



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal-500043, Hyderabad

B.Tech VI SEMESTER END EXAMINATIONS (REGULAR) - JULY 2023

Regulation: UG-20

GO PROGRAMMING

(COMMON TO CSE | CSE(AI&ML) | CSE(DS) | CSE(CS) | CSIT | IT)

Time: 3 Hours

Max Marks: 70

Answer ALL questions in Module I and II

Answer ONE out of two questions in Modules III, IV and V

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

MODULE – I

1. (a) Explain the steps involved in installing Go programming language on a windows operating system.
[BL: Understand| CO: 1|Marks: 7]
- (b) Write a Go program that calculates the area and circumference of a circle. Use constants to define the value of Pi and utilize appropriate identifiers for variables and functions.
[BL: Apply| CO: 1|Marks: 7]

MODULE – II

2. (a) Develop a function that takes a string as a parameter and checks if it is a palindrome. The function should return a boolean value indicating whether the string is a palindrome or not.
[BL: Understand| CO: 2|Marks: 7]
- (b) Create a program that prompts the user to enter a positive integer 'n'. Print a pattern consisting of 'n' rows, where each row contains a series of numbers from 1 to 'n'. The numbers should be printed in ascending order for odd-numbered rows and in descending order for even-numbered rows. Use control structures, such as loops and if-else statements, to determine the order of numbers in each row.
[BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) Outline about transpose matrix that takes a 2D array (matrix) as a parameter and returns a new matrix that is the transpose of the original matrix. The transpose of a matrix swaps its rows with columns.
[BL: Understand| CO: 3|Marks: 7]
- (b) Create a program that calculates the final grades for a class of students based on their individual scores and a set of grading criteria. The program should prompt the user to enter the number of students, as well as the weightage (in percentage) for each component of the grade: assignments, quizzes, and exams. The program should then ask for the scores of each student for each component and calculate their final grades. The grading criteria are as follows:
Assignments: 30%
Quizzes: 20%
Exams: 50%
Note : Use a combination of loops and arrays to collect the scores for each student and calculate their final grades.
[BL: Apply| CO: 3|Marks: 7]

4. (a) Write a program that declares and initializes a map of string keys and integer values. Sort the map by its keys in ascending order and print the sorted map. [BL: Understand| CO: 4|Marks: 7]
- (b) Develop a program that prompts the user to enter a sentence. The program should then count the frequency of each word in the sentence and store the result in a map. Finally, print the word frequencies. [BL: Apply| CO: 4|Marks: 7]

MODULE – IV

5. (a) How does the map structure in Go provide efficient lookup and retrieval operations compared to other data structures? Explain. [BL: Understand| CO: 5|Marks: 7]
- (b) Write a Go function that takes a password as input and checks its strength based on the following criteria: At least 8 characters long contains at least one uppercase letter contains at least one lowercase letter contains at least one digit Contains at least one special character (e.g., !, @, #, \$) [BL: Apply| CO: 5|Marks: 7]
6. (a) Summarize the following terms
- i) Go install [BL: Understand| CO: 5|Marks: 7]
- ii) Go test [BL: Understand| CO: 5|Marks: 7]
- (b) Create a custom package that includes functions to calculate the grade of a student based on their marks. The package should have a function to calculate the average, and another function to determine the grade based on the average. Use this package in a Go program that takes input for multiple students' marks and prints their average and grade. [BL: Apply| CO: 5|Marks: 7]

MODULE – V

7. (a) What are universal methods in Go? How do you choose between value receivers and pointer receivers when defining methods in Go? [BL: Understand| CO: 6|Marks: 7]
- (b) Implement a system for managing employees in a company. Each employee can have multiple roles and responsibilities. Some employees are managers, some are engineers, and some are both. Define an interface that allows employees to have multiple roles and responsibilities, and provide functions to perform specific actions based on the employee's roles. [BL: Apply| CO: 6|Marks: 7]
8. (a) How do you define and implement an interface in Go? What are the syntax and rules for interface declaration? [BL: Understand| CO: 6|Marks: 7]
- (b) Design a system to manage a library's collection of books. The system should allow library staff to perform various operations on the books, such as adding new books, searching for books by title or author, and borrowing/returning books. Design a solution using method sets and interfaces to handle different types of library users with different privileges. [BL: Apply| CO: 6|Marks: 7]

