = 3 and n=4.	5	Sept 2020
6	Prove that there is one and only one path between every pair of vertices in a tree.	3	June 2022
7	Draw all unlabelled trees with 5 vertices. How many labelled trees are there with n vertices? Draw all labelled trees with 3 vertices.	3 3	June 2022 July 2021

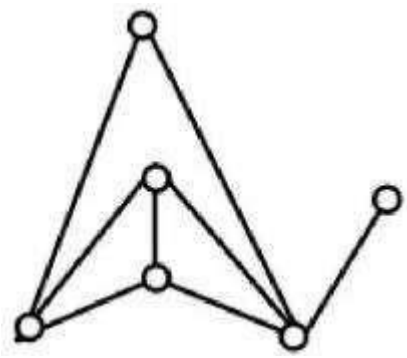
8	Define rooted binary tree. Find the path length of the following tre 	4	Sept 2020
9	Define spanning trees. Consider the graph G given below and obtain any three spanning trees from G. Calculate the number of distinct spanning trees possible from a complete graph with n vertices. 	5	Dec 17
10	Let G= (V,E) be a connected graph, and let T:=(V, S) be a spanning tree of G. Let e = (a, b) be an edge of G not in T. Prove that, for any edge f on the path from a to b in T, (V, (Su{e}) -{f}) is another spanning tree for G.	4	Dec 17
11	Apply Kruskal's algorithm to find the minimal spanning tree for the following weighted graph. 	7	June 2022

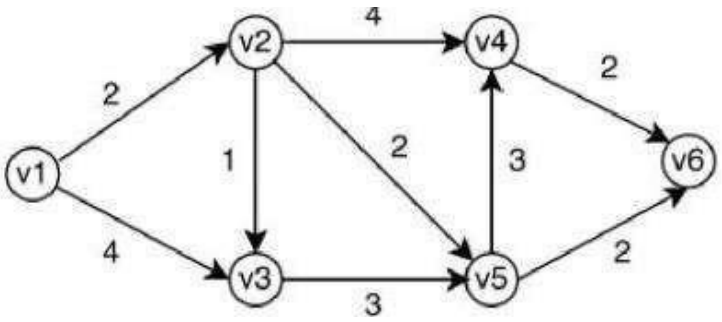
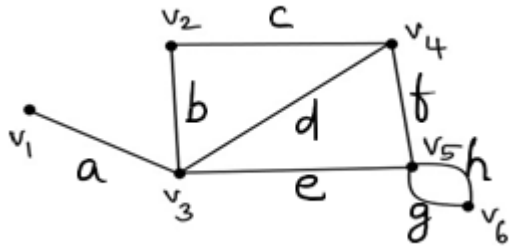
12	Use Dijkstra's algorithm to find the shortest path for the following weighted digraph and find the shortest distance from vertex a to other vertices. 	7	June 2022, July 2021
13	For any spanning tree of a connected graph with n vertices and e edges, prove that there are n-1 tree branches and e-n+1 chords. For the following graph find two spanning trees and hence show that an edge that is a branch of one spanning tree can be a chord with respect to another spanning tree of same graph. 	7	June 2022
14	Using Prims algorithm, find a minimal spanning tree for the following graph. 	7	July 2021
15	Prove that every tree has either one or two centers. Prove that a binary tree with n vertices has (n+1)/2 pendant vertices.	7 7	June 2022, July 2021
16	Prove that a connected graph G with n vertices and n-1 edges is a tree.	3	July 2021

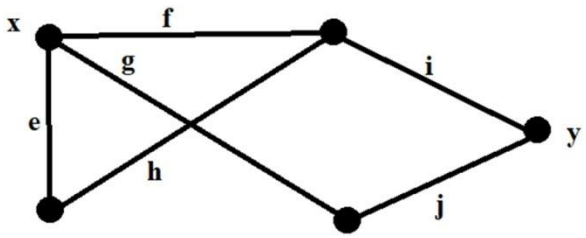
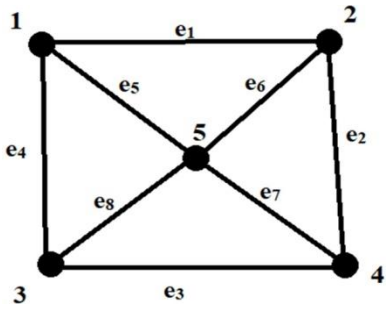
MODULE 4			
Sl. No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	Prove the statement: Every cut set in a connected graph G must also contain atleast one branch of every spanning tree of G	3	Dec 17
2	List down the properties stating the relationship between the edges of graph G and its dual G	3	Dec 17
3	Draw two Kuratowski's graphs and also prove that Kuratowask's first the graph is nonplanar using appropriate inequality.	4	Dec 17
4	Draw a geometric dual(G*) of G given and also write about the relationship between a planar graph G and its dual G* 	6	Dec 18
5	Prove the statement "Every circuit has an even number of edges in common with any cut-set".	4	Dec 18
6	Prove that the edge connectivity of a graph cannot exceed the degree of the vertex with the smallest degree in G.	3	June 2022
7	Illustrate the statement: "The ring sum of any two cut-sets in a graph is either a third cut-set or an edge disjoint union of cut-sets", in the following graph. 	7	June 2022

8	Define edge connectivity, vertex connectivity separable and non-separable graph. Give an example for each.	7	June 2022
9	Prove that the complete graph on 5 vertices is non-planar	7	June 2022
10	Draw the geometric dual of the following graph 	7	June 2022
11	Define planar graphs. Is K4, the complete graph with 4 vertices, a planar graph? Justify. Define planar graph and non-planar graph with examples.	3 3	July 2021 June 2022
12	Define fundamental circuits and fundamental cut-sets.	3	July 2021
13	Define cut-set. Prove that every circuit in G has an even number of edges in common with any cut-set. Let G be a connected graph and e an edge of G. Show that e is a cut-edge if and only if e belongs to every spanning tree.	8 5	July 2021
14	Construct the geometric dual of the graph below	6	July 2021
15	Prove that a connected planar graph with n vertices and e edges has e-n+2 regions.	9	July 2021

MODULE 5

Sl. No	Questions	Marks	KTU/KU Month/Year
1	List down any four properties of the adjacency matrix.	4	Dec 18
2	Construct an adjacency matrix (X) for the following graph and also mention how the concept of edge sequences is described with $X^{3.}$ 	6	Dec 18

3	Two graphs G_1 and G_2 are isomorphic if and only if their incidence matrices A(G_1) and A(G_2) differ only by permutation of rows and Columns	6	Dec 17
4	Let A and B be, respectively, the circuit matrix and incidence matrix of a self-loop-free graph G. Prove that $AxB^T=0(mod2)$	4	Dec 17
5	Define adjacency matrix and construct a graph from the following $\begin{pmatrix} 0 & 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 \end{pmatrix}$ adjacency matrix:	4	Dec 17
6	Write the Dijkstra's shortest path algorithm. Apply this algorithm to find the shortest path between v1and v6.  Write an algorithm for the shortest path between all pairs of vertices.	10 7	Dec 17 Sept 2020
7	For the following graph find the i. Incidence matrix ii. Path matrix between v2 and v5 iii. Circuit matrix  	7	June 2022
8	Explain Floydwarshall algorithm with suitable examples. Explain planarity with examples.	10 5	Sept 2020

9	Define chromatic number. What is the chromatic number of a tree with two or more vertices? Prove that the chromatic polynomial of a complete graph with 4 vertices is $\lambda(\lambda-1)(\lambda-2)(\lambda-3)$.	3 3	July 2021 June 2022
10	Draw a connected graph and show that the rank of its incidence matrix is one less than the number of vertices.	7	June 2022
11	Show that chromatic polynomial of a tree with n vertices is $P_n(\lambda) = \lambda(\lambda-1)^{n-1}$ Prove that every tree with two or more vertices is 2-chromatic	7 7	July 2021 June 2022
12	Prove that a covering g of a graph is minimal if and only if g contains no path of length three or more.	7	June 2022
13	Explain four colour problem using the concept of chromatic number.	5	July 2021
14	Let B and A be the circuit matrix and the incidence matrix of a graph G which is free from loops, whose columns are arranged using the same order of edges. Show that ABT=BAT=0 (mod 2).	9	July 2021
15	Define path matrix of a graph. Find the path matrix P(x, y) for the graph below. 	7	July 2021
16	Construct the adjacency matrix and incidence matrix of the graph . 	3	July 2021 June 2022

Course Code : CST 202

Course Name: Computer Organization and Architecture

Module I			
Sl. No	Questions	Marks	Year
1	Compare auto increment and auto decrement addressing modes with examples	3	July 2021
2	Illustrate the basic operation concepts in transferring data between memory and processor with diagram	4	July 2021
3	Outline the steps involved in the execution of an instruction	3	July 2021
4	Identify the addressing modes that can be used for representing the following higher level language constructs in machine level. Illustrate each addressing mode using an example. 1) Arrays 2) Pointers 3) Constants 4) Variables	4	July 2021
5	Illustrate the single bus organization of the processor unit with the help of suitable diagrams. Explain, listing the control signals, how the following operations are handled in this organization. i) Transfer contents of register R5 to R1 ii) Move (R6), R2 (Fetch a word from memory and move it to register R2, when the memory address is stored in register R6)	10	July 2021
6	Outline the differences in instruction execution during straight line sequencing and branching using suitable examples.	7	July 2021
7	Differentiate between big endian and little endian byte ordering. Consider a computer that has a byte addressable memory organized as 32 bit words. A program reads ASCII characters entered at a keyboard and stores them in successive byte locations, starting at location 1000. Show the contents of the two memory words at locations 1000 and 1004 after the name Johnson has been entered in case: i) Big Endian Byte ordering is used ii) Little Endian Byte ordering is used (ASCII equivalent of characters in Johnson in hex will be 4A, 6F, 68, 6E, 73,6F, 6E. You can indicate unused byte locations using XX).	7	July 2021
8	Name the registers which are connected to both external and internal bus? What are the signals associated with these registers?	3	June 2022

9	Compare and contrast single bus and multi-bus organization of CPU?	4	June 2022
10	Write the three-address, two-address and one-address representations of the operation below with relevant assumptions, evaluate following: i, (A+B) * (C+D) ii, C<- [A] + [B]	10	June 2022
11	With the help of a neat figure, describe the data path inside the processor?	6	June 2022
12	Draw the diagram of single bus organization, write the control sequence for the instruction ADD [R2],R3 for the above mentioned single bus organization.	8	June 2022

	Module II		
1	How is the two port memory organization of the processor unit better when compared to scratch pad memory organization?	3	July 2021
2	Give the block diagram of circuit that implements following statements in register transfer logic: T1; C ←A T5: C ←B	3	July 2021
3	Illustrate and explain the organization of a processor unit where processor registers and ALU are connected through common buses. Explain how the micro operation R2 ← R3+R4 would be performed using this organization, where R2, R3 and R4 are processor registers.	7	July 2021
4	Explain with the help of a block diagram the design of a 4 bit status register for an 8 bit ALU. The four status bits are C (carry), S(sign), Z(zero) and V (overflow). Clearly indicate the purpose of each status bit and how they are set or reset.	7	July 2021
5	Design and draw a combinational logic shifter using multiplexers with two selection variables, H1 and H0. The operations of shifter should be as specified in the following table: H_1 | H_0 | Operation | Function 0 | 0 | S←0 | Transfer 0's to S 0 | 1 | S←shl F | Shift left F into S 1 | 0 | S←shr F | Shift right F into S 1 | 1 | S←F | No shift	10	July 2021

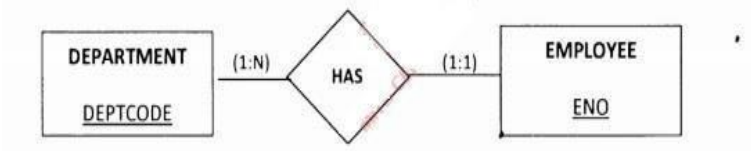
6	Describe about arithmetic, logic and shift micro operations, listing the available operations in each category.	4	July 2021
7	Write the register transfer logic format for a conditional control statement, Give an example?	3	June 2022
8	Discuss the logic used behind the booth multiplication algorithm	3	June 2022
9	Describe processor organization with diagram using i) scratchpad memory ii) Two-port memory iii) Accumulator register	10	June 2022
10	Draw and explain about true/complement circuit?	4	June 2022
11	Give the structure of status register, which is connected to 8bit ALU .	8	June 2022
12	Design 4-bit combinational logic shifter which will perform the operation given below with 2 control variable H1&H0? i) Shrl ii) clear iii) Load all bits with 1	6	June 2022
	Module III		
1	Draw the flowchart for Booth's Multiplication Algorithm	3	July 2021
2	Illustrate Read After Write (RAW) hazard with an example	3	July 2021
3	Outline the hardware requirement for multiplying two binary numbers in sign magnitude format and specify a flowchart for same. Illustrate the algorithm, showing the contents of registers, for the multiplication of 11111 by 10101	8	July 2021
4	Explain the various pipeline structures available inside a computer	6	July 2021
5	Design and draw the block diagram for a 4 by 3 array multiplier.	8	July 2021
6	Explain the various method available to get rid of data hazards inside the system	6	July 2021
7	Draw a 3X2 array multiplier?	3	June 2022
8	Discuss about pipeline hazards?	3	June 2022
9	Draw the flowchart and explain restoring division method with an example?	6	June 2022
10	Describe in detail about data hazards and resolution techniques?	8	June 2022
11	Draw the flowchart of Booth's multiplication algorithm and multiply -5 X -4 using booths algorithm?	8	June 2022

12	Identify the various types of hazards occurring during the execution of the following program in a pipelined system. Where the pipeline consist of five stages, opcode fetch , instruction decode, operand fetch, execution, store the result. All stages take equal time duration MOV [R1],[R2] MOV R3,[R1] SUB R2,R3 ADD R1,R3 CALL 5000 MOV R2,R3	6	June 2022
	Module IV		
1	Explain PLA based control organization with the help of a diagram	3	July 2021
2	Differentiate between horizontal and vertical microinstructions	3	July 2021
3	Illustrate the working of a micro program sequencer with the help of diagrams	7	July 2021
4	Outline with the help of a block diagram, how a micro program control unit can be used for controlling the processor unit.	7	July 2021
5	Illustrate the steps for designing a micro programmed control circuit for the addition and subtraction of binary numbers in sign magnitude form. Specify the block diagram of control circuitry and the binary microprogram for control memory.	14	July 2021
6	Write a note on micro-program control?	3	June 2022
7	What are different types of control organization?	3	June 2022
8	With the help of a diagram explain the functioning of a micro-program sequencer in a micro-programmed controlled processor?	10	June 2022
9	Compare instruction formats of horizontal and vertical microinstructions?	4	June 2022
10	Explain the organization of micro-programmed computer with a block diagram?	8	June 2022
11	Explain with an example one flip-flop per state method of control organization?	6	June 2022
	Module V		
1	List and explain the different types of ROMs	3	July 2021
2	Explain the term locality of reference. How is this related to cache memory?	3	July 2021

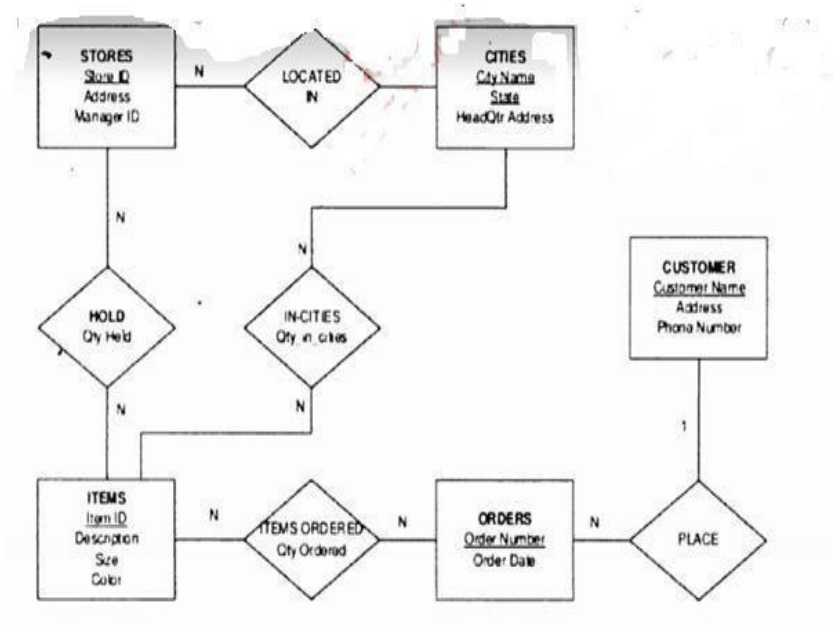
3	Explain with examples the three types of mapping functions used in cache memory	7	July 2021
4	What are interrupts? Outline the actions taking place in a processor once an interrupt has been raised.	7	July 2021
5	What is a DRAM? Compare the two types of DRAMs, highlighting their differences.	7	July 2021
6	Outline how Direct Memory Access is implemented? Differentiate between cycle stealing DMA and burst mode DMA.	7	July 2021
7	What are interrupts, List the sequence of steps following an interrupt request?	3	June 2022
8	Which design feature of SRAM cells helps in value retention without refresh?	3	June 2022
9	Explain in detail about the mechanisms for accessing I/O devices?	9	June 2022
10	Discuss about different types of read only memories?	5	June 2022
11	Explain internal organization of 1 K X 8 memory chip with suitable diagram	5	June 2022
12	How does the various mapping scheme present in cache memory differ from each other.	9	June 2022

Course code: CST 204

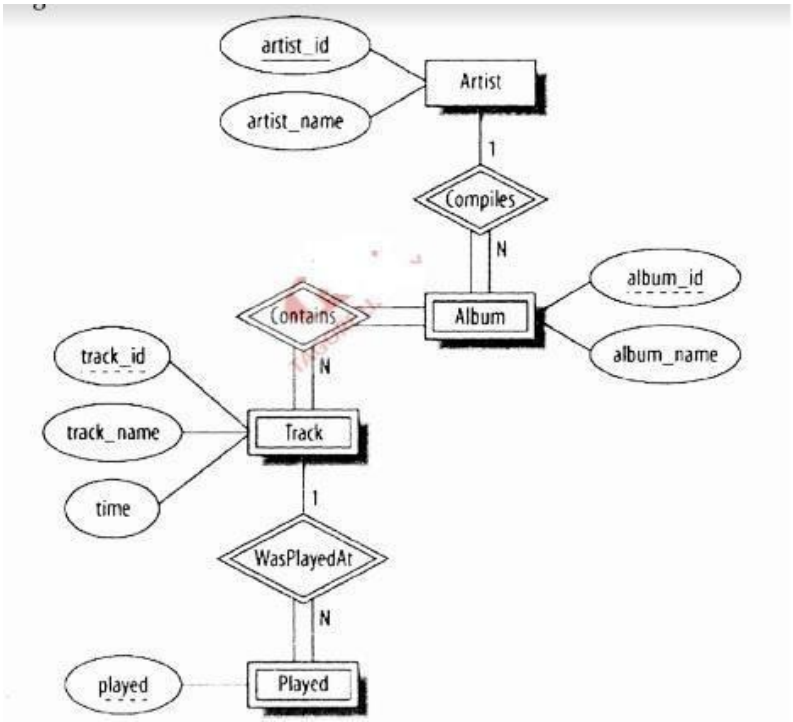
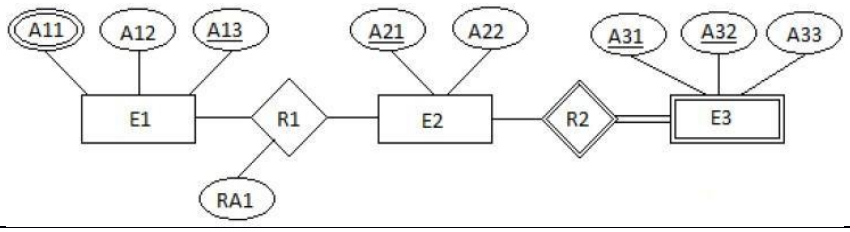
Course Name: Database Management Systems

Module I			
Sl. No	**Question**	**Marks**	**Year**
1	List any three categories of users, highlighting any one important characteristic of each category	3	April 2018,July 2021
2	What are the major difference between structured, unstructured and semi structured data.	3	July 2021
3	Give suitable examples for multi valued, composite and multi-valuedcomposite attributes	3	April 2018
4	Distinguish between total and partial participation constraints with the help of examples.	4	April 2018
5	List out any threes salient features of database systems.	3	JUNE 2017,JUNE 2022
6	Explain the responsibilities of DBA	3 3	JULY 2017 DEC 2018
7	Define the following terms (i) Data Model (ii)Database Scheme (iii)Meta-data	3	JULY 2017
8	With the help of a neat diagram explain the three-schema architecture of DBMS	9	JULY 2017
9	Explain the following terms briefly (a) Participation constraint (b) Overlap Constraint (c) Covering Constraint	9	JULY 2017
10	Can we represent the situation modelled by the ER diagram without relationship "Has". If so, draw new diagram.If not give reasons(Entitiesare EMPLOYEE and DEPARTMENT).Attribute names are given under Entity names;Keys are underlined. 	3	JUNE 2017
11	Give *good* examples (using ER notation) for unary and ternary relationshipswith a *very brief* explanation.	3	DEC 2018

12	Consider a scenario where artists act in movies: an artist can act in *different* movies and movie can have *many*artists. Assuming suitable attributes show how the situation can be represented using relations withforeign keys. (A relational schema showing primary and foreign keys is sufficient. Minimal number of attributes is required)	3	DEC 2018
13	Illustrate with an example, the difference between the conceptual datamodels and the physical data models.	3	MAY 2019
14	A company has the following scenario: There are a set of salespersons. Some of them manage other salespersons. However, a salesperson cannot have more than one manager. A salesperson can be an agent for many customers. A customer is managed by exactly one salesperson. A customer can place any number of orders. An order can be placed by exactly one customer. Each order lists one or more items. An item may be listed in many orders. An item is assembled from different parts and parts can be common for many items. One or more employees assemble an item from parts. A supplier can supply different parts in certain quantities. A part may be supplied by different suppliers.	7	July 2021
15	Draw an ER diagram based on the following information, • Manufacturers have a name, which we may assume is unique, an address, and a phone number • Products have a model number and a type. Each product is made by one manufacturer, and different manufacturers may have different products with the same model number. However, you may assume that no manufacturer would have two products with the same model number • Customers are identified by their unique social security number. They have email addresses, and physical addresses. Several customers may live at the same (physical) address, but we assume that no two customers have the same email address • An order has a unique order number, and a date. An order is placed by one customer. For each order, there are one or more products ordered, and there is a quantity for each product on the order.	7	June 2022
Module II			

1	In the ER diagram below, names of entity sets and relationship are shownin capital and corresponding attributes are listed under each name. Key attributes are underlined. All the participation are total. Use the standardsynthesis procedure to convert ER diagram into corresponding relational schema. Clearly show foreign keys and primary keys.  	6	JUNE 2017
2	Consider the relation R(A,B,C,D) where A is a key of R. Write any threerelational algebra equivalent $A, B = (\sigma A = 2, B=3(R))$	3	JUNE 2017
3	Study the tables given below and write relational algebra expressions forqueries that follow,	9	JUNE 2017

	STUDENT(ROLLNO,NAME,AGE,GENDER,ADDRESS,ADVISOR) COURSE(COURSEID,CNAME,RESULTS) PROFESSOR(PROFID,PNAME,PHONE) ENROLLMENT(ROLLNO,COURSEID,GRADE) Primary Keys are underlined. ADVISOR is a foreign key referring to PROFESSOR table. ROLLNO and COURSEID in ENROLLMENT are also foreign keys referring to the primary keys with same name. (i) Name of the female students (ii) Name of Male students along with advisor name (iii) Roll Number and name of students who have not enrolled for any course.		
4	Consider the query SELECT NAME,AGE FROM STUDENT WHERE GENDER=MALE on the table. STUDENT(ROLLNO,NAME,AGE,GENDER,ADDRESS).Give a relational algebra expression corresponding to the query. Is the result produced by query and your expression always same?Why?	3	JUNE 2017
5	Consider the database with primary keys underlined Suppliers(SID, Sname, address) Parts(pid, Pname, color) Catalog(Sid,Pid, Cost) Sid is the key or suppliers,pid is the key of parts, and sid and pid together form the key of the catalog. The catalog relation lists the price charged by suppliers. Write relational algebra for the following queries. (i) Find the names of suppliers who supply some red part. (ii) Find the sids of suppliers who supply some red or green part. (iii) Find the sids of suppliers who supply some red part and some green part.	9	JULY 2017
6	The relation schema for library describing members, books, and issue information is given below. Foreign keys have the same name as primary keys, BOOKS(ACC_NO,ISBN,TITLE,EDITION,YEAR) MEMBERS(MEMBERID,MEMBENAME,MEMBERTYPE) ISSUETO(ACC_NO,MEMBER_ID,DATEOFISSUE)	9	April 2018

	Write relational algebra for the following queries (i) ACCESSION NUMBER(S) and Name(s) of third edition booksPublished in 2018 (ii) Name and dates of issue of books taken by a member withname "PRIYA" (iii) Names of books not taken by any member		
7	Use standard synthesis procedure to generate the set of relations corresponding to the ER Diagram below. Identify primary key and foreign key of generated relations 	4 4	April 2018 Dec 2018
8	What is meant by referential integrity? How is it implemented usingforeign key?Illustrate using a real example	5	April 2018
9	What is entity integrity constraint? Why is it important?	3	May 2019,JUNE 2022
10	Using the following ER diagram, create a relation database. Give your assumptions. 	3	May 2019

11	Consider the following relations for a database that keeps track of business trips of salespersons in a sales office: SALESPERSON(Ssn, Name, StartYear, DeptNo) TRIP(Ssn, FromCity, ToCity, DepartureDate, ReturnDate, TripId) EXPENSE(TripId, AccountNo, Amount) a) A trip can be charged to one or more accounts. Specify the foreign keys for this schema, stating any assumptions you make. b) Write relation algebra expression to get the details of salespersons who have travelled between Mumbai and Delhi and the travel expense is greater that Rs. 50000. c) Write relation algebra expression to get the details of salesperson who had incurred the greatest travel expenses among all travels made.	9	MAY 2019
12	List the basic data types available for defining attributes in SQL?	5	July 2021
	Consider the following schema, Suppliers (sid , sname, address) Parts (pid, pname, color) Catalog (sid, pid, cost) The primary key fields are underlined. Write relational algebra expressions for the following queries: b) Find the name of parts supplied by supplier with sid=105 ii) Find the names of suppliers supplying some green part for less than Rs 1000 iii) Find the IDs of suppliers who supply some red or green part iv) Find the names of suppliers who supply some red part	8	JUNE 2022
13	Differentiate between the following SQL statements i) DROP and DELETE ii) ALTER and UPDATE	6	JUNE 2022
14	Write SQL DDL statements based on the following database schema (Assume suitable domain types): Employee (eid, name, designation, salary, comp_id) Company (comp_id, cname, address, turnover) i) Create the above mentioned tables assuming each company has many employees. Mention the primary key, foreign key and not null constraints. ii) Insert values into both the tables. Mention in which order insertions will be carried out. ii) Modify the table Employee to include a new column “years_of_exp” iv) Increment the	8	JUNE 2022

	salary of employees whose salary is less than Rs25000 by 5%		
15	Illustrate any three ways of using INSERT statement in SQL	6	JUNE 2022
Module III			
1	Illustrate use of assertion with an example	3	April 2018
2	Illustrate the concept of trigger in SQL with an example	3	July 2021
3	Consider two tables STUDENT(ROLLNO,NAME,CLASS) and Enrollment(ROLLNO,COURSENAME) where ROLLNO in Enrolment is a foreign key referring to STUDENT.It is required that every time a STUDENTtuple is deleted, all the Enrolment tuples referring to the deleted STUDENT tuples are also deleted. Write SQL statements to specify this foreign key requirement	3	April 2018
4	Consider the following relations FACULTY(FNO,NAME,GENDER,AGE,SALARY,DNUM) DEPARTMENT(DNO,DNAME,DPHONE) COURSE(CNO,CNAME,CREDITS,ODNO) TEACHING(FNO,CNO,SEMESTER) DNUM i a foreign key that identifies the department to which a faculty belongs.ODNO is a foreign key identifying the department that offersthe course.Write SQL expressions for the following queries Course numbers and names of 3-credited courses offered by “CS”	9	April 2018

	Department. Name of faculty members teaching 3 subjects. Nam of departments along with number of courses offered by each of them,in the increasing order of number o courses,Exclude department whichdo not offer any course.		
5	For the relations listed below,Write SQL statements for the update thatfollow(Assume suitable domain names for attributes) ALBUMS(ALBUM_ID,ALBUM_NAME,PRODUCED_BY,YEA R) SONGS(SONG_ID,SONG_START,DURATION,ALBUM_ID) (iv) Update the year of the album with name "SUHANA RATH" to 2018 (v) Delete the album "yadon ki barish" along with all songs in it.	5	April 2018
6	In the following tables ADVISOR and TAUGHTBY are foreign keys referring to the table PROFESSOR. ROLLNO and COURSEID in ENROLLMENT refer to tables with primary keys of the same name. STUDENT(ROLLNO,NAME,AGE,GENDER,ADDRESS,ADVS IOR) COURSE(COURSEID,CNAME,TAUGTBY,CREDITS) PROFESSOR(PROFID,PNAME,PHONE) ENROLLMENT(ROLLNO,COURSEID,GRADE) Write SQL expressions for the following queries (iv) Name of course taught by prof "raju" (v) Name of students who have not enrolled for any coursetaught by prof "ganapthy" (vi) For each course, name of course and number of students enrolled for the course	9	JUNE 2017
7	In the relational schema for a library given below, foreign keys have the same name as primary keys. Draw an ER diagram for the schema, clearlymarking keys and cardinality constraints BOOKS(ACC-NO, TITLE, EDITION, YEAR)	5	DEC 2018

	MEMBERS(MEMBERID, MEMBERNAME, MEMBERTYPE)ISSUEDTO(ACC-NO, MEMBERID, DATEOFISSUE)		
8	With the help of an example, illustrate the use of SQL TRIGGER.	3	MAY 2019
9	Illustrate structure of B-Tree and B+ Tree and explain how they are different? 5	5	July 2021
10	A file has r =20000 STUDENT records of fixed length. Each record has the following fields: NAME (30 bytes), SSN (9 bytes), ADDRESS (40 bytes), PHONE(9 bytes), BIRTHDATE (8 bytes), GENDER (1 byte), DEPTID (4 bytes), CLASSCODE (4 bytes), and PROGID (3 bytes). An additional byte is used as a deletion marker. The file is stored on the disk with block size B=512 bytes, Calculate the record size R in bytes. Calculate the blocking factor bfr and the number of file blocks b assuming an unspanned organization. Calculate the average time it takes to find a record by doing a linear search	3	JUNE 2022
11	For the relation schema below, give an expression in SQL for each of the queries that follows: employee (ID, person_name, street, city) works (ID, company_name, salary) company (company_name, city) manages (ID, manager_id) i) Find the employees whose name starts with 'C' ii) Find the name of managers of each company iii) Find the ID, name, and city of residence of employees who works for "First Bank Corporation" and earns more than Rs50000 iv) Find the name of companies whose employees earn a higher salary, on average, than the average salary at "First Bank Corporation"	8	JUNE 2022
12	Differentiate correlated and non-correlated nested queries with suitable examples	6	JUNE 2022
13	What is multi-level indexing? How does it improve the efficiency of searching an index file?	8	JUNE 2022
14	Insert the following keys, in the order given, into a B -tree of order 3: {10, 50, 20, 5, 22, 25}	6	JUNE 2022
Module IV			
1	What is meant by Transitive dependency ?Give one example	3	APRIL 2018
2	When do you say that two functional dependencies are equivalent	3	APRIL 2018
3	Given a relation R(A1,A2,A3,A4,A5) with functional dependencies A1->A2A4 and A4->A5 check if the decomposition A(A1,A2,A3)R2(A1,A4) and R3(A2,A4,A5) is lossless	9	APRIL 2018
4	Briefly discuss BCNF and three #NF with suitable example	4	APRIL 2018

5	Determine any two candidate keys of the relation R(A,B,C,D,E,F) with FDs AB->C,C->AD,D->EF,F->B	3	JUNE 2017
6	Give an example for a relation that has insertion, deletion and update anomalies. Which type(S) of functional dependency can formally model these anomalies?Quote one such dependency with your example	3	JUN E 2017
7	Consider a relation R(A,B,C,D,E,F) with A as the only key. Assume thatdependencies E->F, C->DEH hold on R. Is R in 2NF?if not,Decompose into 2NF Is R in	6	JUN E 2017

	3NF?if not, decompose to 3NF		
8	Assume that the relation R(P,Q,S,T,U) with FDs, P->S,Q->S,S->T,TU->S,SU->P is decomposed into 5 relations.R1(P,T) R2(P,Q) R(Q,U),R4(S,T,U)and R5(P,U).Apply standard algorithm to test if the decomposition is lossless join decomposition.	9	JUNE 2017
9	Define Boyce code Normal form(BCNF).Give an example of a relation that is in 3NF but not in BCNF	3	JULY 2017,JUNE 2022
10	Let E={B->A,D->A,AB->D}is a set of functional dependencies. Find a minimal cover for E	3	JULY 2017
11	Write an algorithm to compute the attribute closure of a set of attributes (X) under a set of functional dependencies (F). Explain three uses of attribute closure algorithm.	10	July 2021
12	Explain the difference between BCNF and 3NF with an example	4	July 2021
13	Suppose, a relational schema R (P,Q, R, S) and set of functional dependencies F and G are as follow: F : { P → Q, Q → R, R → S } G : { P → QR, R → S }. Check the equivalency of functional dependencies F and G.	3	JUNE 2022
14	Consider a relation R(A, B, C, D, E) with FDs AB → C, AC → B, BC → A, D → E. Determine all the keys of relation R. Also decompose the relation into collections of relations that are in BCNF.	8	JUNE 2022
15	Consider a relation schema R (A,B,C,D) with the following functional dependencies A → B, B → C, C → D, D → B. Determine whether the decomposition of R into R1 (A , B) , R2 (B , C) and R3 (B , D) is lossless or lossy. Write the complete steps.	6	JUNE 2022
	Module V		
1	How concurrency is controlled using time stamp ordering	10	JULY 2017
2	Explain the concept behind the following (i)Log based recovery(ii)Deferred database modification	10	JULY 2017
3	Explain the characteristics of GIS	3 8	JULY 2017 DEC 2018
4	What are the constraints in GIS?	4	JULY 2018

5	Argue that two-phase ensures serializability	4	JUNE 2017, APRIL 2018
6	hat is the significance of check-pointing ?Illustrate with typical example	5	JUNE 2017
7	Illustrate lost update and dirty read problem with the help of an example	4	JUNE 2017
8	List out salient features of big data	3 3 4 3	JJUNE 2017, APRIL 2018 DEC 2018 MAY 2019
9	How is GIS databases different from conventional databases	3	JUNE 2017, APRIL 2018
10	Write a small RDF document and show its equivalent graph structure	4	JUNE 2017
11	Discuss four ACID properties and its importance	6	APRIL 2018,JUNE 2022
12	How conversions of locks are achieved in concurrency control?	3	July 2021
13	Check whether the given schedules are conflict serializable or not i) S1 : R1(X) , R2(X) , R1(Y) , R2(Y) , R3(Y) , W1(X) , W2(Y) ii) S2 : R1(X) , R2(X) , R2(Y) , W2(Y) , R1(Y) , W1(X)	6	JUNE 2022
14	What is two phase locking protocol? How does it guarantee serializability?	6	JUNE 2022
15	What are the main characteristics of NOSQL systems in the areas related to data models and query languages?	8	JUNE 2022

CST 206 OPERATING SYSTEMS

MODULE 1

Sl. No	Questions	Marks	KTU/KU Month/Year
1	Discuss the functions of an Operating System.	9	KU MARCH 2017
2	How does the distinction between kernel mode and user mode function as a basic form of protection system?	6	KU JUNE 2017,KTU JUNE 2022
3	How do clustered system differ from multiprocessor system?	3	KU JUNE 2017
4	Why does an Operating system require dual-mode and multi-mode operations?	3	KU APRIL 2018
5	What is the need for system calls in Operating System?	3	KU MAY 2019
6	How does the hardware find the Operating System kernel after system switch-on?	3	KU DEC2019
7	Why does an Operating System require dual mode operations?	3	KU DEC2019
8	Write short notes on clustered systems	3	KU DEC2019
9	Differentiate between the operating System structures?	3	KU DEC2019 KU DEC2018
10	Explain the process of booting	3	KU DEC2019
11	Write the difference between timesharing systems and multiprogrammed systems	3	KU SEP 2020
12	How many times “Welcome” will be printed for the following code? `void main() { fork(); fork(); fork(); printf (“Welcome\n”);}`	3	KU SEP 2020,KTU JUNE 2022
13	What is the purpose of a system call?Describe how a system call made by a user application is handled?	7	KTU JUNE 2022
14	Explain the micro kernael approach to system design with the help of a diagram.How do user programs and kernel services interact in microkernel architecture	7	KTU JUNE 2022
15	Explain layered architecture in OS .Point out its advantages and	5	KU SEP 2020

	disadvantages.		

MODULE 2

Sl. No	Questions	Marks	KTU/KU Month/Year
1	Discuss the different states of a process.	3	KU MARCH 2017 KU JULY 2017 KU APRIL 2018 KU DEC 2018
2	What is meant by Process Control Block? Discuss it's significance.	9/4.5	KU MARCH 2017 KU MAY 2017 KU JULY 2017 KU DEC 2018
3	Explain Context switching in detail.	9	KU MARCH 2017,KTU JUNE 2022
4	Briefly discuss Process Creation and Termination procedures.	9	KU MARCH 2017
5	Draw the Gantt Chart , find the average waiting time for the following algorithms i) FCFS ii) Pre-emptive Priority iii)Non-pre emptive priority Process / Arrival Time(ms) / Burst time(ms) / Priority P1 / 0 / 8 / 4 P2 / 2 / 6 / 1 P3 / 2 / 1 / 2 P4 / 1 / 9 / 2 P5 / 3 / 3 / 3	9	KU DEC 2018,KTU JUNE 2022
6	The long term scheduler directly affects the system performance. Explain how.	3	KU MAY 2019
7	A writer process like to send some bulk information to a reader process. Explain the IPC mechanism that can be used for the purpose.	9	KU MAY 2019

<table>
<tr><td>8</td><td>Find the average waiting time and average turnaround time for the processes given in the table below using:- i) SRT scheduling algorithm ii) Priority scheduling algorithm
<table>
<tr><th>Process</th><th>Arrival Time (ms)</th><th>CPU Burst Time (ms)</th><th>Priority</th></tr>
<tr><td>P1</td><td>0</td><td>5</td><td>3</td></tr>
<tr><td>P2</td><td>2</td><td>4</td><td>1</td></tr>
<tr><td>P3</td><td>3</td><td>1</td><td>2</td></tr>
<tr><td>P4</td><td>5</td><td>2</td><td>4</td></tr>
</table></td><td>9</td><td>KU MAY 2019</td></tr>
<tr><td>9</td><td>Write any three criteria to be considered for comparing CPU scheduling algorithms?</td><td>3</td><td>KU DEC 2019</td></tr>
<tr><td>10</td><td>In a message passing system how the send() and receive() operations and communication link implemented in case of direct and indirect communication.</td><td></td><td>KU SEP 2020</td></tr>
<tr><td>11</td><td>What is 4 situations under which cpu scheduling decisions take place.</td><td>3</td><td>KU SEP 2020</td></tr>
<tr><td>12</td><td>What is meant by race condition?Explain with the help of an example.</td><td>3</td><td>KTU JUNE 2022</td></tr>
<tr><td>13</td><td>List and explain the various synchronous and asynchronous methods of message passing in IPC.</td><td>3</td><td>KTU JUNE 2022</td></tr>
<tr><td>14</td><td>Consider the following set of processes, with the length of the CPU burst time given in milliseconds.
<table>
<tr><th>Process</th><th>Burst time</th><th>Arrival time</th></tr>
<tr><td>P1</td><td>13</td><td>0</td></tr>
<tr><td>P2</td><td>9</td><td>2</td></tr>
<tr><td>P3</td><td>5</td><td>2</td></tr>
<tr><td>P4</td><td>7</td><td>3</td></tr>
</table>
i) Draw Gantt chart to show execution using pre-emptive SJF and Round Robin (time quantum=3) scheduling.
ii) Calculate average waiting time for each of the above scheduling algorithms.</td><td>6</td><td>KU SEP 2020</td></tr>
<tr><td>15</td><td>Explain the different states of a process and transition between them with the help of a diagram</td><td>5</td><td>KTU JUNE 2022</td></tr>
</table>

MODULE 3

Sl. No	Questions	Marks	KTU/KU Month/Year
1	What is meant by Critical Section? Explain.	6	KU MARCH 2017,KTU JUNE 2022

2	Explain resource allocation graph with an example	8	KU MARCH 2017,KTU JUNE 2022
3	Show that if the wait and signal operations are not executed automatically then mutual exclusion may be violated.	9	KU MARCH 2017 KU JULY 2017
4	Suppose that a system is in unsafe state.Show that it is possible for the process to complete their execution without entering a deadlock state.	9	KU MARCH 2017
5	Consider a banking system that maintains an account balance with two functions: deposit (amount) and withdraw (amount). These two functions are passed the amount that is to be deposited or withdrawn from the bank account balance. Assume that a husband and wife share a bank account. Concurrently, the husband calls the withdraw() function and the wife calls deposit(). Describe how a race condition is possible and whatmight be done to prevent the race condition from occurring.	6	KU JUNE 2017
6	What are the conditions which may lead to deadlock?	4	KU JUNE 2017
7	What is Dining Philosopher's Problem? Explain.	5	KU JULY 2017,KTU JUNE 2022
8	How can test and set instruction be used to ensure mutual exclusion?	3	KU APRIL 2018
9	How does the signal() operation associated with monitors differ from the corresponding operation defined for semaphores?	3	KU APRIL 2018
10	Explain how semaphores can be used to solve Readers-Writers problem.	6	KU APRIL 2018
11	What do you mean by deadlock? What are the four necessary conditions for a deadlock to occur?	3	KU APRIL 2018
12	Consider a system with four processes P1, P2, P3, P4, and four types of resources R1, R2, R3, R4. The maximum no: of instances of resources of each type are 5, 7, 7 and 7 respectively. What will be the order of processing of jobs if the allocated matrix and the maximum claim (that each process can claim) matrix are as given below.	6	KU APRIL 2018

	<table><tr><th colspan="4">Allocated Matrix</th><th colspan="4">Maximum Claim</th></tr><tr><th></th><th>R1</th><th>R2</th><th>R3</th><th>R4</th><th>R1</th><th>R2</th><th>R3</th><th>R4</th></tr><tr><td>P1</td><td>2</td><td>1</td><td>3</td><td>2</td><td>3</td><td>5</td><td>6</td><td>4</td></tr><tr><td>P2</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td>3</td><td>4</td><td>6</td></tr><tr><td>P3</td><td>1</td><td>2</td><td>1</td><td>1</td><td>1</td><td>4</td><td>3</td><td>2</td></tr><tr><td>P4</td><td>1</td><td>1</td><td>0</td><td>2</td><td>2</td><td>3</td><td>1</td><td>2</td></tr></table>		
13	Write an algorithm that satisfies all the critical-section requirements for n process.	9	KU MAY 2019
14	Define semaphore with its operations. What are the two types of Semaphores?	9	KU DEC 2019
15	Consider the following snapshot of a system with five processes P0,P1, P2, P3, P4 and four resources A,B,C and D <table><tr><th>Process</th><th>Max</th><th>Allocation</th><th>Available</th></tr><tr><td></td><td>A B C D</td><td>A B C D</td><td>A B C D</td></tr><tr><td>P0</td><td>0 2 1 0</td><td>0 1 1 0</td><td>1 5 2 0</td></tr><tr><td>P1</td><td>1 6 5 2</td><td>1 2 3 1</td><td></td></tr><tr><td>P2</td><td>2 3 6 6</td><td>1 3 6 5</td><td></td></tr><tr><td>P3</td><td>0 6 5 2</td><td>0 6 3 2</td><td></td></tr><tr><td>P4</td><td>0 6 5 6</td><td>0 0 1 4</td><td></td></tr></table>Using Banker's algorithm, answer the following questions:- i) How many instances of resources A, B, C, D are there? ii) What is the content of Need matrix? iii) Is the system in a safe state? If it is, find the safe sequence.	9	KU DEC 2019,KU SEP 2020

MODULE 4

Sl. No	Questions	Marks	KTU/KU Month/Year
1	Discuss the following allocation algorithms. (i) First Fit (ii) Best Fit (iii) Worst Fit	10	KU MARCH 2017
2	Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB. How would each of the First fit Best-Fit and Worst-Fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB ?	10	KU MARCH 2017

3	Differentiate between Paging and Segmentation.	10	KU MARCH 2017
4	What is the function of a translation look-aside buffer (TLB).	5	KU JUNE 2017,KTU JUNE 2022
5	Compare the memory organization schemes of contiguous memory allocation, pure segmentation, and pure paging with respect to thefollowing issues: i. External fragmentation ii. Internal fragmentation iii. Ability to share code across processes	6	KU JUNE 2017,KTU JUNE 2022
6	With a diagram, explain how paging is done with TLB.	6	KU APRIL 2018,KTU JUNE 2022
7	Given six memory partitions of 100KB,500 KB,200 KB,300 KB,600 KB (in order),how would the first-fit, best-fit and worst-fit algorithms place processes of size 212KB,417 KB,112 KB,426KB(in order). Rank the algorithms in terms of how efficiently they use memory.	5	KU DEC 2018
8	Differentiate logical address and physical address with an example.	4	KU MAY 2019 KU DEC 2019
9	What is dynamic storage-allocation problem with respect to contiguous memory allocation? Discuss the three strategies that act as a common solution to this problem.	6	KU MAY 2019
10	Consider the reference string: 8 4 6 4 3 5 8 4 3 2 3 5 8. Assuming demand paging with four frames, how many page faults would occur for:- i) FIFO replacement algorithm ii) Optimal replacement algorithm	6	KU MAY 2019
11	Does paging suffer from fragmentation? Explain.	6	KU MAY 2019 KU SEP 2020
12	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)? Rank the algorithms in terms of how efficiently they use memory.	5	KU DEC 2019
13	Find the number of page faults for the following page reference string with 3 page frames for Optimal page replacement and LRU algorithms. 2 3 4 2 1 3 7 5 4 3	7	KU DEC 2019
14	Consider the following page reference string : 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0 Indicate page faults and calculate total number of page faults for FIFO algorithm, assuming that number of frames as three and four. Remember initially all the frames are empty. Check whether Belady's anomaly happens.	7	KU SEP 2020
15	Calculate the number of page faults for the following reference string with three page frames,using the following algorithm. 9,2,3,1,2,5,3,4,6,9,9,1,0,5,4,6,2,3,0,1 (i)FIFO (ii)Optimal (iii)LRU	9	KTU JUNE 2022

MODULE 5

Sl. No	Questions	Marks	KTU/KU Month/Year
1	Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving arequest at cylinder 2,150, and the previous request was at cylinder 1,805. The queue of pendingrequests, in FIFO order, is:2,069, 1,212, 2,296, 2,800, 544, 1,618, 356, 1,523, 4,965, 3,681 Starting from the current head position, what is the total distance (in cylinders) that the disk arm movesto satisfy all the pending requests for each of the following disk-scheduling algorithms? i) FCFS ii) SSTF iii) SCAN	6	KU JUNE 2017
2	Explain various file operations	10	KU JULY 2017
3	The read write head is at 97. The head is moving from 299 to 0. Requests are in the order 94, 82, 101, 110, 198, 75, 87, 124, 136. How much time is required by the system if the system is following: i) Shortest seek time first. ii) C-Scan. iii) Elevator algorithm. Assume 1 head movement takes 1 ms.	6	KU APRIL 2018
4	Explain sequential access and direct access methods	5	KU APRIL 2018
5	Explain indexed allocation method with an example diagram	5	KU APRIL 2018
6	How are bad blocks in disks managed?	4	KU APRIL 2018
7	What is the significance of access rights associated with each file in a system?	6	KU MAY 2019
8	How can we make a new magnetic disk ready for use (to store files)?	5	KU MAY 2019
9	Explain FCFS, SSTF and SCAN disk scheduling algorithms, using thegiven disk queue of requests: - 20, 89, 130, 45 and 180. Assume that, the disk has 200 platters ranging from 0 to 199 and the current position of head is at cylinder 100.	10	KU MAY 2019
10	Total cylinders in a disk is 5000 [0-4999]. Header is at position 143; previous request is for 125, request queue is 86,1470, 913, 1774, 948, 1509, 1022, 1780, 130 Find the seek time for (i) FCFS (ii) SSTF	4	KU DEC 2019

11	Explain any two file allocation methods	5	KU DEC 2019
12	Write short notes on protection domain	6	KU SEP 2020
13	Differentiate physical fomatting and logical formatting of magnetic disk	6	KU SEP 2020
14	Describe linked and indexed allocation methods for files with the help of neat diagrams	10	KTU JUNE 2022
15	Suppose that a disk drive has 200 cylinders numbered from 0 to 199 and the current position of the head is at cylinder 100.For the given disk queue of requests:20,89,130,45,120,and 180 draw the head movement in FCFS,SSTF,CSCAN disk schduling algorithm and compute the total head movements(in cylinkders) in ecah.	9	KTU JUNE 2022

MCN 202 CONSTITUTION OF INDIA

Module 1			
Sl No	**Questions**	**Marks**	**KTU,Year**
1	Explain the salient features of Indian Constitution	3 6 8 3	July 21 July 2021 (AN) July 21 June 22
2	What do you mean by federal system of government? Give an example	3	July 2021 (FN)
3	What is preamble? Explain the importance of preamble in the implementation of Constitution	6 3 3	July 2021 July 2021 (AN) June 22
4	Explain different ways for acquiring Indian citizenship.	8	July 2021 (FN)
5	Write notes on methods of termination of Indian citizenship.	6	July 2021 (FN)
6	Define the Constitution. Why is it necessary for a Country	3	July 2021 (AN)
7	Define Constitution of India with comparison with other countries.	7	June 22
8	Discuss the term Union and its Territory.	7	June 22
9	Explain the term citizenship and its types.	7	June 22
10	What is Preamble? Can it be used for the interpretation of the constitution? Also explain its significance	8	July 2021 (AN)
11	Give detail account on the historical background of Indian Constitution	6	July 2021 (AN)
12	What is citizenship? Discuss the various methods of acquiring Indian citizenship	8	July 2021 (AN)
13	How Indian Citizenship can be acquired.	7	June 22

Module 2			
Sl No	**Questions**	**Marks**	**KTU,Year**
1	Explain the concept of " Equality before Law"	3	July 2021 (FN)
2	"No person shall be prosecuted and punished for the same offence more than once". Discuss this clause	3	July 2021 (FN)
3	Explain the concept of appeal by special leave	6	July 2021 (FN)
4	Discuss the classification of Directive Principles of State Policy in detail	8	July 2021 (FN)
5	What do you mean by right against exploitation? Explain	7	July 2021 (FN)
6	Distinguish between fundamental rights and directive principles of state policy	7	July 2021 (FN)
7	How is State defined under Article 12 of Indian Constitution	3	July 2021 (AN)
8	What is the basic difference between Fundamental Rights and Directive Principles of State Policy?	3	July 2021 (AN)
9	Describe the Rights to Constitutional Remedies and explain its significance	6	July 2021 (AN)
10	Explain the needs and importance of fundamental duties of Indian Citizen	8	July 2021 (AN)
11	What are the fundamental duties of an Indian citizen?	7	June 22
12	Explain the term fundamental rights and its classification.	8 7	July 2021 (AN) June 22
13	State the Directive Principles of State Policy and explain its significance	6 7	July 2021 (AN) June 22
14	Differentiate Rights and Duties with example.	3	June 22
15	What protection are available to the Indian citizen against conviction?	3	June 22
16	Explain right against exploitation and right to constitutional remedies.	7	June 22

Module 3			
Sl No	**Questions**	**Marks**	**KTU,Year**
1	Explain the procedure for impeachment of the President of India.	3	July 2021 (FN)
2	Explain the role of the Attorney General for India	3	July 2021 (FN)
3	Give the duties of Attorney General.	3	June 22
4	Explain the powers of President of India.	8	July 2021 (FN)
5	Explain the constitutional position and essential qualifications of Vice-president of India.	6	July 2021 (FN)
6	Explain the qualification and disqualification for membership in the house of the people.	8	July 2021 (FN)
7	Explain various kinds of jurisdiction of Supreme Court	6	July 2021 (FN)
8	Explain the procedure for impeachment of the President of India.	3	July 2021 (AN)
9	Mention the Powers and Functions of the Attorney General for India	3	July 2021 (AN)
10	Explain various kinds of jurisdiction of Supreme Court of India	7	July 2021 (AN)
11	Explain the constitutional duties and powers of the Prime Minister	7	July 2021 (AN)
12	Explain the functions and powers of the President of India.	8	July 2021 (AN)
13	Explain in detail about the Union Government structure and functions	6	July 2021 (AN)
14	Write five specialties of Supreme court.	3	June 22
15	Explain how Union Executive is elected and formed.	7	June 22

16	What are the different functions of Parliament?	7	June 22
17	Differentiate Rajya Sabha and Lok Sabha with five points.	7	June 22
18	How can a citizen can be qualified and disqualified as an MP?	7	June 22

Module 4			
Sl No	**Questions**	**Marks**	**KTU,Year**
1	Explain the procedure for the appointment of chief minister	3	July 2021 (FN)
2	Explain the duties of advocate general of the state.	3	July 2021 (FN)
3	Explain the powers and functions of the Governor of Kerala state.	6	July 2021 (FN)
4	Explain the composition and duration of state legislative council	8	July 2021 (FN)
5	Explain the qualification and disqualification for membership of the state legislature	7	July 2021 (FN)
6	Explain the constitution of the High court. What are the essential qualifications required for the appointment of High court Judge?	7	July 2021 (FN)
7	What are the constitutional provisions relating to freedom of trade, commerce and intercourse	3	July 2021 (AN)
8	List out the three types of emergencies under Indian constitution	3	July 2021 (AN)
9	Describe the duties and role of Comptroller and Auditor General of Indian (CAG)	8	July 2021 (AN)
10	Examine the administrative and financial relation between the Union and the State	6	July 2021 (AN)
11	Enumerate the powers and functions of Public Service Commission	8	July 2021 (AN)
12	Explain the characteristics of Administrative Tribunals. What are the reasons for the growth of Administrative Tribunals in India	6	July 2021 (AN)
13	Explain Writ Jurisdiction.	3	June 22

14	Explain the role of Governor.	3	June 22
15	Differentiate state Government and Union Territory.	7	June 22
16	Explain State Legislative Assembly in detail.	7	June 22
17	Discuss about Jurisdiction of High court.	7	June 22
18	Explain State Legislative Council in detail	7	June 22

Module 5			
Sl No	**Questions**	**Marks**	**KTU,Year**
1	Discuss the functions of comptroller and auditor general of India	3	July 2021 (FN)
2	Explain the distribution of tax revenue with respect to centre-state financial relation.	3	July 2021 (FN)
3	Explain parliamentary legislation in the state field	6	July 2021 (FN)
4	Discuss the effects of national and financial emergencies	8	July 2021 (FN)
5	Explain the procedure for amendment of the constitution	6 3	July 2021 June 22
6	What is the need for administrative tribunals? Explain the functions of state administrative tribunals	8	July 2021 (FN)
7	Why administrative tribunals are established ?	3	June 22
8	Why do we need to form separate Union Territories	3	July 2021 (AN)
9	Distinguish between an ' Ordinary Bill' and 'Money Bill'	3	July 2021 (AN)
10	Explain the various writs issued by High court of Kerala	6	July 2021 (AN)
11	Discuss the constitutional position and powers of Governor	8	July 2021 (AN)
12	Explain the functions of the State Legislature	8	July 2021 (AN)
13	Explain the responsibilities and functions of Council of Ministers to State Legislative Assembly	6	July 2021 (AN)
14	How is Central and State Government related on economic basis?	7	June 22
15	Explain how the constitution handles an emergency situation in the country.	7	June 22

16	Which are the functions of Comptroller and Auditor General of India	7	June 22
17	Explain the role of Public Service commission.	7	June 22

Course Code: HUT 200

Course Name: Professional Ethics

Module I			
Sl. No	**Questions**	**Marks**	**Years**
1.	Define empathy. What is the difference between empathy and sympathy?	**3**	Dec 2021
2.	What is a civic virtue and how is it related to respect for others?	**3**	Dec 2021
3.	Explain the role of caring and sharing in a workplace.	**5**	Dec 2021
4.	How integrity plays a major role in work ethics. Discuss with suitable examples	**9**	Dec 2021
5.	Explain the need for cooperation and commitment.	**8**	Dec 2021
6.	Write a note on “Social Expectations”.	**6**	Dec 2021
7.	Why is sharing and caring are important for a professional?	**3**	Dec 2020
8.	Define work Ethics	**3**	Dec 2020
9.	With the help of examples, distinguish between ‘morality’ and ‘ethics’.	**7**	Dec 2020
10.	Explain the different aspects of academic integrity.	**7**	Dec 2020
11.	Explain the different types of human values	**7**	Dec 2020
12.	Explain the role of Cooperation and commitment in ethical practice.	**7**	Dec 2020
Module II			
1.	Compare and contrast tradition and custom. Give an example	**3**	Dec 2021

2.	Explain Normative Senses.	**3**	Dec 2021
3.	What is professionalism?	**4**	Dec 2021
4.	Discuss the motives of professionalism and the models for professional engineers.	**10**	Dec 2021
5.	Compare and Contrast Kohlberg's and Gilligan's Theories with real life examples.	**14**	Dec 2021
6.	What are the different types of enquiries in solving ethical problems?	**3**	Dec 2020
7.	What is moral autonomy?	**3**	Dec 2020
8.	Explain the various reasons for an employee to behave unethically in an organization.	**7**	Dec 2020
9.	What are the logical steps in solving a moral dilemma?	**7**	Dec 2020
10	Compare Gilligan's theory with Kohlberg theory on moral development.	**7**	Dec 2020
11.	Explain the term consensus and controversy in Engineering ethics.	**7**	Dec 2020
Module III			
1.	List out the models of professional roles.	**3**	Dec 2020
2.	Define plagiarism.	**3**	Dec 2020
3.	Explain the role of 'Codes of Ethics' in the service life of a professional Engineer	**7**	Dec 2020
4.	Explain the moral, conceptual, and factual issues that lead to challenger tragedy of 1986	**7**	Dec 2020
5.	Evaluate the importance of accountability in a professional's life	**7**	Dec 2020
6.	Evaluate how an Engineer can be a responsible experimenter.	**7**	Dec 2020
7.	What are the different roles and functions of "Code of ethics"?	**14**	Dec 2021
8	Explain the Bhopal gas tragedy. Discuss the violation of moral, ethics, and professional codes of standards in it	**14**	Dec 2021
9	Explain the term "Balanced outlook on law"	**3**	Dec 2021
10	Why are codes of ethics important?	**3**	Dec 2021
Module IV			

1.	What is the significance of intellectual property rights?	**3**	Dec 2020
2.	What is the difference between a bribe and a gift?	**3**	Dec 2020
3.	Explain the various justifications for confidentiality.	**7**	Dec 2020
4.	Explain how you can improve collegiality in an organisation where you are presently employed	**7**	Dec 2020
5.	Explain the significance of different types of Authority in an organisation	**7**	Dec 2020
6.	Discuss about the various rights of an engineer.	**7**	Dec 2020
7.	Discuss the methods to improve collegiality and loyalty.	**7**	Dec 2021
8.	Explain collective bargaining	**7**	Dec 2021
9.	What are occupational crimes? Give examples	**7**	Dec 2021
10	How can conflicts be managed in a workplace?	**7**	Dec 2021
11	What is confidentiality and why is it needed	**3**	Dec 2021
12	Explain collegiality and loyalty.	**3**	Dec 2021
	Module V		
1.	What is environmental ethics?	**3**	Dec 2021
2.	Justify the need of moral leadership in today's business environment?	**3**	Dec 2021
3.	Discuss in detail about the moral and ethical issues involved in the use of computers and internet with examples	**14**	Dec 2021
4.	Discuss the following in detail: a) Engineers as consultants b) Engineers as expert witnesses	**14**	Dec 2021
5.	What is business ethics?	**3**	Dec 2020
6.	Differentiate between patent and trade secret.	**3**	Dec 2020
7.	Explain human centered Environmental ethics with nature centered ethics.	**7**	Dec 2020
8.	Explain the different types of issues in computer ethics.	**7**	Dec 2020