COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra)

SHIVAJI NAGAR, PUNE – 411 005

T1 Examination

SUBJECT: Renewable energy (ILOE)

Class: Third year B.Tech

Max. Marks: 20

Date: 02/25/2023

MIS No: 112003100

Duration: 1 Hour

Instructions:

1. Except scientific (non-programmable) calculator, no electronic device is allowed.
2. Exchange of any material (pencil, pen, eraser etc.) is not allowed.
3. Figures to the right indicate full marks.
4. Write your MIS no on question paper.
5. All questions are compulsory.

Q (1)	Draw the wind turbine output v/s wind speed curve and define the parameters of the curve in details	(5)
Q (2)	Write down the working mechanism of non-concentrating solar thermal collector in detail. Draw the diagram and explain the components of the solar collector	(5)
Q (3)	Derive the Betz limit for the horizontal axis disc type wind turbine	(5)
Q(4)	Explain in detail the working mechanism of Pelton wheel hydraulic turbine	(5)

COLLEGE OF ENGINEERING PUNE

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END Semester Examination

Programme: B.Tech | **Semester: VI**

Course Code: CT-21012 | **Course Name: Data Science**

Branch: Computer Engineering | **Academic Year: 2022-23**

Duration: 3 Hours | **Max Marks: 60**

Student PRN No.

1	1	2	0	0	3	1	0	0

Instructions:

1. Figures to the right indicate the full marks.
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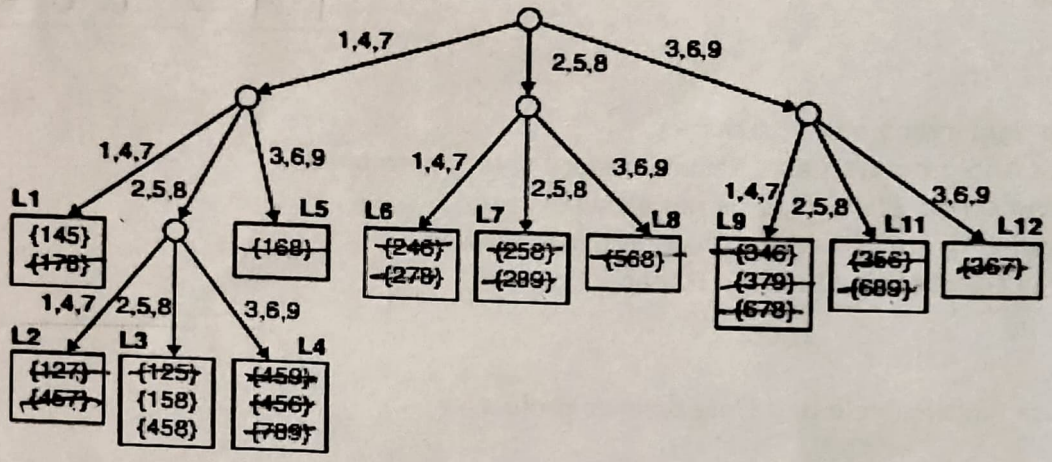
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of stationery, calculator etc. not allowed.
5. Write your PRN Number on Question Paper.

			Marks	CO	PO
Q1	A	Discuss the life cycle of a Data Science project.	8	2	2,5
	B	i) Categories the given attribute into their respective categories (to most appropriate category): nominal, binary, ordinal, interval-scaled, ratio-scaled. a) Colour: red / green / blue / yellow b) Height: short / medium / taller / tallest c) Disease Test: Cancer / Non-cancer d) Area of house in square meter e) Temperature in fahrenheit	4	1	1
		ii) Also mention which of the properties (distinctness, order, equal distance, true zero) are possessed by each of the attribute categories: nominal, ordinal, interval-scaled and ratio-scaled			
Q2	A	Let c1, c2, and c3 be the confidence values of the rules {p} ⟶ {q}, {p} ⟶ {q, r}, and {p, r} ⟶ {q}, respectively. If we assume that c1, c2, and c3 have different values, what are the possible relationships that may exist among c1, c2, and c3? Which rule has the lowest confidence?	4	5	2,5, 6
	B	Give formula for Minkowski distance metric. Consider the given 2 dimensional dataset, given a new data point X = (1.4, 1.6), find the closest data point from the given data set using following methods: i) Euclidean distance ii) Manhattan distance	5	3	5,9

	A_1	A_2
X_1	1.5	1.7
X_2	2	1.9
X_3	1.6	1.8
X_4	1.2	1.5
X_5	1.5	1.0

Q3 A

3 5 2,5, 6



The Apriori algorithm uses a hash tree data structure to efficiently count the support of candidate itemsets. Consider the hash tree for candidate 3- itemsets shown in figure above.

i) Given a transaction that contains items {1, 3, 4, 5, 8}, which of the hash tree leaf nodes will be visited when finding the candidates of the transaction?

ii) Use the visited leaf nodes in part (i) to determine the candidate itemsets that are contained in the transaction {1, 3, 4, 5, 8}.

B

6 5 2,5, 6

TID	Items
1	A, B, C
2	A, B
3	A, D, E
4	D, E
5	C, E
6	A, D, E

Consider the dataset given above. Use Apriori algorithm to find out frequent items and generate rules using those frequent items. Required threshold for support = 33.34% and confidence = 60%

Q LAIDE3

Q4 **A** For the given data set use linear regression to estimate the target variable 'Y' as a function of the input feature 'X' (hypothesis: $h_\theta(x) = \theta_0 + \theta_1(x)$). — 8 — 5 — 2,5, 6

i) Which of the following given θ parameter is best comparatively.
Values: ($\theta_0 = 1, \theta_1 = 0.5$), ($\theta_0 = 1, \theta_1 = 1.5$), ($\theta_0 = 1.5, \theta_1 = 1$).

ii) Plot the hypothesis for best θ parameters of (i) also find the cost function using it.

iii) Use answer of (i) to evaluate $h_\theta(x = 12)$

MSE

X	Y
6	18
7	21
8	24
9	27
10	30

B Give and explain the pseudo algorithm for Gradient Descent. — 4 — 5 — 2,5, 6

C Discuss logistic regression. Explain the hypothesis function for the same. Describe how Logistic regression can be used as classifier? — 6 — 5 — 2,5, 6

Q5 **A** Consider bloom filter of size 11 with two hash functions h_1 and h_2 as given below. — 8 — 3 — 5,9

$h_1(x)$: The first hash function h1 maps an integer x to a hash value $h_1(x)$ as follows: Write the binary value of integer x. Select the bits at the odd bit positions starting from the right most (least significant bit at position 1 i.e. odd) bit. Extract these odd bits of 'x' and convert it to its equivalent integer 'i'. Take (i modulo 11) to map x into hash value $h_1(x)$.

$h_2(x)$ is computed in exactly the same manner except that it collects the even bit positions of the binary representation of x, convert the binary obtained into its equivalent integer i. The modulo is also computed using (i modulo 11) to map x into hash value $h_2(x)$.

Input stream consists of integers.

i) Show how bloom filter is updated step by step as input stream 25, 159, 585, 46 is received.

ii) Check whether number 118 is passed through the bloom filter or not. Comment on its result obtained.

B Discuss the issues in stream processing. — 4 — 3 — 5,9

COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)

END Semester Examination

(CT-21014) Design and Analysis of Algorithms

Course: B.Tech , Semester VI

Branch: Computer Engineering

Academic Year: 2022-2023

Duration: 3 Hours

Max.Marks:60

Date: 30/04/2023

Instructions:

Student MIS No. 1 1 2 0 0 3 1 0 0

1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of stationery, calculator etc. not allowed.
5. Write your MIS Number on Question Paper
6. Figures to the right side are marks, co and po mappings respectively

			Marks	CO	PO
Q 1	a	Suppose you are choosing between the following two algorithms: i. Algorithm A solves problems by dividing them into five subproblems of half the size, recursively solving each subproblem, and then combining the solution in linear time. ii. Algorithm B solves problems of size n by recursively solving two subproblems of size n-1 and then combining the solutions in constant time. What are the recursive functions and running times of each of these algorithms (in big-O notation)?	4	1,2	2
	b	A professor has a list of roll numbers and names of students in increasing order of roll numbers. The professor circulates a blank attendance sheet to take attendance of students present for a quiz. The attendance sheet contains roll numbers and signatures of students in random order. Write an algorithm to find out the names of students absent for the quiz. Mention the design technique used by you for the algorithm.	2	2	2
	c	Encode the string "college of engineering pune", using Huffman coding . what is the code and code length for the string "ceriel" using codeword formed? Assume ' '(space) is also one of the alphabets.	3	3	2
	d	Following algorithms compute the value of n^2 for a given integer n. What are their time complexities? Which one is better?	3	3	2

(i)

```
Algorithm sum1 (n)
{
   sum = 0;
   for i = 1 to n do
      sum = sum + }
   n;
   return sum;
}
```

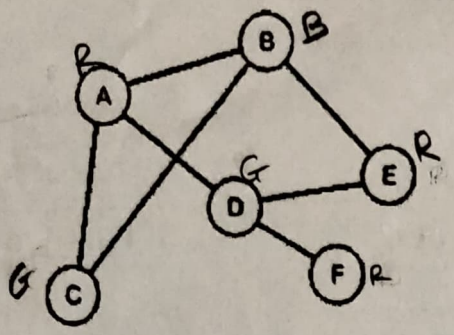
(ii)

```
Algorithm sum2 (n)
{
   sum = n * n;
   return sum;
```

(iii)

```
Algorithm sum3 (n)
{
   sum = 0;
   for i = 1 to n do
      for j = 1 to n do
         sum = sum +1;
   return sum;
}
```

Q 2	a	Apply the backtracking algorithm to color the following graph and write the chromatic number for the same (it is a minimum required number to color the vertices so that no two adjacent vertices has the same color).	3	3,4	2

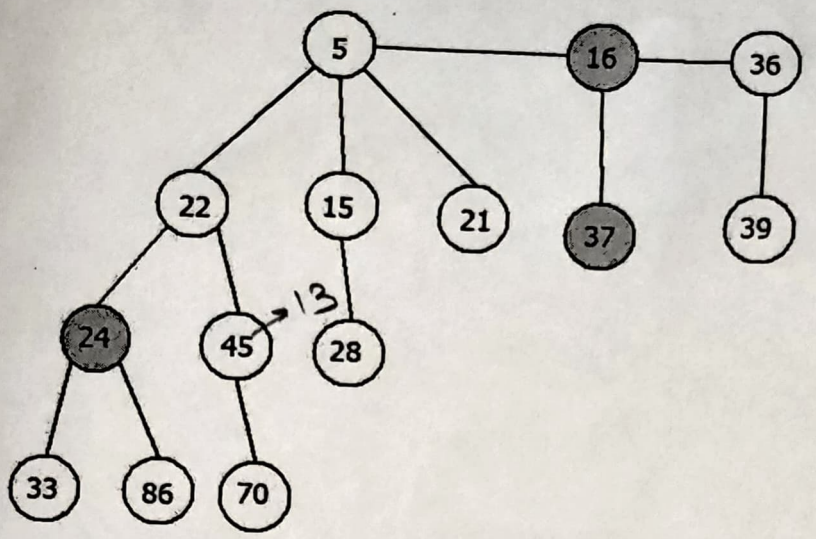


	b	Rohan knows that a palindrome is a string that if written and read in reverse with original it will be same, he read the word written on his friend's car as "mymacercar" , Help him to know following things, using dynamic programming approach:	1	3,4	1
		i. What is the length of longest common palindrome does this word has? Help rohan to calculate the same?	1		
		ii. How many such longest common palindromes are there in this word?	1		
		iii. List out those all longest common palindromes available in this word.	1		
	c	A salesperson need to visit 4 different cities and need to come back to same city again with minimum distance travelled. Following is the matrix of distance of cities which are connected. Solve the following instance of travelling sales person problem using dynamic programming approach	5	3,4	1

$$\begin{bmatrix} \infty & 12 & 5 & 7 \\ 11 & \infty & 13 & 6 \\ 4 & 9 & \infty & 18 \\ 10 & 3 & 2 & \infty \end{bmatrix}$$

Q 3	a	Let us assume that W_i=[5,10,15,20,25] and W=30. What are the different combinations of subsets possible to get sum as W? Solve the problem by using backtracking approach. Show the state space tree for the same	4	3,4	2
	b	Construct the string matching finite automata machine for the pattern P = aabab and illustrate its operation on the text string T = aaababaabaababaab	3	4	3
	c	Using Euclidian algorithm calculate GCD of the pair (72345, 43215) Also calculate the multiplicative inverse for the same.	5	4	2
Q 4	a	Consider the Fibonacci heap shown in figure below,where node 16,37,24 are marked nodes. Decrease key 45 to 13, and show step by step pictorial presentation for decrease and ~~consolidate~~ operation.	5	4	2

all cascading cut oper^n,



b Write the potential function for the above Fibonacci heap. What is the amortized cost of the answer Fibonacci heap — 3 4 2

c Let there be N tasks and N workers. The N X N cost matrix is as follows: — 4 4 1

Workers \ Tasks	1	2	3
A	18	3	15
B	4	7	14
C	13	12	7

Solve the above assignment problem in order to minimize the task using branch and bound

OR

c Following are the items given with their respective weights and values. An user want to carry items in his knapsack with the capacity as W=6 units, Help him to carry the items so that the total value of his knapsack should be maximum. Solve the problem using branch and bound

Items	Weights	Values
1 pen	2	8
2 book	3	6
3 key	2	4

Q 5 a Explain following with respect to examples — 9 5 3

i. Difference between NP complete and NP hard
ii. Difference Between P and NP
iii. Fibonacci heap and binomial heap

b Show that 3-satisfiability problem is polynomially transformable to the colorability problem. Transform the expression $F = (x_1 + x_2)(x_1' + x_3)$ to a graph with color assignments so that no adjacent vertices have the same color. — 3 5 3

OR

b Prove the 3CNF satisfiability problem can be reduced to Clique decision problem by showing it to be polynomially transformable from CNF satisfiability problem. Transform the expression $F = (y1 + y2')(y2 + y3')(y3 + y1')$ into a graph and list the cliques in it.

---All the Best---

COLLEGE OF ENGINEERING PUNE
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END Semester Examination

Programme: B.Tech

Semester:

Course Code: AS(HS) - 21008

Course Name: Finance for Engineers

Branch: Computer, ENTC, Electrical & Instrumental

Academic Year: 2022-23

Duration: 2 Hours

Max Marks: 60

Student PRN No.

1	1	2	0	0	3	1	0	0

Instructions:

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4. Exchange/Sharing of stationery, calculator etc. not allowed.
5. Write your PRN Number on Question Paper.
6. **ANSWER ANY FOUR QUESTIONS**

			Marks	CO	PO
Q 1		From the **Following trial balance of 31st March, 2022 prepare Balance sheet only. DON'T prepare profit & loss account. (write the figure of profit as balancing figure on the liability side)**	15	a	

Particulars	DR	CR
Capital		2,40,000
Drawings	8,000	
Stock	46,000	
Purchases	2,00,000	
Sales		11,60,000
Furniture	80,000	
Sundry Debtors	1,60,000	
Freight	3,600	
Trade Expenses	4,400	
Salary	44,000	
Rent	28,000	
Advertisement	40,000	
Insurance Premium	4,000	
Commission		80,000
Discount	2,000	
Bad Debt	12,000	
Provision for bad debt		8,000
Creditors		1,12,000
Bank balance	2,48,000	
Building	4,80,000	
Machinery	2,40,000	
Total	**16,00,000**	**16,00,000**

Adjustments:

(a) Stock on 31st March, 2022 was valued at Rs. 40,000
(b) Unexpired insurance of Rs. 800 is included in the figure of insurance.
(c) Provision for bad debts is to be brought upto 5% of sundry debtors.
(e) Furniture & Building is depreciated @ 5% per annum while machinery by 20%

Q 2		**Write short Notes – Any Three** (A) Why Commodity Markets are necessary (B) Distinguish between equity shares, preference shares & Debentures (C) Explain the terms CRR, SLR & REPO (D) Explain functions of capital market. What is primary & secondary market?	15	d	
Q 3		**Income Statement**	15	b	

Particulars	**2021-22**	**2022-23**
Sales (assume credit sales)	9,00,000	11,22,000
Less cost of goods sold	7,08,000	8,94,000
Gross profit	1,92,000	2,28,000
Less operating expenses	1,47,000	1,71,000
Net profit	45,000	57,000

Balance sheet

Capital & Liabilities	**2021-22**	**2022-23**
Share capital	2,25,000	2,25,000
Reserves & surplus	75,000	1,26,000
Long term loan	-	90,000
Current Liabilities:		
Payables	1,50,000	2,28,000
Total	**4,50,000**	**6,69,000**
Assets		
Non-Current Assets (Net Block)	90,000	1,20,000
Current Assets:		
Receivables	1,50,000	2,46,000
Bank balance	30,000	21,000
Inventory (stock)	1,80,000	2,82,000
Total	**4,50,000**	**6,69,000**

Assume opening stock as on 1st April 2021 Rs. 1,20,000

Calculate following ratios for 2021-22 & 2022-23 & comment

(i) Gross profit ratio
(ii) Operating profit ratio
(iii) Capital turnover ratio
(iv) Stock turnover ratio
(v) Return on capital employed
(vi) Receivables collection period

Q 4	a	A Forging company is planning to buy new machinery for Rs. 3,00,000. Machine has a life of 4 years. It is expected to generate cash flows as follows	9 +6	c	

Years	Cash flows after considering depreciation
1	1,05,000
2	1,14,000
3	1,20,000
4	63,000

Consider Present value factors at 14% for four years, which are 0.88, 0.77, 0.67 & 0.59

1) Calculate Net present Value (NPV) will you advice the management to buy this machine
2) Calculate simple pay-back period

Q 5	A	Assume that selling price of a product is Rs. 300 per unit. Unit variable cost is Rs. 210 Total fixed cost p.a. is Rs. 72 Lakhs Compute: (i) Contribution per unit (ii) Compute P/V ratio (iii) Compute Break Even point in Rupees sales as well as Unit sales (iv) If required profit is Rs. 24 Lakhs. Find out required sales (v) If variable cost per unit increases to Rs. 240 per unit & selling price is increased by Rs. 20 per unit, what will be the new break-even point?	15	b	

COLLEGE OF ENGINEERING, PUNE

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END Semester Examination

Programme: T Y B Tech | **Semester: VI**

Course Code: IOC21005 | **Course Name: Renewable Energy**

Branch: All Branches | **Academic Year: 2022-23**

Duration: 3 hours | **Max Marks: 60**

Student PRN No.

1	1	2	0	0	3	1	0	0

Instructions:

1. Figures to the right indicate the full marks.
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			Marks	CO	PO
Q 1	a	What are the environmental impacts of fossil fuel usage. In India, to what extent (in percentage) does fossil fuel and non-fossil fuel contribute to electric power generation.	4	1	7
	b	Referring to the reserves of fossil fuel in India, what strategies will you suggest for a sustainable development. Discuss briefly the pros and cons of renewable energy for power generation on a large scale	4	2	7
Q 2	a	What are the different components of a horizontal-axis wind turbine? Enlist and give the functions of these parts.	4	3	1
	b	What parameters you will consider for building a hydroelectric power plant. What are the environmental impact of hydropower generation?	4	3	6,7
Q 3	a	Explain in detail the gasification process showing the reactions occurring therein.	5	4	1
	b	A gasifier having thermal efficiency of 80% is used to run a diesel engine having an efficiency of If the rating of the engine is 5 kW and has to be run for 6 h/day, how much wood 30% having a calorific value of 25,000 kJ/kg needs to be fed to the gasifier annually. generator → 90% efficiency	4	5	2
	c	Differentiate between the fixed dome and floating dome types of the biogas digester. Give a minimum of three valid points of difference.	3	4	7
Q 4	a	What is the utility of a fuel cell? Discuss the points which work to favor and against this technology. List the applications where fuel cells can be deployed.	6	3	6,7

	b	Explain the construction and functioning of a polymer electrolyte membrane (PEM) fuel cell with a neat diagram. What are the major advantages of PEM technology?	6	4	1
Q5	a	What is the cause of the tidal phenomenon? Explain the typical elements of a barrage type of tidal power scheme.	4	4	7
	b	How many tides are witnessed in a day? Explain with a neat sketch explain a single basin single tide and single basin double tide scheme.	4	5	7
Q 6	a	Using a suitable schematic discuss binary cycle geothermal power plant. When is such a plant used at a potential geothermal site?	6	5	7
	b	You are a geothermal engineer. Which are the elements you will search for in constructing a fully functional and reliable geothermal power generation system. List the different types of geothermal resources giving a brief description of each.	6	5	6,7

COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)

END Semester Examination

Programme: B.Tech

Semester: VI

Course Code: (CT-21015)

Course Name: Software Engineering Mini Project Stage- II

Branch: T.Y. B.Tech(Computer)

Academic Year: 2022-23

Duration: 2hrs

Max Marks: 40

Student PRN No.

1	1	2	0	0	3	1	0	0

Instructions:

1. Figures to the right indicate the full marks.
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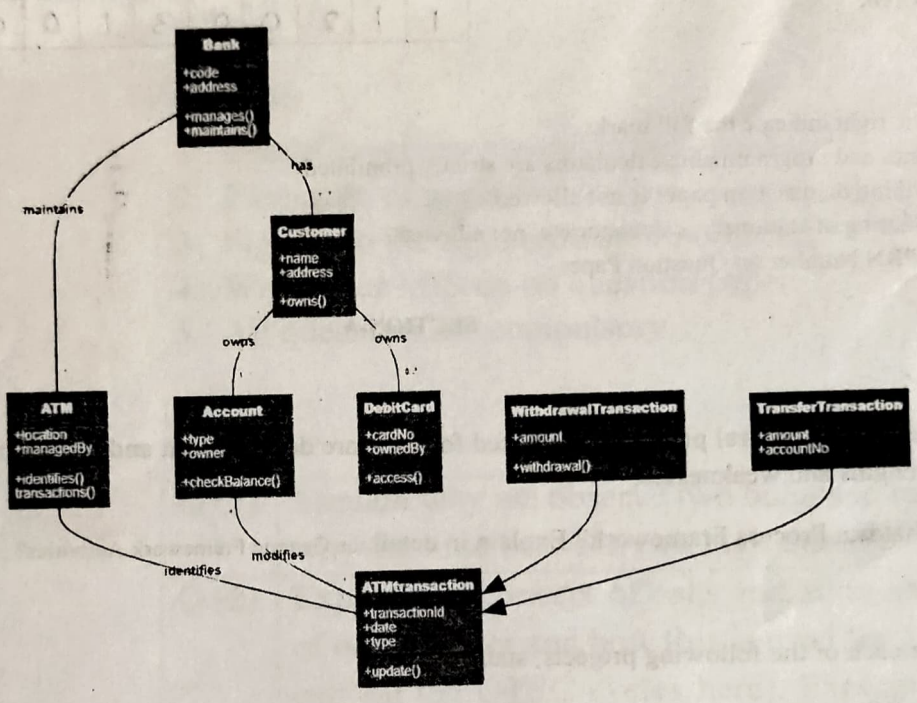
4. Exchange/Sharing of stationery, calculator etc. not allowed.
5. Write your PRN Number on Question Paper.

SECTION-A

			Marks	CO	PO
Q 1	a	Describe the Spiral process model used for software development and discuss its strengths and weaknesses.	5	1,4,5	a,d
	b	What is a Process Framework? Explain in detail the Generic Framework Activities?	5	1,2,3	c,d,e
		OR			
Q1		For each of the following projects, state (a) What generic software process model you would employ and (b) what features of the project are best suited to the chosen model. (i) An online Call Routing Management (CRM) software module that provides both routing and voice fidelity capabilities to a voice network exchange centre. (ii) An Air-traffic Message Handling System (AMHS) which provides air traffic controllers at an airport with message exchanges from arriving and departing aircrafts. (iii) A navigation and control software module for driverless hybrid electric vehicles.	10	1,2,3,4,5	a,b,c,d,e
Q2	a	Applying decomposition develop three levels of DFDs for online food ordering system.	5	3,4	c,d
	b	What are DFDs? Explain various components used in developing the DFD of a given system with the help of an example.	5	1,2	a,b,c,f

SECTION-B

Q 3	a	Calculate FPA(Function Point Analysis) if all CAF(Complexity Adjustment Factor) are significant for the following count values EI=12, EO=34, EQ=46, EIF=14, ILF=22.	5	4,5	b,d ,g
	b	Develop below listed UML diagrams using the structural view of the banking system shown.	5	3,4 ,5	a,d ,g



a. Use Case diagram
b. Sequence Diagram
c. Activity diagram
d. Component diagram
e. Deployment diagram

Q 4	a	A software company needs to develop a project that is estimated as 1000 function points and is planning to use JAVA as the programming language whose approximate lines of code per function point is accepted as 50. Considering a=1.4, b=1.0, c=3.0, d=0.33 for basic COCOMO, estimate the duration to complete the project.	3	4,5	a,d ,g
	b	Describe following two testing types. a. Regression Testing b. Acceptance Testing	2	1	a,f
	c	Define Software Metrics. Describe three types of software metrics and explain any three outcomes of process which can be measured in order to improve the effectiveness of the process.	5	4,5	b,d ,g

COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra)

SHIVAJI NAGAR, PUNE – 411 005

T2 Examination

SUBJECT: Renewable energy (ILOE)

Class: Third year B.Tech **Max. Marks:** 20

Date:03/17/2023 **MIS No:**

Duration:1Hour

Instructions:

1. Except scientific (non-programmable) calculator, no electronic device is allowed.
2. Exchange of any material (pencil, pen, eraser etc.) is not allowed.
3. Figures to the right indicate full marks.
4. Write your MIS no on question paper.
5. All questions are compulsory.

Q (1)	Explain why we observe two bulges in ocean during high tide and why the time between two high tides is 12 hrs. 25 minutes?	(5)
Q (2)	Explain the concept of solar radiation absorption used for the heating of ocean water and how this is used for generating electricity? (Do not explain the OTEC cycles here). Explain the thermodynamic cycle in this question	(5)
Q (3)	Explain in detail the working and construction of Claudes' cycle.	(5)
Q(4)	Consider a tidal power plant having basing area of 50×10^8 m^2. The range of tide is 18m. A double purpose turbine has been installed in the plant which can work only when the height of the tide is more than 4 m. Find out the energy generated by the plant in a day during high tides? Consider the turbine efficiency 0.65.	(5)

MIS Number | 1 | 1 | 2 | 0 | 0 | 3 | 1 | 0 |

COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

T2 –20th March, 2023

Dept. Elective-1 System Programming.

Class: - T.Y.B.Tech (Div-1 and Div-2)

Year: - 2022-23 **Semester: - VI**

Duration: - 1 hr **Max. Marks: - 20**

Instructions:

1. *All the Questions are compulsory.*
2. *Assume suitable data whenever necessary.*
3. *Draw neat figures wherever required*
4. *Figures to right indicate full marks*

Q.1. How Procedures are handled by 8080 Assembler 04

Q. 2 Write down the detail of compile/Assemble Go Loader What are Advantage and disadvantages 05

Q 3. What arc thc difference between Linker and Loader 03

Q 4. Give an example of an error to be caught and handled at the following stages of program development 04

1. Link Time
2. Load Time
3. Execution Time
4. None of the above and still an errror

Q 5. Explain 04

1. Bootstrap Loader
2. Overlay srructures
3. Transfer Vector
4. Relocation Bits representation pros and cons

END.

COLLEGE OF ENGINEERING, PUNE
(An Autonomous Institute of Government of Maharashtra.)
Department of Computer and Information Technology

Subject: Design and analysis of algorithms | **Test 2** | **Class: TYCE**
Duration: 1hr | **AY 22-23** | **Date: 18/ 03/2023**

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1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of stationery, calculator etc. not allowed.
5. Write your MIS Number on Question Paper

Q.1 Choose appropriate option/s for following. Justify the answer in one or two lines.

1. Which one of the following is the recursive function for finding out longest common subsequence of two different strings, by using dynamic programming approach? If C[i,j] is the cell value from one string to other string. 1

a)
$$c[i,j] = \begin{cases} 0 & \text{if } i,j = 0 \\ c[i-1, j-1] + 1 & \text{if } x_i = y_j \\ \max(c[i-1, j-1], c[i-1, j-1]) & \text{if } x_i \neq y_j \end{cases}$$

b)
$$c[i,j] = \begin{cases} 0 & \text{if } i,j = 0 \\ c[i-1, j-1] + 1 & \text{if } x_i = y_j \\ \max(c[i, j-1], c[i-1, j]) & \text{if } x_i \neq y_j \end{cases}$$

c)
$$c[i,j] = \begin{cases} 0 & \text{if } i,j = 0 \\ c[i, j-1] + c[i-1, j] & \text{if } x_i = y_j \\ \max(c[i, j-1], c[i-1, j]) & \text{if } x_i \neq y_j \end{cases}$$

d) None of these

2. A partially filled table corresponding to a prefix function as L[i] values for a pattern p=ttrrttt is given below. Assume the stating index of pattern is 1 (that is P[1....7]=ttrrttt]. Find the remaining entries in the table. 2

i	1	2	3	4	5	6	7
P[i]	t	t	r	r	t	t	t
L[i]	0	1	0				

a) 1,2,3,4
b) 0,1,2,3
c) 0,1,2,0
d) None of these

3. Working modulo q=11, how many spurious hits (that is , you incorrectly guess that there is a pattern starting at a position) does the rabin-karp matcher encounter in the text T= 31415926535 when looking for a pattern p=26? 2

a) 2
b) 3
c) 5
d) None of these

Q.2 Match the pair/s of worst case time complexity only for string matching for algorithms mantioned in column A with column B, as per our learning in class. Consider m is the length of pattern and n is the length of the text 2

Column A	Column B
a) Naive 2	i. O(n)
b) Rabin Karp 3	ii. O(n.m)
c) Finite State Automata 4	iii. O(n+m)
d) Knuth-Morris-Pratt 1	iv. O(m)
	v. None of these

Q.3 Write the answers for the following

(A1A2)((A3A4)A5) 1896

1. Solve the following matrix chain multiplication problem to get minimum scalar multiplications as an optimal solution also calculates the optimal parenthesizing using dynamic programming approach. Given, n is no. of matrices are 5, dimensions set for all 5 matrices as $r = \{r_0, r_1, r_2, r_3, r_4, r_5\} = \{8,3,2,19,18,7\}$. 6

2. For a given pair of intergers (a,b) Euclid's extended algorithm finds the triplet (d,x,y) such that d is the GCD of (a,b) and d= ax+by. Compute the values (d,x,y) that the extended euclid's algorithm will return for the pair (891, 702) 3

3. Consider the following adjacency matrix for a directed graph G. Draw the graph from the given matrix and solve the problem to get the shortest distance among all pairs of vertices in the graph. Show step by step matrix representation using appropriate dynamic programming algorithm. 4

0	4	∞	3
∞	0	2	1
5	3	0	∞
1	∞	2	0

------*----All The Best-----*-----