

TUTORIAL QUESTIONS

Subject: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

S.N O	QUESTION	BLOOMS TAXONO MY LEVEL	Mapped with CO
UNIT – I			
1	Find the truth table for the propositional formula: $(p \leftrightarrow q) \leftrightarrow (q \rightarrow p)$	2	CO 1
2	What is a well formed formula? What rules of well formed formulas Explain.	3	CO 1
3	Explain in brief duality law?	2	CO 1
4	Find DNF of $\neg (P \rightarrow (q \wedge r))$	5	CO 1
5	Give the truth tables for conjunction and disjunction.	2	CO 1
6	Explain about PDNF and PCNF.	3	CO 1
7	What is mean by contradiction? Explain it with an example.	2	CO 1
8	Define tautology? Explain with an example?	3	CO 1
9	Define contradiction? Explain with an example?	3	CO 1
10	Explain the two rules of inference.	3	CO 1
11	Explain detail about logical connectives with examples?	3	CO 1
12	Find the disjunctive normal forms of the following: $(\neg p \leftrightarrow r) \wedge (q \leftrightarrow p)$	7	CO 1
13	Show that the premises $a \square (b \square c)$, $d \square (b \wedge \neg c)$, $a \wedge b$ are inconsistent	10	CO 1
14	Explain conjunctive normal form and find PCNF of $(P \square \square (Q \square \square R)) \square \square (\square \square P \square \square (\square \square Q \square \square \square R))$	7	CO 1
15	Write the following statement in symbolic form : All men are mortal. Socrates is a man. Therefore Socrates is mortal.	10	CO 1
16	Show that $R \rightarrow S$ can be derived from the premises $P \rightarrow (Q \rightarrow S)$, $\neg R \vee P$ and Q .	10	CO 1
17	Obtain PDNF of $P \rightarrow (P \rightarrow Q) \wedge \neg (\neg Q \vee \neg P)$.	7	CO 1
18	Obtain the canonical product of sums of the propositional formula: $(PAQ) \vee (\neg QAR)$.	7	CO 1
19	Using rules of inference demonstrate that R is a valid inference from the premises $P \rightarrow Q$, $Q \rightarrow R$ and P .	8	CO 1
20	Derive the following , using rule CP if necessary. $\neg PVQ, \neg QVR, R \rightarrow S \Rightarrow P \rightarrow S$	8	CO 1
UNIT – II			
1	Define equivalence relation?	4	CO 2
2	Show that the function $f(x,y) = x+y$ is primitive recursive.	7	CO 2
3	Define compatibility relation?	4	CO 2
4	Define one-one and onto functions with examples.	2	CO 2
5	Define poset.	2	CO 2
6	Define transitive closure.	3	CO 2
7	Define in degree and out degree with example.	3	CO 2
8	Define lattice and properties of lattice .	3	CO 2
9	Define distributive lattice with example.	3	CO 2
10	Explain Hasse diagram with example.	4	CO 2
11	Define Relation ? List out the Properties of Binary operations?	3	CO 2
12	Draw the Hasse diagram of $(P(S), \leq)$, where $P(S)$ is power set of the set $S = \{a,b,c\}$.	5	CO 2
13	Let the relation R be $R = \{(2,1), (3,2), (3,3)\}$ on the set $A = \{1,2,3\}$.	5	CO 2

	What is the transitive closure of R?		
14	Let $A=\{1, 2,3, 4\}$ and f and g be functions from A to A given by $f=\{(1,4), (2,1), (3,2),(4,3)\}$ and $g=\{ (1,2), (2,3), (3,4), (4,1)\}$ prove that f and g are inverse of each other.	5	CO 2
15	If $A=\{1, 2,3,4\}$, $B\{w, x, y, z\}$ and $f=\{(1,w),(2,x),(3,y),(4,z)\}$ then Prove that f is both one-to-one and onto.	5	CO 2
16	Draw the Hasse diagram of (A,\leq) , where $A= \{1,2,3,4\}$.	6	CO 2
17	Explain in brief about Inversive and Recursive functions with examples?	3	CO 2
18	Draw the Hasse diagram of $(P(S),\leq)$, where $S= \{1,2,3,4\}$.	6	CO 2
19	Let $X=\{1,2,3,4,5,6,7\}$ and $R= \{ (x, y) / x-y \text{ is divisible by } 3\}$ in X. Show that R is an equivalence Relation.?	6	CO 2
20	If $A=\{1,2,3,4\}$ and R is a relation on A defined by $R=\{(1,2),(1,3),(2,4),(3,2),(3,3),(3,4)\}$, Find R^2 and R^3 and write their digraphs.	6	CO 2
UNIT – III			
1	Explain in brief about Least common multiple with example?	3	CO 3
2	Explain in brief about GCD with example?	3	CO 3
3	Explain prime factorisation with example?	3	CO 3
4	Find the LCM and HCF of 6 and 20 by prime factorization method.	5	CO 3
5	Check whether the following are prime or not? 337, 577, 252, and 157	5	CO 3
6	Find the HCF of 96 and 404 by prime factorization method.	5	CO 3
7	Prove that for all integers a, b, c, (i) if $a \mid b$, then $a \mid bc$ (ii) if $a \mid b$, and $b \mid c$ then $a \mid c$ for all a,b,c $\in \mathbb{Z}$ integers	4	CO 3
8	Find GCD and LCM of $m=320$ and $n=512$	7	CO 3
9	Verify 287 is prime or not?	5	CO 3
10	What are the properties of binary operations?	3	CO 3
11	Explain brief about Properties of integers?	3	CO 3
12	Explain in brief about Fermats theorem?	3	CO 3
13	Explain in brief about Division theorem?	3	CO 3
14	Explain in brief about Eulers theorem?	3	CO 3
15	Explain in brief about Euclidian algorithm?	3	CO 3
16	Define abelian group with example?	3	CO 3
17	Define Congruence and discuss basic properties of congruence with proof.	3	CO 3
18	Find $d=\gcd(4977+405)$ and find the integers u and v such that $d=4977u+405v$	7	CO 3
19	Let $G=\{-1,0,1\}$. Verify that G forms an abelian group under addition?	4	CO 3
20	Define monoid,semi group,group and abelian group.	2	CO 3
UNIT – IV			
1	What is the Pigeonhole principle?	2	CO 4
2	Find the number of permutations of the EVERGREEN word?	3	CO 4
3	Find the number of permutations of the MISSISSIPPI word?	3	CO 4
4	Find the number of permutations of the NARENDRA MODI word?	3	CO 4
5	Explain multinomial theorem.	3	CO 4
6	Explain principle of inclusion and exclusion for n sets.	2	CO 4
7	. Find the number of permutations of the MATHEMATICS word?	3	CO 4
8	Define binomial theorem.	2	CO 4
9	Find the number of permutations of the JNTUK word?	3	CO 4
10	Find the number of permutations of the ENGINEERING word?	3	CO 4
11	How many positive integers not exceeding 2000 are divisible by 2,5,7	5	

	or 11.		
12	Find n if i) $P(n,2)=72$ ii) $P(n,4)=42P(n,2)$ iii) $2P(n,2)+50=P(2n,2)$	5	CO 4
13	In how many ways can four students be selected out of twelve students i) If two particular students are not included at all? ii) Two particular students included?	3	CO 4
14	. Answer the following: i) In how many ways can six men and four women sit in a row? ii) In how many ways can they sit in a row if all the men sit together? iii) In how many ways can they sit in a row if just the women sit together? iv) In how many ways can they sit in a row if men sit together?	3	CO 4
15	Consider the six digits 1, 2, 3, 5, 6, and 7. Assuming that repetitions are permitted, answer the following: i) How many ways 4 digit numbers can be formed from the six digits 1, 2, and 3,5,6,7? ii) How many of these numbers are less than 4000? iii) How many of these numbers in (i) are even? iv) How many of these numbers in (i) are odd? v) How many of these numbers in (i) are multiple of 5? vi) How many of these numbers in (i) contain both the digits 5,7?	3	CO 4
16	How many positive integers not exceeding 100 are divisible by 3,5,7.	5	CO 4
17	Show that (S, \leq) is a lattice. Where $S = \{1,2,3,4\}$. Also show that (S, \leq) is a distributive lattice.	7	CO 4
18	Show that $(S, /)$ is a lattice. Where $S = \{1,2,5,10\}$. Also show that $(S, /)$ is a distributive lattice.	7	CO 4
19	Define lattice and write their properties.	3	CO 4
20	What is the coefficient of $x^{11}y^4$ in the expansion of $(2x^3 - 3xy^2 + z^2)^6$	7	CO 4
UNIT – V			
1	Find an explicit formula for the Fibonacci numbers.	5	CO 5
2	Explain about recurrence relation?	2	CO 5
3	Find the Generating function of $n^2 - 2$?	5	CO 5
4	Find Generating function of $2(n-1)$?	5	CO 5
5	Explain about partial fractions?	4	CO 5
6	Find Generating function of 3^n ?	5	CO 5
7	Solve the recurrence relation $a_n = a_{n-1} + 2$, $a_0 = 1$ using iteration method.	5	CO 5
8	Explain about the method of Characteristics Roots?	4	CO 5
9	Solve the recurrence relation $a_n = a_{n-1}$, $a_0 = 1$ using iteration method.	5	CO 5
10	Find Generating function of a^n ?	2	CO 5
11	Solve the recurrence relation $a_n - 2a_{n-1} + a_{n-2} = 2$, $a_0 = 25$, $a_1 = 16$	7	CO 5
12	Solve the recurrence relation $a_n - 2a_{n-1} - 3a_{n-2} = 0$, $n \geq 2$ by the generating Function method $a_0 = 3$, $a_1 = 1$.	8	CO 5
13	Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 6 + 8n$, $a_0 = 1$, $a_1 = 2$.	7	CO 5
14	Solve the recurrence relation $a_n = a_{n-1} + n$, $a_0 = 1$ using iteration method.	8	CO 5
15	What is a Generating function and explain the operations on generating functions?	7	CO 5
16	Solve the recurrence relation of the sequence of numbers $f_n = f_{n-1} + f_{n-2}$, $n \geq 2$ With the initial condition $f_0 = 1, f_1 = 1$.	7	CO 5
17	Solve the recurrence relation $a_n = 4a_{n-1} - 4a_{n-2} + 4^n$, $a_0 = 2$, $a_1 = 8$ using G.F.	7	CO 5

18	Solve the recurrence relation $a_n = 4a_{n-1} - 4a_{n-2} + 3n + 2^n$, $a_0 = 1$, $a_1 = 1$	7	CO 5
19	Solve the recurrence relation $a_n = 4a_{n-1} - 4a_{n-2} + (n+1)2^n$.	7	CO 5
20	Solve $a_{n+2} - 4a_n = 9n^2$	7	CO 5
UNIT – VI			
1	What is walk ,trail, path and circuit? Explain with an example.	2	CO 6
2	Define bipartite graph ?	3	CO 6
3	Define Euler graph and Hamilton graph Explain with an example .	3	CO 6
4	Define and explain planar graphs Explain with examples .	3	CO 6
5	Define and explain chromatic number.	3	CO 6
6	Explain isomorphic graphs?	4	CO 6
7	Define and explain minimal spanning tree.	2	CO 6
8	How many vertices will the graph contain 6 edges and all vertices of degree 3?	5	CO 6
9	Define adjacency and incident matrices?	4	CO 6
10	Define coloring of agraph?	2	CO 6
11	Write conditions of chromatic number.	3	CO 6
12	Define chromatic number and find chromatic number of w_5 .	5	CO 6
13	Show that $k_{3,3}$ is non-planar.	5	CO 6
14	Explain BFS.	7	CO 6
15	Explain Kruskals algorithm with an example.	7	CO 6
16	Explain Prims algorithm with an example.	7	CO 6
17	A complete binary tree has 25 leaves .How many vertices does it have?	8	CO 6
18	Show that the number of vertices of odd degree is even.	3	CO 6
19	Show that if the number of vertices of a connected graph is n and the number of edges m and the region then $r+n-m=2$.	3	CO 6
20	Explain DFS.	7	CO 6

TUTORIAL QUESTIONS

Subject: Data Structures through C++

S.N O	QUESTION	BLOOMS TAXONOMY LEVEL	Mappe d with CO
UNIT – I			
1	Explain sparse matrix representation using array with an example. Discuss the advantage and disadvantages of this method.	4	CO1
2	Discuss matrix multiplication with an example.	2	CO1
3	Define polynomial ADT	2	CO1
4	Define data structure. Discuss different types of data structure their implementations applications.	5	CO1
5	What is an array? Discuss different types of array with examples.	6	CO1
6	Explain how to implement polynomial ADT using array. Discuss its Advantages and Disadvantages.	5	CO1
7	Explain polynomial addition using arrays.	6	CO1
UNIT – II			
1	Write an algorithm to insert and delete a key from circular queue.	6	CO2
2	Explain the procedure to convert infix expression to postfix expression with the following expression: $((A - (B+C) * D) / (E+F))$	4	CO2
3	List the application of stacks.	1	CO2
4	Define queue full condition.	1	CO2
5	Write an algorithm for basic operations of stack.	3	CO2
6	Explain the procedure to evaluate postfix expression. Evaluate the following postfix expression $7\ 3\ 4\ +\ -\ 2\ 4\ 5\ /\ +\ * \ 6\ /\ +\ ?$	4	CO2
8	Explain the operations performed on simple queue with an example.	6	CO2
9	Convert following expression $X + (Y * Z) - ((N * M + O) / P)$ in to post form.	5	CO2
UNIT – III			
1	List various operations of linked list and explain how to insert a node anywhere in the list.	6	CO3
2	Show how to reverse a single linked list.	7	CO3
3	Write recursive algorithm for lists.	5	CO3
4	Explain the procedure to insert and delete element from sparse matrix.	4	CO3
5	Write an algorithm to push and pop an element from linked stack	6	CO3
6	Discuss sparse matrix representation using linked list.	4	CO3
7	What is the degree of a graph?	2	CO3
UNIT – IV			
1	List the different tree traversals	2	CO4
2	Define spanning tree.	2	CO4
3	Explain binary tree ADT.	4	CO4
4	Discuss representation of binary tree using arrays and linked list.	8	CO4
5	Define binary search tree. Show how to insert and delete an element from binary search tree.	7	CO4

6	Write algorithm to insert and delete an element from binary search tree.	6	CO4
7	Construct max heap for the following: 140, 80 , 30 , 20 ,10 ,40 ,30 ,60 ,100 ,70 ,160 ,50 , 130, 110, 120	5	CO4
UNIT – V			
1	Define in-degree and out-degree of a graph..	2	CO5
2	Explain Warshall's algorithm to find transitive closure of a graph with a suitable example.	7	CO5
3	Write Prim's algorithm.	4	CO5
4	What is a graph? Explain the properties of graphs.	6	CO5
5	Write breadth first traversal algorithm. Explain with an example.	6	CO5
6	What are connected components of graph? Is there a method to find out all the connected components of graph? Explain.	4	CO5
7	Explain Prim's algorithm with an example.	6	CO5
8	What is planer graph?	1	
UNIT – VI			
1	What is the best sorting technique? Why?	2	CO6
2	State and explain insertion sort with example.	8	CO6
3	Differentiate between iterative merge sort and recursive merge sort.	7	CO6
4	Rearrange following numbers using quick sort: 10, 6, 3, 7, 17, 26, 56, 32, 72	6	CO6
5	Write a program to sort the elements using radix sort.	7	CO6
6	Write algorithm for merge sort.	6	CO6
7	Discuss how to sort elements using merge sort with suitable example.	5	CO6
8	Time complexity of quick sort	2	CO6

TUTORIAL QUESTIONS

Subject: Digital Logic Design

Unit No.	Sl.No.	Questions	Bloom's Taxonomy level	Mapped with CO
I	1.	Convert (i) $(615.25)_8$ to $(?)_{10}$, $(?)_2$ & $(?)_{16}$. (ii) $(12.125)_{10}$ to $(?)_8$, $(?)_2$ & $(?)_{16}$. (iii) $(1101.111)_2$ to $(?)_{10}$, $(?)_8$ & $(?)_{16}$. (iv) $(6A5.B5)_{16}$ to $(?)_{10}$, $(?)_2$ & $(?)_8$.	3	CO 1
	2.	Solutions of quadratic equation $x^2 - 11x + 22 = 0$ are $x = 3$ & $x = 6$ $x = 3$ & $x = 6$ Identify the base of the system.	2	CO 1
	3.	Convert -45, +45, -65 & +65 in (i) sign magnitude form (ii) sign 1's complement form (iii) sign 2's complement form.	4	CO 1
	4.	Perform addition using Add and Subtract in BINARY (i) 1111 & 1010 (ii) 100100 & 10110	8	CO 1
	5.	Perform $28_{10} - (15)_{10}$ using 6-bit 2's complement subtraction.	5	CO 1
	6.	Perform (i) 5250-321 (ii) 3570-2100 (iii) 20-100 using 9's complement subtraction and 10's complement subtraction.	6	CO 1
	7.	Perform (i) $3250_{10} - 72532_{10}$ (ii) $72532_{10} - 3250_{10}$ using 10's complement subtraction and what did you infer from results.	7	CO 1
	8.	Perform arithmetic operations indicated below and verify answers if left most position is sign bit and negative numbers are in 2's complement form (i) $101011 + 111000$ (ii) $111001 - 001010$	9	CO 1
	9.	Perform (i) $3250_8 - 72532_8$ (ii) $72532_{10} - 3250_{10}$ using 7's complement subtraction and 16's complement subtraction. what did you infer from results.	7	CO 1
	10.	Perform (i) $3250_8 - 72532_8$ (ii) $72532_{10} - 3250_{10}$ using 1's complement subtraction and 10's complement subtraction.	10	CO 1
	11.	Convert to 2's complement form and 2's complement form of subtraction with example.	1	CO 1
	12.	Convert to 2's complement form and solve $3250_{10} - 72532_{10}$.	8	CO 1
II		State basic Boolean theorems and properties and give proofs of each property and theorem.	2	CO 2
	2.	Prove that AND-OR network is equivalent to (i) NAND-NAND network and (ii) NOR-NOR network.	8	CO 2
	3.	Why universal gates? Why are they called so?	7	CO 2
	4.	Implement XOR & XNOR using Universal gates.	4	CO 2
	5.	Convert the following equations into standard sop $B, C, D = A'B + BC + CD' + ACD$ $B, C, D = (A+B'+C)(A+D)(B'+C')(A+B+C)$	5	CO 2
	6.	Convert the following equations into canonical pos	6	CO 2

		$B, C, D = A'B + BC + CD' + ACD$ $B, C, D = (A + B' + C)(A + D)(B' + C')(A + B + C)$		
	7.	Represent the following functions using (i) NAND gates (ii) NOR gates $F_1 = A(B + CD) + (BC)$ $F_2 = WX' + X'Y(Z + W')$	3	CO 2
	8.	Conclude $((AB)' + A' + AB)' = 0$	8	CO 2
	9.	Reduce the following Boolean expressions $AB'(C + BD) + A'B'A'B'C + (A + B + C')' + A'B'C'D$	9	CO 2
	10.	Write the complement of the following Boolean expressions $X'YZ + XZ$ $XY + X(WZ + WZ')$	10	CO 2
	11.	State the Demorgan's theorems and simplify the expression. $((((AB)' + ABC)' + A(B + AB'))')$	1	CO 2
	12.	Reduce $\{(CD)' + A\}' + A + CD + AB$.	7	CO 2
III		Apply K-MAP (i) $f(a, b, c, d) = \sum(0, 2, 3, 6, 7) + d(8, 10, 11, 15)$ (ii) $f(w, x, y, z) = \pi(4, 5, 6, 7, 8, 12) \phi(1, 2, 3, 9, 11, 14)$	5	CO 3
	2.	Apply K-MAP and implement using NAND gates (i) $f(a, b, c, d) = \sum(1, 2, 4, 6, 7, 8, 11, 12, 13)$ to POS form. (ii) $f(w, x, y, z) = \pi(1, 3, 7, 11, 15) \phi(0, 2, 5)$ to SOP form.	6	CO 3
	3.	Analyze $Y = \sum m(3, 6, 7, 8, 10, 12, 14, 17, 19, 20, 21, 24, 25, 27, 28)$ using K-Map method.	7	CO 3
	4.	Write minimal SOP and minimal POS expressions for the following function $F(A, B, C, D) = \sum m(0, 1, 1, 5, 8, 9, 10)$.	9	CO 3
	5.	Solve the following Boolean expression using X-NOR and NOR gates $F = AB'CD' + A'BCD' + AB'C'D + A'BC'D$.	10	CO 3
	6.	Consider K-MAP and simplify $f(a, b, c, d) = \sum(0, 1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14)$ $f(a, b, c) = \pi(0, 2, 4, 6)$	8	CO 3
	7.	Modify using K-MAP and implement using AOI logic $f(a, b, c, d) = \sum(1, 2, 4, 6, 7, 8, 11, 12, 13)$ to POS form. $f(w, x, y, z) = \pi(1, 3, 7, 11, 15) \phi(0, 2, 5)$ to SOP form	3	CO 3
	8.	Represent the following Boolean expression using X-OR and OR gates $F = AB'CD' + A'BCD' + AB'C'D + A'BC'D$.	4	CO 3
	9.	Reproduce $Y = \sum(0, 1, 4, 5, 16, 17, 21, 25, 29)$ using K-Map method.	1	CO 3
	10.	Consider K-MAP simplification and implement using AOI logic $f(a, b, c, d) = \sum(1, 2, 4, 12, 13) + d(5, 6, 7)$ to POS form. $f(w, x, y, z) = \pi(1, 3, 9, 11, 15) \phi(0, 2, 5)$ to SOP form	8	CO 3
IV	1.	Design (i) HALF ADDER (ii) HALF SUBTRACTOR	9	CO 4

		(iii) FULL ADDER (iv) FULL SUBTRACTOR		
	2.	Explain 4 bit ripple adder/subtractor with suitable example.	7	CO 4
	3.	Design (i) 4bit magnitude comparator (ii) 5bit magnitude comparator	10	CO 4
	4.	Summarize the following code converters (i) GRAY-BINARY (ii) BINARY-BCD (iii) BCD-XS3 (iv) XS3-BINARY (v) INARY-GRAY	8	CO 4
	5.	Design (i) octal to binary encoder (ii) 4 bit priority encoder	9	CO 4
	6.	Reproduce HALF SUBTRACTOR and FULL ADDER using (i) MUX (ii) DEMUX (iii) DECODER	2	CO 4
	7.	Apply decoder and external gates for following (i) $F_1 = X'Y'Z' + XZ$ $F_2 = XY'Z' + X'Y$ $F_3 = X'Y'Z' + XY$ (ii) $F_1 = \sum(0,1,3,6,7)$ $F_2 = \sum(0,2,4,7)$	5	CO 4
	8.	Represent following using LOGIC GATE (i) 3 to 8 decoder (ii) 4 to 16 mux (iii) 1x16 demux	4	CO 4
	9.	Analyze following using (i) 4 input mux (ii) 8x1 mux (iii) 3 to 8 decoder (iv) 2 to 4 decoder $F_1 = \sum(0,1,3,6,7)$	7	CO 4
	10.	Apply (i) 4 input mux (ii) 8x1 mux (iii) 16x1 mux for following $F_1 = \sum(0,1,3,4,8,9,15)$	6	CO 4
	11.	Convert 4 to 16 decoder into demux	3	CO 4
V		Explain the operation of (a) SR latch using NOR gates (b) Gated D latch using NAND gates	7	CO5
	2.	Explain the operation of negative edge triggered D flip-flop when CP=1.	7	CO5
	3.	What is RACE AROUND condition? How can we eliminate it? Explain MASTER SLAVE JK flip-flop and state its advantages.	2	CO5
	4.	Explain the operation of positive edge triggered JK flip-flop in detail.	3	CO5
	5.	Distinguish combinational & sequential logic circuits?	8	CO5
	6.	List different methods used to trigger a flip-flop?	6	CO5
	7.	What is a flip-flop? Design basic flip-flop circuit with NAND gates.	1	CO5
	8.	Draw EXCITATION tables and TRUTH tables of (a) D (b) T (c) JK (d) SR flip-flops.	10	CO5

	9.	Write characteristic equations of (a) D (b) T (c) JK (d) SR flip-flops.	5	CO5
	10.	Define the following terms with respect to flip-flops (a) Setup time (b) Hold time (c) Propagation delay (d) Preset (e) Clear (f) Latch	8	CO5
	11.	Convert the following flip-flops (a) JK to D (b) T to D (c) D to SR (d) SR to JK (e) T to SR	4	CO5
VI		Distinguish Asynchronous & Synchronous sequential logic circuits?	8	CO6
	2.	Draw timing diagram explain operation of (a) 3 bit universal shift register. (b) 4 bit controlled buffer register.	7	CO6
	3.	Design Johnson's counter using a 2 bit shift register. Draw waveforms and list applications of shift register.	5	CO6
	4.	Explain about parallel in serial out shift register. How to load data word ABCD=1101 in the 4 bit bidirectional shift register in shift left mode.	2	CO6
	5.	Design a register for left & right shift of data for 10110101.	9	CO6
	6.	Explain about ring counter and twisted ring counter. Draw and explain about 4 bit ring counter.	8	CO6
	7.	Explain about synchronous ripple counter and compare merits and demerits.	3	CO6
	8.	Explain about 4 bit ripple down counter using positive edge triggered flip-flop.	4	CO6
	9.	Design ripple counter. Design BCD ripple counter.	1	CO6
	10.	Explain about working of 4 bit asynchronous counter.	7	CO6
	11.	Design (a) mod-12 synchronous up counter using 'T' flip-flop. (b) mod-10 synchronous down counter using 'JK' flip-flop. (c) mod-6 synchronous up counter using 'D' flip-flop. (d) mod-6 synchronous down counter using 'SR' flip-flop.	10	CO6
	12.	A counter has 14 stable states 0000 to 1101. If input frequency is 50KHz Compute its output frequency?	6	CO6

TUTORIAL QUESTIONS

Subject: Computer Graphics

	UNIT – I	Blooms taxonomy	Mapping with outcome
1	Explain the Bresenham’s line drawing algorithm	4	CO2
2	Explain the midpoint circle drawing algorithm. Assume 10cm as the radius and co-ordinate origin as the center of the circle	4	
3	Explain (a) random and raster scan devices (b) primitives used for filling	3	
4	Explain about filled area primitives	3	
5	Explain D viewing pipeline in detail	3	
6	Explain Cohen-Sutherland’s line clipping algorithm.	4	
7	Derive the viewing Transformation matrix in detail	6	
8	Explain polygon clipping algorithm	3	
9	Explain the different 2D transformations	4	
10	Explain the about the lines of attribute primitives?	3	
UNIT – II			
1	Explain about parallel and perspective projection in detail?	9	CO2
2	Discuss the concept of three dimensional object representations?	8	
3	Explain curved line and splines	9	
4	Explain about quadric surface in detail?	9	
5	Discuss about the concept of Visualization of data sets?	7	
6	Explain about 3D Transformation in detail?	3	
7	Explain the concept of 3D viewing in detail?	4	
8	What are the methods of visible surface detection?	2	
9	What is back face detection ?give one example	1	
10	Write the concept of painter’s method?	1	
UNIT – III			
1	What is the importance of graphics programming?	2	CO3
2	Write short note on the following color models: I. RGB II. YIQ III. CMY IV. HSV	2	
3	What is computer animation? give one example	1	
4	Explain about general computer animation techniques?	3	
5	Discuss about raster animation in detail?	9	
6	Discuss about key frame systems?	4	
7	What are basic graphics primitives?	2	
8	Write the concept of drawing three dimensional objects?	2	
9	Write the concept of drawing three dimensional scenes?	2	
10	What is animation sequence?	2	
UNIT – IV			
1	What is rendering? give one example	1	
2	What is shading ?give one example	1	
3	Explain the concept of shading models?	4	
4	Discuss the concept of flat and smooth shading?	7	
5	Write the concept of adding textures to faces?	2	

6	Write the concept of adding shadows of objects?	9	CO4
7	Discuss about the concept of building a camera in a program?	9	
8	Explain the concept of creating shaded objects?	3	
9	Discuss about rendering textures?	3	
10	Discuss about drawing shadows?	2	
UNIT – V			
1	Discuss about the concept of Fractals and self similarity?	3	CO5
2	Explain about the concept of peano curves?	9	
3	What is creating image by iterated functions?	2	
4	What are Mandelbrot sets? Give example?	4	
5	Explain about Julia sets? Give example?	3	
6	Explain about Random Fractals? Give example?	4	
UNIT – VI			
1	What is meant by intersecting rays?	2	CO6
2	Give the relationship between intersecting rays and primitives?	2	
3	Write the concept of adding surface textures?	9	
4	What is reflection and transference?	2	
5	Write the concept of Boolean operation on objects?	2	