S6 CSE QUESTION BANK
COMPUTER SCIENCE & ENGINEERING

Index

CST 302 COMPILER DESIGN
MODULE 1

1.	What is the relevance of input buffering in lexical analysis?	3	JUNE 23
2.	Construct a regular expression for the language that consists of all strings ending with 00 over $\Sigma = \{0,1\}$.	3	MAY 23
3.	Write short notes on compiler construction tools.	6	JUNE 23
4.	What are the various phases of a compiler? Explain each phase in detail by using the input statement. position := initial + rate * 60	8	JUNE 23
5.	List and explain any three tools that help a programmer in building a compiler efficiently.	6	MAY 23
6.	Apply bootstrapping to develop a compiler for a new high level language N on machine P.	5	MAY 23
7.	Define the terms tokens, lexemes and patterns with examples	6	JUNE 23
8.	Explain the role of transition diagrams in recognition of tokens. Draw the transition diagram for the regular definition: relop → < | <= | = | <> | >= | >	8	MAY 23
9.	Explain the importance of sentinels in input buffering used in lexical analysis	3	JUNE 22
10.	Find the lexemes in the following programming statement. sum = a * (b -10) ; Define tokens and patterns for the above statement.	4	JUNE 22
11.	Explain in detail about buffer pairs and sentinels.	8	JUNE 23
12.	Explain the role of transition diagrams in recognition of tokens.	7	JUNE 22

MODULE 2

1	Find the FIRST and FOLLOW of the following grammar S->aABe A->Abc/b B->d	5	KTU Model
2	Given a grammar : S → (L)| a L → L,S | S (i) Is the grammar ambiguous? Justify. (ii)Build a parse tree for the string (a,((a,a), (a,a))).	3	JUNE 23
3	Consider the following grammar: E→ E + T | T T→ T * F |F F→ ~ F | (E) | id a.Remove left recursion from the grammar b.Construct a predictive parsing table. c.Justify the statement " The grammar is LL (1)".	9	MAY 23
4	Design a recursive descent parser for the grammar S->cAd, A->ab/b	5	MAY 23
5	Left factor the following grammar and then obtain LL(1) parsing table. S → TL; T → int | float L → L , id | id Is the grammar LL(1)? Justify your answer.	3	MAY 23
6	a) Show that the grammar S -> iCtSeS | iCtS | b , C -> a is ambiguous. b) Eliminate ambiguity from the above grammar.	5	JUNE 22
7	Write all the moves by the LL(1) parser for parsing the input "int id,id;". [Use the parsing table created in question number	7	MAY 23
8	What are the different parsing conflicts in the SLR parsing table?	3	KTU JUNE 22
9	Compute the FIRST and FOLLOW for the following Grammar. S → SS | AB A → Aa | a B → Bb | b	3	MAY 23
10	Define an operator grammar. Give an example.	3	MAY 23
11	With an example write the steps to remove left recursion.	3	JUNE 23

MODULE 3

1.	Construct canonical LR(0) collection of items for the grammar below. S → L = R S → R L → * R L → id R→ L Also identify a shift reduce conflict in the LR(0) collection constructed above.	10	May 23
2.	Write an algorithm for computing the closure of an LR(0) items.	4	May 23
3.	Construct LALR parse table for the grammar: A→ BB, B→ bB | d		May 23
4.	What are different parsing conflicts in SLR parsing table?	4	May 23
5	Construct canonical LR(0) collection of items for the grammar below. S → L = R | R L → * R | id R → L Prove that this grammar is not SLR(1).	9	KTU JUNE22
6	What are L-attributed definitions and S-attributed definitions in a syntax directed translation scheme?	3	JUNE 23
7	What are viable prefixes?	7	MAY 23
8	Convert the expression a = b * -c + b * -c into quadruple?	5	KTU JUNE22
9	Construct LALR parse table for the grammar: A→ BB, B→ bB | d	3	KTU JUNE22
10.	What is a shift-reduce parser? Explain in detail the conflicts that may occur during shift-reduce parsing.	8	MAY 23
11.	Consider the grammar S → Aa | bAc | dc | bda A → d Construct a LALR parsing table for the grammar given above. Verify whether the input string “bdc” is accepted by the grammar or not	14	MAY 23

MODULE 4

1.	Write the SDD for a desk calculator and draw the annotated parse tree for the expression: 4 * 5 + 6 - (3 * 2)	8	JUNE 23
2	Explain bottom- up evaluation of s-attributed definitions	6	JUNE 23
3	Write syntax directed definition to construct syntax tree and three address code for assignment statements.	7	JUNE 23
4.	Explain static allocation and heap allocation strategies	7	JUNE 23
5	Generate an intermediate code for the following code segment along with the required syntax-directed translation scheme. if (a > b) x = a + b else x = a – b where a and x are of real and b of int type data	7	MAY 23
6	Construct the DAG and three address code for the expression a+a*(b-c)+b*(b-c)+b	7	KTU JUNE22
7.	Explain different stack allocation strategies with suitable example	10	JUNE 2021
8	What is the role of activation record in compiler design?	3	KTU JUNE22

MODULE 5

1.	Explain different code optimization techniques.	10	MAY 23
2.	How is storage organization and management done during run-time?	4	Dec19
3.	Design a type checker for simple arithmetic operations	3	May19
4.	How the optimization of basic blocks is done by a compiler?	6	Dec19 KTU 2021
5.	Write the Code Generation Algorithm	3	May19
6	Generate target code sequence for the following statement d=(a-b)+(a-c)+(a-c)	9	KTU Model

7	Describe the Principal Sources of Optimization.	7	KTU Model
8	With suitable example of a basic block, explain the code-improving transformations of a basic block.	7	KTU JUNE22
9	Discuss the code optimization techniques available in local optimization?	5	KTU Model
10	With suitable examples explain loop optimization techniques With suitable example of a basic block, explain the code-improving transformations of a basic block.	7	KTU Model
11	Explain issues in design of a code generator	6	KTU JUNE22
12	Write the code generation algorithm. Using this algorithm generate code sequence for the expression x = (a – b) + (a + c) + (a + c)	7	KTU JUNE22

CST 304 COMPUTER GRAPHICS & IMAGE PROCESSING

MODULE 1			
Sl. No	**Questions**	**Marks**	**KTU/Year**
1	Differentiate the aspect ratio and resolution of a raster scan display	4	JUNE 2023, Dec' 18 Aug' 21,
2	Explain the architecture of raster graphics system with suitable diagrams. / Describe simple raster scan system and draw its architecture.	6 / 4	JUNE 2023, May 2019 Dec 20
3	Explain the working of a random scan display system with suitable diagram. Differentiate between raster scan and random scan display systems.	6	Dec 2018, June 2022
4	1, Explain the working of a beam penetration CRT. 2. Explain the components and working of colour CRT with suitable diagrams. 3. With a suitable figure, describe the shadow masking techniques in CRT. / With a suitable diagram, explain the working of a shadow mask CRT display	3	DEC 2018,JUNE 2023
5	Scan convert the line segment with end points (30, 20) and (15, 10) using DDA line drawing algorithm .	4	Dec' 19 Sep 2020, June 2022,June 2023
6	Rasterize the line segment from pixel coordinate (1, 1) to (8, 5) using Bresenham's line drawing algorithm	8	June 2023
7	What is the purpose of a frame buffer in a display system?	3	Dec'19

8	1. Generate the points between the end points of a line viz (2, 2) and (9, 6) by using Bresenham's line drawing algorithm. 2. Convert the line segment with end points (0,0) and (10,5) using DDA line drawing algorithm. 3. Indicate what raster locations would be chosen by Bresenham's algorithm while scan converting a line from (5, 5) to (13, 9). 4. Digitize a line with end points (35, 40) and (43, 45) using Bresenham's algorithm	5	June 2023 Sep' 20, June 2022, May 19
9	1. Generate 4 pixel positions of a circle in the first quadrant with radius r=10 centered on the origin, using the midpoint circle algorithm. 2. Use midpoint circle drawing algorithm to plot a circle whose radius =20 units and center is (50, 30).	4	Dec' 20, June 2022
10	Write a note on any two interactive graphics input devices.	3	Dec'19 Sep'20 Dec' 20
11	How many bits are required for 1024×1024 raster with each pixel being represented by 24 bits ?	3	June 2022

SL.No	**MODULE 2**		
1	Write the flood fill algorithm for filling a polygon.	4	Dec 2018,june 2023
2	Compare Boundary and flood fill algorithm.	4	Dec 20,June 2023

3	1. Write the boundary fill algorithm for filling a polygon using eight connected approaches. 2. Explain the boundary fill algorithm using 4-connected approach.	4	Dec'19, June 2022, May 2019
4	Write the scan line algorithm for filling a polygon. / Explain with illustration the scan line algorithm to fill the interior of a polygon.	4/5	Dec'18 Aug '21, June 2022
5	1.Consider a triangle at (2,2), (10,2), (2,10). Perform the following 2D transformations in succession and find the resultant vertices (i) Scale with respect to (2,2) by scaling factors (2,2) respectively along x and y directions. (ii) Rotate by 90^0counter clockwise direction 2.Given a triangle A(20,10) B(80,20) C(50,70). Find the co-ordinates of vertices when (a) Reflection about the line x=y, (b) Reflection about the diagonal y = -x. 3. Perform a 45-degree rotation of a triangle ABC having the vertices at A (0,0) B (10,10) and C (50,20) i. About the origin ii About an arbitrary point P (-10, -10) 4. Describe the transformation which reflects a 2-D object about a line L which has a y- intercept (0, b) and an angle of intersection theta degree w.r.t. to the x axis. 5. Show that transformation matrix for a reflection about the line y=x is equivalent to a reflection relative to the x axis followed by a counter clockwise rotation of 90 degrees. 6. a) Perform the following transformations on a point (6, 4) i) Translate by tx = −2 and ty = 4	4	June 2023 Dec 2018, Dec2019

	ii) then, Scale by sx = 2 and sy = 1 and Rotate by 90o in clockwise direction. Determine the final coordinates of the transformed point.		
6	Show that the composition of two rotation is additive by concatenating the matrix representation for R(Θ1) and R(Θ2)	4	Dec 2019

7	Write down the 4- neighbour Flood-filling algorithm (3)	4	June 2023
8	Describe the relevance and various methods of inside-outside test used in polygon filling.	3	Sep' 20,June 2023
9	Explain the non-zero winding number rule to identify interior regions of a polygon.	3	May' 19, DEC 20, June 2022
MODULE 3			
1	Given a clipping window A (-20, -20), B (40, -20), C (40, 30) and D (- 20, 30). Using Cohen Sutherland line clipping algorithm, find the visible portion of the line segment joining the points P (-30, 20) and Q(60,-10).	6	Dec 2018
2	Derive an equation for window to viewport transformation by specifying the sequence of basic transformations involved.	3	June 2023,dec 2018
4	Explain the window to viewport coordinate transformation and also derive the scaling factors during the transformation.	5	Dec 2019, June 2022,June 2023

5	Define the terms window, viewport and windowing transformation in the context of 2D viewing with suitable diagrams.	4	May2019
6	Explain the concept of point clipping in 2D.	2	May2019

7	Explain the Cohen Sutherland line clipping algorithm with suitable Examples	6 /8	May 2019, June 2022,June 2023
8	Which are the steps involved in window to viewport coordinate transformation in 2D?	4	Sep2020
9	Summarize on multi view and axonometric projections. Write the equation for projection coordinates of a point P (x, y,z), if the view plane is placed along z axis.	4	June 2023
10	Let ABCD be a rectangular window with A (20, 20), B (90, 20), C (90, 70), D (20,70). Find the region codes for the end points and use Cohen – Sutherland algorithm to clip the line with end points P1(10,30), and P2(80,90).	5	Aug 21
11	Explain Sutherland Hodgeman polygon clipping algorithm with illustrations. / Explain the Sutherland Hodgeman algorithm for polygon clipping with an example.	5/9	Dec'18 Sep'20, June 2022
12	Explain the Depth Buffer method for visible surface detection	6	June 2022,June 2023

MODULE 4			
1	Explain any three applications of digital image processing	6	June 2022,June 2023
2	Define 4-adjacency, 8-adjacency and m-adjacency. Explain using an example for each.	8	June 2022
3	Explain the process of convolution with an example.	8	June 2022,June 2023
4	Explain the fundamental steps in Digital Image Processing with a neat diagram? / Explain the components of a general purpose digital image processing system with a neat diagram.	6	June 2023, June 2022, Dec' 18 May' 19 Aug' 21, June 22
5	Write short notes on (i) Illumination, (ii) Reflectance	6	June 2023
6	Describe the basic concepts of sampling and quantization with a neat sketch.	4	Sep' 20, June 2022
7	What do you mean by histogram of a digital image? Discuss on the histogram of four basic image types.	4	May' 19, June 2022
8	Explain histogram matching with an example.	8	Sep' 20

9	What is edge detection? Explain any one edge detection technique in digital image processing.	4	Dec' 19 Aug' 21
10	How edge detection is performed in digital images using (i) Sobel operator (ii) Prewitt operator. What are the advantages of Sobel operator over Prewitt operator? / Explain the Robert's, Prewitt's and Sobel's edge detectors.	6	May' 19 Aug' 21 Dec' 18 Dec' 20

25

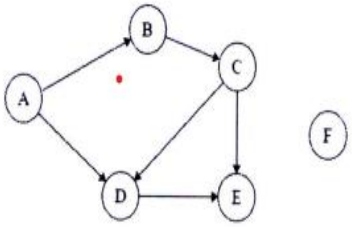
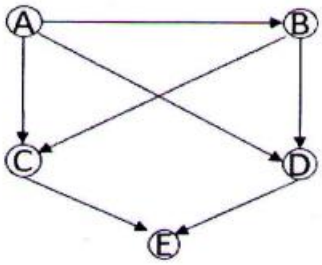
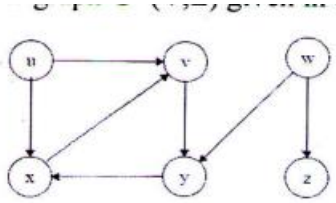
	MODULE 5		
1	What do you understand by correlation and convolution operations in case of image processing?	4	Dec' 18 Aug' 21
2	Describe the concept of spatial convolution.	4	Dec' 20, June 2022
3	A 3-bit image of size 4×5 is shown below. Compute the histogram equalized image. 0 1 1 3 4 7 2 5 5 7 6 3 2 1 1 1 4 4 2 1	4	June 2023
4	Define the following terms related to pixel of an image: i) pixel neighbour ii) digital path iii) connected set iv)boundary	4	May' 19,June 2023
5	Describe Histogram and also the type of information which obtained from a gray level histogram.	4	Dec' 19

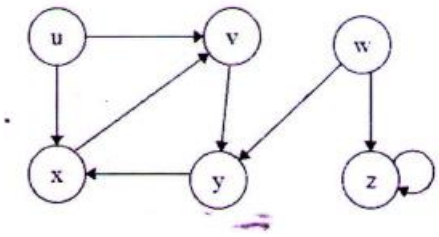
6	Discuss the role of histogram equalization in a digital image. / Describe histogram equalization and discuss the role of histogram equalization in a digital image.	2 / 4	May'19 Aug' 21 Dec' 20
7	Consider the image segment shown below. 3 1 2 **1 (q)** 2 2 0 2 1 2 1 1 **(p)1** 0 1 2 i) Compute the lengths of shortest 4, shortest 8 and shortest m paths between pixels p and q where V= {0, 1}. If a particular path does not exist between these two points, explain why.	6	Dec' 19
8	Consider the image segment and compute the length of the shortest 4-,8- and m-path between p and q by considering two set of values for V	8	Sep' 20

	(i) V= {0,1,2} (ii) V= {1,2} If a particular path does not exist explain the reason for the above two cases of V. 3 4 1 2 0 0 1 0 4 2(q) 2 2 3 1 4 (q)3 0 4 2 1 1 2 0 3 4		

<table>
<tr><td>9</td><td>Consider the image segment shown below
0 1 2 1 (y)
1 2 0 2
1 2 1 1
(x) 1 0 1 2
Compute the lengths of shortest 4-path, shortest 8-path and shortest m path between pixels x & y, where V= {0, 1}. Explain why no particular path exists between these two points, if there is no path.</td><td>6</td><td>Aug’ 21</td></tr>
<tr><td>10</td><td>Write the algorithm for basic Global thresholding</td><td>4</td><td>June 2023</td></tr>
<tr><td>11</td><td>Explain the following grey level transformation functions. i) Image negatives ii) Gamma Transformation</td><td>6</td><td>June 2022</td></tr>
<tr><td>12</td><td>What is histogram equalization? Also, apply the histogram equalization method on the following 3-bit image
<table><tr><td>3</td><td>2</td><td>1</td><td>1</td></tr><tr><td>4</td><td>4</td><td>5</td><td>5</td></tr><tr><td>5</td><td>5</td><td>6</td><td>7</td></tr><tr><td>1</td><td>2</td><td>6</td><td>7</td></tr></table></td><td>8</td><td>June 2022</td></tr>
</table>

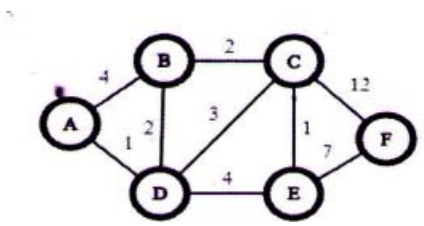
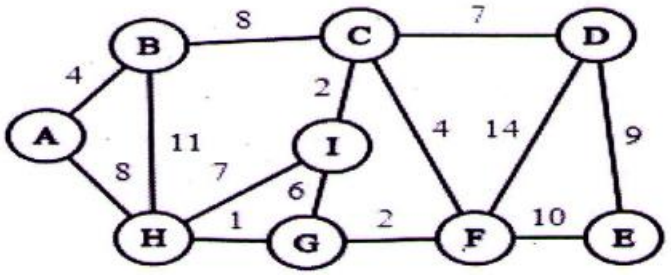
CST 306 ALGORITHM ANALYSIS AND DESIGN			
MODULE 1			
Sl.No.	**Questions**	**Marks**	**KTU, Year**
1	Show that for any real constants a and b, where b > 0, (n + a) b=O(n b)	3	KTU-June,2023
2	Solve the following recurrence equations using Master theorem. a. T(n) = 3T(n/2) + n2 b. T(n) = 2T(n/2) + n log n	3	KTU-June,2023
3	Let f (n) = 7n + 4. Prove that this is of the order of Ω(n).	2	KTU-May,2023
4	Solve the following recurrence using Master theorem. a) T(n) = 8T $(\frac{n}{2}) + n^2$ b) T(n)= 2t($\frac{n}{2}$)+ n	3	KTU-May,2023
5	Let f (n) :$3n^3 + 2n^2 + 3$ + 2nz + 3 for an algorithm, Let g(n) = n^3. prove that f(n) of this algorithm is in O(n^3)	4	KTU-May,2022
6	Solve the recurrence T(n) = 3T ($\frac{n}{4}$)+ nlogn		KTU-May,2022
7	Illustrate best case, average case and worst-case complexity with insertion sort algorithm.	9	KTU JUNE ,2022
8	Give the general idea of the substitution method for solving recurrences. Solve the following recurrence using substitution method. T(n)=2T($\frac{n}{2} + n$) a) T(n) = T($\frac{n}{n3}$) + $T\left(\frac{2n}{3}\right) + cn$ b) T(n) = 2T($\frac{n}{2}$) + n	8	KTU JUNE ,2022
9	Define Big Oh, Big Omega and Theta notations and illustrate them graphically.	6	KTU JUNE ,2022
MODULE 2			
Sl.No.	**Questions**	**Marks**	**KTU, Year**
1	Discuss briefly the heuristics, union by rank and path compression, to improve the running time of disjoint set data structure.	3	KTU-June,2023
2	Find any ONE topological ordering of the following the graph.	3	KTU-May,2023

			
3	Define MAKE_SET(x), UNION(x,y) and FIND_SET(x) operations of disjoint set data structure with a suitable example.	2	KTU-May,2023
4	Define AVL tree. Explain the rotations performed for insertion in AVL tree.	3	KTU-June,2023
5	Find the different topological ordering of the given graph. 	4	KTU-June,2022
6	Consider the directed acyclic graph G=(v,E) given in the following figure.  Find any topological ordering of G.		KTU-May,2022
7	a) Give Breadth First Search algorithm for graph traversal. Perform its complexity analysis. b) Define AVL tree. Construct an AVL tree by inserting the keys: 44,17,32,78,50, 88, 48, 62, 54 into an initially empty tree. Write clearly the type of rotation performed at the time of each insertion.	7	KTU JUNE 2022
8	a) Give Depth First Search algorithm for graph traversal. Perform its time complexity analysis.	7	KTU JUNE 2022

9	b) Perform DFS traversal on the following graph starting from node A. When multiple nodes are available for next traversal choose nodes in alphabetical order. Classify the edges of the graph into different category.  .	7	KTU JUNE, 2022

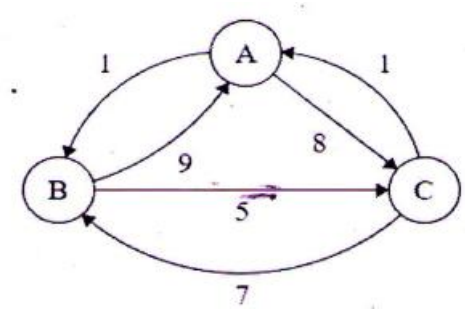
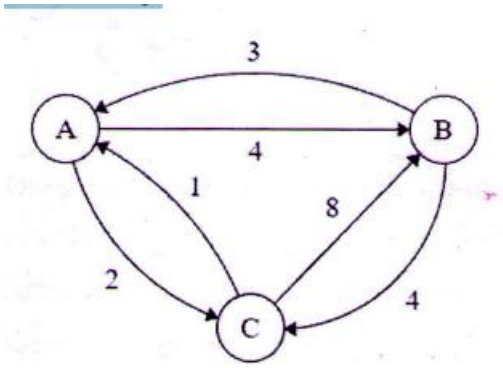
MODULE 3

Sl.No.	Questions	Marks	KTU, Year
1	Write the control abstraction of divide and conquer strategy.	3	KTU-June,2023
2	Compare Strassen's matrix multiplication with ordinary matrix multiplication	3	KTU-June,2023
3	Give the control abstraction of Divide and Conquer algorithm design strategy.	2	KTU-May,2023
4	Apply greedy algorithm for fractional knapsack to find the optimal ordering for loading the items in the knapsack. Let the knapsack capacity, Items | Weight | Profit 1 | 8 | 24 2 | 9 | 18 3 | 5 | 20	3	KTU-May,2023
5	Give the control abstraction of Greedy strategy.	4	KTU-May,2022
6	Why Strassen's matrix multiplication algorithm is better than traditional divide and conquer algorithm for multiplying two square matrices? what is the recurrence for the number of computational steps taken by Strassen's atgorithm and its time complexity?	4	KTU-May,2022
7	Illustrate the divide and conquer approach by applying 2 way merge sort for the input array: [15,l2,l4,l7,ll,l3,l2,l6]. Write the recurrence for merge sort and give the complexity.	7	KTU JUNE 2022

8	Apply Dijkstra's algorithm for single source shortest path to solve the following graph. Assume the source as node A. 	7	KTU JUNE 2022
9	Apply Kruskal algorithm to find minimum cost spanning tree for the following graph. 		

MODULE 4

Sl.No.	Questions	Marks	KTU, Year
1	Differentiate backtracking technique from branch and bound technique.	3	KTU-June,2023
2	What is Principle of Optimality	3	KTU-June,2023
3	Explain about the structure of an optimal parenthesizing of matrix-chain multiplication problem.	2	KTU-May,2023
4	Distinguish the branch-and-bound technique from the backtracking technique	3	KTU-May,2023
5	Discuss briefly the elements of dynamic programming with a suitable example	3	KTU-June,2022
6	Compare backtracking and branch-and-bound design technique	4	KTU-June,2022

7	a) Discuss Floyd-Warshall algorithm for all pair shortest path problem. Solve the following instance using the algorithm.  	7	KTU JUNE 2022
8	Discuss the control abstraction used in backtracking design technique. Draw the state space tree for 4-queens problem.	6	KTU JUNE 2022
9	a) Discuss the elements of dynamic programming by considering the matrix chain multiplication problem. b) Define Travelling Salesman problem (TSP).Apply branch and bound technique to solve the following instance of TSP. Assume that the string vertex as A. Draw the state space tree for each step.  	9	KTU JUNE 2022

MODULE 5

Sl.No.	Questions	Marks	KTU, Year
1	Differentiate P and NP problem. Giye one example to each.	3	KTU-June,2023
2	Define graph coloring problem	3	KTU-June,2023
3	Discuss the need for approximation algorithm.	2	KTU-May,2023

4	Define graph colouring problem	3	KTU-May,2023
5	Define P, NP and NP complete domains.	4	KTU-May,2022
6	Compare Las Vegas and Monte Carlo algorithm		KTU-May,2022
7	a) Prove that CLIQUE Problem is NP Complete. .	7	KTU-May,2022
	b) Write randomized quickset algorithm and perform its expected running time analysis	7	
8	Define approximation algorithm. Give an approximation algorithm for bin packing using first fit heuristic and give its approximation ratio.	7	KTU MAY 2022
9	Discuss the advantages of randomized algorithms over deterministic algorithms. Discuss Las Vegas and Monte Car{o algorithms with a suitable example.	7	KTU MAY 2022

Course Code: CST 362

Course Name:PROGRAMMING IN PYTHON

Module I			
Sl. No	Questions	Marks	Year
1	Jack says that he will not bother with analysis and design but proceed directly to (3) coding his programs. Why is that not a good idea?	3	June 2023
2	Write the output of the following python statements : i) round(I2.57) ii) s//2 iii) int(6.5)	4	June 2023
3	What is the output of the following Python code. Justify your answer. x='abcd' for i in range(len(x)): print(i)	3	May2023(S)
4	Write the syntax and semantics of the multiway-if statement.	3	May2023(S)
5	What is the output of the following print statement in Python? (a) print (9//2) (b) print (9/2)	3	June 2022
6	Write a Python program to count the number of even numbers and odd numbers in a given set of n numbers.	3	June 2022
7	write a python program to find the sum of the cosine series | - xn2l2l + x^414	7	June 2023
8	Write a PYthon Program to find function X^Y or pow(X,Y) without using standar	7	June 2023
9	Write a python program to generate the following type of pattern for the given N (7) rows where N <= 26. A AB ABCD ABCDE	7	June 2023
10	Write a python program to generate prime numbers within a certain ran	7	June 2023
11	Write a Python program to find the roots of a quadratic equation, ax * bx * c= 0 . Consider the cases of both real and imaginary roots.	7	May2023(S)
12	Mention the different typis of loop and control statements allowed in Python (8) and explain each type with suitable examples.	8	June 2022

	Module II		
1	Write the output of following python code : S : "Computer" print(S[::2]) print(S[::-l]) print(S[:])	3	June2023
2	Write a recursive function in python to find GCD of two numbers.	3	June2023
3	Explain the concepts namespace, scope, and lifetime in the case of Python programming language.	3	May2023(S)
4	What are mutable and immutable properties in the case of Python data structures? Give one example each for mutable and immutable data structures in Python.	3	May2023(S)
5	Assurne that the variable data refers to the string ”Python rules!" Use a string method to perform the following tasks: a. Obtain a list of the words in the string b. Convert the string to uppercase c. Locate the position of the string "rules" d. Replace the exclamation point with a question mark	6	June2023
6	Write a code segment that opens a file for input and prints the number of four- letter words in the file	8	June2023 May2023(S)
7	Assume that there is a text file named "numbers.txt"' Write a python program to - find the median of list of numbers in the file without using standard function for median.	10	June2023
8	Use higher order python function filter to extract a list of positive numbers from a given list of numbers. You should use a lambda to create the auxiliary function'	4	June2023
9	Write a Python program to implement Caesar cipher encryption and decryption on a string of lowercase letters. Take distance value and the string as input. (Hint:Caesar cipher encryption strategy replaces each character in the plaintext with the character that occurs a given distance away in the sequence.Encryption:Eg. input: 3, "invade", Eg. output: "lqydgh"Decryption: Eg. input: 3, "lqydgh", Eg. output: "invade")	7	May2023(S)

10	Write a Python program to create a set of functions that compute the mean, ' median and mode of a set of numbers* Each function should expect a list of numbers as an argument and return a single number. Each function should return0 if the list is empty. Include a main function that tests the three functions with a given list.(Hint: Mean: Mean is the average value of a list of numbers.Median: If the number of values in a list is odd, the median of the list is the value at the midpoint when the set of numbers is sorted; otherwise, the median is the average of the two values surrounding the midpoint.Mode: The mode of a list of values is the value that occurs most frequently)	7	May2023(S)
11	Write a Python program to count how many times each character appears in a given string and store the count in a dictionary with a key as the character.	7	June 2022
12	Create a dictionary of names and birthdays. Write a Python program that asks the user to enter a name, and the program displays the birthday of that person.	7	June 2022
	Module III		
1	Illustrate the function of following methods in turtle i) turtle.setheading(0) ii)turtle.forward(50) iii)turtle.left(90)	3	June2023
2	Describe two fundamental differences between terminal-based user interfaces and GUIs.	3	June2023
3	What are the attributes of a turtle object?	3	May2023(S)
4	What are the advantages of GUI based programs over terminal based programs?	3	May2023(S)
5	Write a Python program to draw a hexagon and to fill it with red colour. Explain the turtle methods used in it.	7	June2023, May2023(S)
6	Write a python program to convert a colour image to black and white image.Explain the image methods used in it.	6	June2023, May2023(S)
7	What are the attributes of a window? How can the attribute's value be changed?	4	June2023
8	Write a python function to shrink an image by a given factor. The function suppose to builds and returns a new image which is smaller copy of the argument image,	9	June 2023

	by the factor argument.		
9	How to draw a star shape using a turtle in Python.	5	June 2022
10	Explain basic image processing with inbuilt functions in python.	9	June 2022
11	Write a Python GUI program to take the birth date and output the age when a button is pressed.	7	June 2022
12	How do you display an image in Python GUI?.	7	June 2022
	Module IV		
1	Explain what the - str - method does and why it is a useful method to include in a class.	3	June 2023
2	Compare multiple and multilevel inheritance	3	June 2023
3	What is meant by an abstraction mechanism in programming? Give one example of an abstraction mechanism in Pvthon.	3	May 2023(S)
4	Explain the terms accessors and mutators with regard to Python class definition.	7	May 2023(S)
5	Write Python program to create a class called as Complex to model complex numbers and implement _add_( ) and _mul_0 methods to add and multiply two complex numbers. Display the result by overloading the t and * operator.	9	June 2023
6	Explain multiple inheritance in Python with a suitable example	5	June 2023
7	Write a Python program to create a class called as Rational to model rational numbers and associated operations. Implement the following methods in the class. Use operator overloading. l. Reduce() - to return the simplified fraction form 2. add_() - to add two rational numbers 3. _lt_() - to compare two rational numbers (less than operation)	9	June 2023
8	What is Exception handling? Write a program that opens a file and writes "Hello Good moring" to it. Handle exceptions that can be generated during I/O operations	5	May 2023(S)
9	Write a Python program to define a class Rectangle with parameters height, width and member functions to find	7	May 2023(S)

	area, and perimeter of it.		
10	Illustrate how inheritance and polymorphism can be implemented in Python.	7	May 2023(S)
11	Create an Abstract Base Class called Shape that include abstract methods area() and circumference(). Then derive two classes Circle and Rectangle from the Shape class and implement the area() and circumference() methods . Write a Python program to implement above concept.	7	June 2022
12	How to create a destructor in Python? Give an example.	3	June 2022
	Module V		
1	Write the output of the following python code: import numpy as np arrl : np.arange(6).reshape((3, 2)) arrZ = np.arange(6).reshape((3,2)) arr3 : arrl * arr2[0].reshape((1, 2)) print(arr3)	3	June 2023
2	What is the difference between loc and iloc in pandas DataFrame. Give a suitable (3) example.	3	June 2023
3	Write a Python code that checks to see if a file with the given pathname exists on the disk, before attempting to open a file for input.	7	May 2023(S)
4	What is Flask in Python? What are its basic components?	7	May 2023(S)
5	Write a code segment that prints the names of all of the items in the current working directory.	5	June 2023
6	Write a python program to create two numpy arrays of random integers between 0 and 20 of shape (3, 3) and perform matrix addition, multiplication and transpose of the product matrix.	9	June 2023
7	Write a Pandas program to read a CSV file named 'Diamond.csv' with fields carat, cttt, color, clarity, depth, and price and to print the following: l. Number of rows and columns 2. First five rows	4	May 2023(S)
8	Temperature('c) on different dates is+tured in a csv file as 'Weather_data.csv' with the fields date, temperature and humidity. l.Draw a plot of the weather report with date as the	10	May 2023(S)

	x-axis and temperature as the y-axis. 2. .Draw a scatter plot of the weather report with date as the x-axis and humidity as the y-axis. Give appropriate titles and labels in the plot.		
9	How do you assign a random number to a variable in Python?	3	June 2022
10	What is the use of the os module in python?	3	June 2022
11	Explain how the matrix multiplications are done using numpy arrays.	7	June 2022
12	How to plot two or more lines on the same plot with suitable legends, labels and a title.	7	June 2022

CST 372 DATA AND COMPUTER COMMUNICATION

MODULE 1			
Sl. No	**Questions**	**Marks**	**KTU Month/Year**
1	Define simplex, half duplex and full duplex transmission mode. Give one example for each.	3	DEC 17, APR 18 MAY 19 JUNE 22
2	List and explain different factors which determine the performance of communication in a network?	3	DEC 17 APR 18 DEC 20
3	List various impairments and explain how they affect information carrying capacity of a communication link?	4 9 9, 10	DEC 17, MAY 19, DEC 20 June 23
4	Signal to Noise Ratio is often given in decibels. Assume SNR db=36 and the channel bandwidth is 2Mhz. Calculate theoretical channel capacity?	5	APR 18, DEC 20
5	Describe about time domain and frequency domain concept of a signal in a system. A periodic signal has a Bandwidth of 20 Hz. The highest frequency is 60 Hz. Draw the spectrum if the signal contains all frequencies of same amplitude.	3, 3 8, 4	DEC 18, May 19 JUNE 22/23
6	Differentiate attenuation and Delay Distortion.	3	DEC 18
7	Compare analog and digital communication. What are the advantages of digital communication?	8	June 23
8	Define Channel Capacity. Calculate the appropriate bit rate and signal levels for a channel with 100 Mhz bandwidth and SNR of 255.	5	MAY19 DEC 20

9	Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels. Calculate the maximum bit rate	3	DEC 2020/ June 23
10	What are the important characteristics of a periodic analog signal? If a periodic signal is decomposed into five sine waves with frequencies of 250, 300, 600, 700, and 950 Hz, what is its bandwidth?	3	DEC 2020, June 23
11	How Nyquist theorem applied for a noiseless channel? We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need?	3	JUNE 22
12	What is the thermal noise level of a channel with a bandwidth of 10 KHz carrying 1000 Watts of power operating at 50^{o}C?	4	JUNE 22
13	How capacity of a system is determined in the presence of noise? We have a channel with a 1MHz bandwidth. The SNR for this channel is 63. Then calculate channel capacity.	6	JUNE 22, 23

MODULE 2			
Sl.No	**Questions**	**Marks**	**KTU Month/Year**
1	For a parabolic reflective antenna with a diameter of 6m, operating at12 GHz. Calculate the antenna gain? Given effective area= 56π.	5 3 4	DEC 17 JUNE 22 JUN 23
2	Explain the wireless propagation techniques	5 3 5 5	DEC 17 DEC 18 DEC 19 SEP 20
3	Compare terrestrial and satellite microwave transmission.	4 3	MAY 19 JUNE 22
4	Explain the working principle of parabolic reflective antenna with suitable diagrams.	5 5	MAY 19 DEC 20
5	Transmission characteristics and modes of Fibre Optic cable differs from Coaxialcable. How?	3 3 10	SEP 20/ DEC 20 JUN 22
6	Explain terrestrial microwave and satellite microwave transmission	6	DEC 20
7	What are the three major classes of guided media.	9	DEC 20
8	What is the function of twisting in a twisted pair cable?	3	JUN 23
9	For multicast communications which type of wireless transmission waves are suitable? Justify your answer	3	DEC 20
10	Describe about the physical properties and transmission characteristics of coaxial cable.	8 10	JUNE 22 JUN 23
11	Compare the different wireless propagation methods used in unguided media.	6 3	JUNE 22 JUN 23
12	Explain the following terms: i) Direct broadcast satellite (DBS) ii) Isotropic antenna	4	JUN 23

MODULE 3			
Sl. No	**Questions**	**Marks**	**Month/ Year**
1	Show the equivalent analog sine-wave pattern of the bit string 00110101using amplitude shift keying, frequency shift keying and phase shift keying	3	DEC 17
2	Explain the modulation technique used in Asymmetric DigitalSubscriber Line (ADSL) and cable modems	4	DEC 17
3	State Sampling theorem. With help of suitable diagrams, explain the process of transforming analog data in to digital signal using Pulse CodeModulation technique	5 3 9 8 10	DEC 17 SEP 20 DEC 20 JUNE 22 JUN 23
4	Describe BFSK and QPSK. Given the bit pattern 101110001. Encode the stream using BFSK and QPSK	5 4	DEC 20 JUN 23
5	Convert the bit stream 101010 into analog signals by using ASK, BFSK and BPSK.	3 6 3 3	DEC 20 JUNE 22 May 19 JUN 23
6	Explain the techniques to convert analog data to analog signal with suitable diagrams.	6	JUNE 22
7	Differentiate amplitude modulation and frequency modulation	8	DEC 18
8	Encode the bit stream 10101010 into the following line coding schemes assuming that the last signal level has been negative: i) NRZ-I ii) NRZL iii) Manchester iv) Differential Manchester v) Bipolar AMI Pseudoternary	6 6 3 4 5	MAY 19 JUN 23 JUN 22 DEC 20 DEC 17
9	Convert the bit stream 101010 in to analog signals by using ASK,Binary FSK and Binary PSK	3 3	MAY 19 JUN 23
10	Describe about delta modulation with neat diagrams.	6 8 8	MAY 19 JUNE 22 JUNE 23
11	A bandpass signal has a bandwidth of 4MHz. To convert to digital signal, what is the minimum sampling rate required for this signal?	3	DEC 20

MODULE 4			
Sl. No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	What type of multiplexing is preferred in optical fiber communication? Justify your answer	3 3 3 3	DEC 17, APR 18 JUNE 22 JUN 23
2	Explain different types of TDM with suitable diagrams	5 3 8. 3	DEC 17 DEC 19 JUNE 22/23
3	With suitable example explain the working principle of Code division multiplexing for CDMA technology.	6, 10	JUNE 22/23
4	Given the bit pattern 101110001. Encode the stream using BFSK and QPSK.	5	DEC 18
5	Explain frequency division multiplexing. How is interference avoided by using FDM?	5 6 6	DEC 18 MAY 19 JUN 23
6	Discuss WDM & SDM.	5	MAY 19
7	Explain Direct sequence spread spectrum with sufficient figures.	5 8	DEC 17 JUNE 22
8	How does spread spectrum eliminates narrow band interferences?Explain Direct Sequence Spread Spectrum(DSSS) technique.	5	DEC 17

MODULE 5			
Sl.No	**Questions**	**Marks**	**Month/Year**
1	What do you meant by single bit error and burst error	3	APR 18
2	Why would you expect a CRC to detect more errors than a parity bit?	5 3	DEC 17 DEC 18
3	The data to be transmitted is given below. If it is send with odd parity, what will be the parity bit generated? a) 11010 b) 000000 c) 01010000	3	JUNE 22
4	In a CRC error-detecting scheme, choose divisor polynomial P: x 4 + x + l. Encode the bits 10010011011	7	DEC 18
5	Using CRC, given the data word 1010011110 and the divisor 10111 i. Show the generation of the codeword at the sender site Show the checking of the codeword at the receiver site OR Given the data word 1001001111 and the devisor 10111, show the generationof the CRC codeword at the sender site using binary division.	10 10 10 5	MAY 19 DEC 20 JUN 23 DEC 18
6	Explain the datagram approach for packet switching network. What is the significance of packet size in packet switching network? .	5, 5 5 5, 6	DEC 17/19 SEP 20 JUNE 19/ 22
7	Differentiate Datagram and Virtual-circuit packet switched networks.	5, 5,7 5 8, 10	DEC 17/18/19 MAY 19 JUNE 22/23
8	What is Circuit switching? Explain the three phases in Circuit switching with suitable diagrams	10 3, 3	MAY 19 JUN 22/23
9	Define Hamming distance. Find the hamming distance for the following pairsof data:(101010, 111000), (111110, 010101), (111010, 000010) and (110011, 001100)	5.6 4 6,3	DEC 17/20 MAY 19 JUNE 22/23
10	Distinguish between forward error correction and error correction by retransmission.	4	DEC 20
11	How errors are detected using parity checking? If the following sets of bits are sent with even parity, what should be the parity bits generated? a) 1100110 b) 0000100 c) 111111 d) 1111011	4, 5	JUN 23 MAY 19
12	What are the different types of errors occurring in data communication? What do you mean by error control?	10 3	JUN 23 APR 18

HUT 300: INDUSTRIAL ECONOMICS AND FOREIGN TRADE

	MODULE 1		
1	Why does an economic problem arise? What are the basic economic problems?	7	KTU,KTU Dec 2021
2	Explain Production possibility curve? With the help of a production possibility curve, explain (i) Trade Off (ii) Why PPC is concave to the origin?	3, 7	KtuDec2021 KTU June 2023
3	Explain consumer equilibrium? Explain consumer surplus? Explain producer surplus?	3	KTU
4	a. What should be percentage change in price a product if the sale is to be increased by 50% and its price elasticity of demand is2 b. A consumer purchases 50 units of commodity× when its price is Rs.8/- per unit. In the next month he purchased 60 units at the same price. this was due to an increase in the price of another commodity y from Rs.10 to 12. Calculate cross elasticity of demand and interpret the result. c. Define the cross elasticity of demand a tea manufacturing company was able to sell 800kg of the price of coffee was Rs 70 per kg. Later they were able to sell 9000 kg when the price of coffee became Rs80 per kg. Calculate the cross elasticity of demand for tea. Are the commodities substitute or complimentary? d. Define price elasticity of demand. A company producing soft drink is selling its product for Rs.22. It sells 1000 units, and then increases the price to Rs.24. Now sales fall to 900 units. What is the price elasticity of soft drink? Is the demand elastic or inelastic? Why? e. What is cross elasticity of demand? Suppose cross elasticity of demand between X and Y is 0.5. If there is a 50 percent change in the price of Y, what will be the percentage change in the quantity demanded of X?	7	KTU KTU DEC 2022
5	a. Demand function of a product is given as D = 50-2p and supply function S + 20 + 3p. What will be the equilibrium price	3	KTU, KTU Dec 2022

<table>
<tr><td></td><td>and quantity of the product.
b. The demand function of a product is given as D = 60 - 2P and the supply function S = 30 + 4P. Estimate equilibrium price and equilibrium quantity. Also find the excess supply when Price equals Rs.6?</td><td></td><td></td></tr>
<tr><td>6</td><td>a. Explain Dead weight loss.
b. Suppose the govt. imposes a tax on a commodity where the tax burden is met by the consumers. Draw diagram and explain dead weight loss. Mark consumer surplus, producer surplus, tax revenue and dead weight loss in the diagram
c. What is deadweight loss of a tax? Examine the consumer and producer surplus before and after a tax with the help of a diagram.</td><td>7</td><td>KTU, KTU Dec 2022 KTU June 2023</td></tr>
<tr><td>7</td><td>What are the merits and demerits of Joint stock companies?</td><td>7</td><td>KTU, KTU June 2023</td></tr>
<tr><td>8</td><td>a. Prepare a utility schedule showing units of consumption, total utility and marginal utility. Point out any three limitation of the law.
b. Draw total utility and marginal utility curves and derive the three relations between marginal utility and total utility.</td><td>7</td><td>KTU, KTU Dec 2022</td></tr>
<tr><td>9</td><td>How is elasticity of demand measured according to the percentage method? How is the measurement of elasticity of demand useful for the government.</td><td>7</td><td>KTU</td></tr>
<tr><td>10</td><td>Calculate the marginal utility from the following data
<table>
<tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>TU</td><td>11</td><td>19</td><td>26</td><td>31</td><td>34</td><td>36</td><td>36</td><td>30</td></tr>
</table></td><td>4</td><td>KTU June 2023</td></tr>
<tr><td colspan="4">MODULE 2</td></tr>
<tr><td>1</td><td>a.In the production function θ = 2L½ K ½If L + 36 how many units of capital one needed to produce 60 units of output.

b. A firm’s total cost function is given by the equation, TC = 4500 + 10Q +25Q2
.Write the expression for the following cost concepts. (a) AFC (b) AVC (c) AC (d) MC</td><td>3
4</td><td>KTU
KTU June 2023</td></tr>
<tr><td>2</td><td>a. In the short run AVC <P <AC. Will the firm produce or shut down? Give reason ?
b. Explain shut down point in the short run with the help of diagram</td><td>3
4</td><td>KTU
KTU June 2023</td></tr>
<tr><td>3</td><td>Define Isoquants and properties, Explain Isocost line, Explain Expansion path, Explain Cobb-Douglas production function</td><td>7</td><td>KTU</td></tr>
</table>

4	Differentiate explicit cost and implicit cost, Explain Sunk cost	3	KTU
5	Suppose monthly fixed cost of a firm is Rs.40000 and its monthly total variable cost is Rs.60000. If the monthly sales is Rs.120000 estimate contribution and break even sales. ii. If the firm wants to get a monthly profit of Rs.40000 what should be the sales? iii. The total cost function of a firm is given as TC=100+50θ- θ2+ θ3. Find marginal cost when output equals 5 units. b. The total sales of a manufacturing firm are Rs.20000 in this year. Its variable costs one Rs.8000 where its fixed costs are Rs.6000 for that year. Find out the break-even point of this firm. c. Suppose a firm pays Rs.10000 as monthly rent and Rs.10000 as interest payment.Its monthly expenditure on raw materials is Rs.40000 and it get monthly sales revenue of Rs.80000. The price of one unit of output is Rs.40. Estimate i) PV Ratio ii) Break even sales iii) Break-even output iv) Profit earned v) Margin of safety d. Consider the following data of a company for the year 2022. Sales Rs.80000, Fixed Cost is Rs. 15000, Variable cost is Rs. 35000. Find the following (a) Breakeven Sales (b) Contribution (c) Margin of safety (d) Profit.	7 10	KTU, KTU Dec 2022 KTU June 2023
6	Explain Law of variable Proportions with a diagram.	7 10	KTU KTU June 2023
7	What are the advantages of large-scale production? Explain producer equilibrium with the help of a diagram.	7	KTU
8	Explain producer equilibrium with the help of isoquants and is cost line. What is expansion path.	7	KTU, KTU Dec 2022
9	Explain Returns to scale OR Long run production function, Represent it using a figure.	7	KTU, KTU Dec 2022
10	The total cost function of firm is given as TC=500+5Q 4Q2+Q3. Estimate TVC, TFC and MC when output equals 10 units.	7	KTU, KTU Dec 2022
MODULE 3			
1	What is collusive oligopoly? What is non-price competition under Oligopoly? Give examples of non-price competition under oligopoly? Explain linked demand curve model.	7	KTU Dec 2021

2	What is Predatory pricing? Describe on product pricing and explain the different methods used for pricing.	7 10	KTU Dec 2022 KTU June 2023
3	Explain the equilibrium of a firm earning supernormal profit under monopolistic competition. Draw figures showing the determination of equilibrium under both.	3	KTU KTU Dec 2022
4	Make comparison between monopoly and perfect competition and Oligopoly	7	KTU, KTU June 2023
5	What is inelastic demand?	3	KTU Dec 2022
6	Suppose AC>Price>AVC. Will a producer produce or shutdown in the short run? Give reason.	3	KTU Dec 2022
7	Why a firm under perfect competition is called a price taker?	3	KTU Dec 2022
8	Explain Price rigidity under oligopoly with the help of kinked demand curve. Why price is rigid under oligopoly?	7	KTU, KTU Dec 2022
9	a. With the help of a diagram explain equilibrium under monopolistic competition. b. What are the features of Monopolistic competition, Suppose a firm under monopolistic competition is getting supernormal profit. Draw a diagram and explain this situation	7	KTU, KTU Dec 2022
10	Explain Kinked Demand Curve	7 4	KTU KTU June 2023
MODULE 4			
1	Explain in detail the circular flow of income in a four sector model with a neat diagram.	3 10	KTU KTU June 2023
2	Explain the GNP Deflator, GDP and GNP	3	KTU KTU June 2023
3	Explain demand pull inflation , Explain cost push inflation. Are the monetary or fiscal measures more effective in controlling inflation?	7 10	KTU KTU June 2023
4	Distinguish between a bond and a share?	3 4	KTU KTU June 2023
5	Distinguish between NSE and BSE , Distinguish between	7	KTU

	NIFTY and SENSEX		
6	Distinguish between Demat Account and Trading Account	3	KTU
7	Distinguish between final goods and intermediate goods.	3	KTU Dec 2022
8	a. GDP of a country = 1500 crores, Depreciation =150 Crores NFIA= 50 crores. Estimate GNP,NDP and NNP b. Estimate GDPmp. GNPmp and National income. Private consumption expenditure - 2000 (in 1000 crores) Govt. Consumption - 500 ,NFIA - (300) ,Investment - 800 Net Export – 700, Depreciation - 400 Net internal tax – 300 c. From the given below estimate Gross National Product, Net National Product and National Income. GDP - 5000 (in 100 billion) NFIA - 50 Indnet - 70 Subsidies- 20 Depreciation- 30 d. From the data given below estimate the NDP using Item Rs Consumption Expenditure 3000 Investment Expenditure 2000 Govt. Expenditure 700 Exports 600 Imports 300 Intermediate consumption 2000 Wages and Salaries 2000 Rent 500 Interest 500 Profit 1000 e. How is national income estimated according to the income method? Estimate NDP and NNP from the given data (all figures in Rs. Crores). Wages and salaries = 800, Rent = 300, Depreciation = 200, Interest = 400, Net Indirect tax = 400, NFIA = 100, Profit = 400. f. Suppose the national income of a country is Rs1000 and depreciation equals Rs300. If NFIA equals Rs (-400) and Indirect Taxes equals Rs300, estimate NNP, NDP, GDP and GNP (all figures in Rs. Crores).	7	KTU, KTU Dec2021, KTU Dec 2022, KTU June 2023

	g. Estimate GDPMP , GNPMP and National Income. Private consumption expenditure = 2000 (in 000 crores), Government consumption = 500, NFIA= -300, Investment=800, Net exports=700, Depreciation=400 and Net-indirect tax=300.		
9	Distinguish between money market and capital market ?	7	KTU Dec 2021
10	What is monetary policy? What are the monetary policy measures?	7	KTU Dec 2022
MODULE 5			
1	What is free trade? What is Devaluation? Explain the J-curve effect? Suppose the sum of elasticity of export and import is less than one. What will be the effect of devaluation? What are the merits of quota restrictions? What are the arguments in favour of free trade? What are the tariff barriers? Explain its impact on the economy.	7	KTU Dec 2021
2	Effects of International Trade	4	KTU June2023
3	How is National income estimated under Product method and expenditure method, income method	7	KTU
4	What are the monetary and fiscal policy measures to control inflation?	3	KTU Dec 2021
5	What is international trade? List out the advantages of foreign trade ? What are the disadvantages of foreign trade? Examine the effects of quotas on international trade.	7	KTU, KTU Dec 2022
6	What do you mean by labour augmenting technical progress?	3	KTU Dec 2022
7	What is a Trading account? Point out any three items coming under unilateral transfers account.What is balance of payments?	3	KTU Dec 2022 KTU June 2023
8	Examine the comparative cost theory. Point out any two criticisms against this theory. Explain absolute advantages theory with the help of an example	7	KTU Dec 2022 KTU June 2023
9	What is protection? State any five arguments in favour of protection.	7	KTU Dec 2022 KTU June2023
10	Evaluate the success or failure of devaluation when the demand for import is more elastic or less elastic.	7	KTU Dec 2022 KTU June 2023