CIT425 - Operations Research

COURSE UNIT: 3

Instruction: Answer Question 1 and any other three questions   Time   Allowed: 2   ¾ hours

Question 1:
  a. List and briefly explain the main characteristics of Operations Research.   *8 marks*
  b. (i) Define an optimization problem   *3marks*
      (ii) State three areas of application of linear programming.   *3 marks*
  c. Describe dynamic programming and its key features   *6 marks*
  d. Define the transportation problem and explain its main objective.   **5 marks**

Question 2:
Create a flow chart detailing the stages involved in the application of Operations Research to solve a management problem. Explain the various stages.   **15 marks.**

Question 3:
Using graphical method of linear programming, maximize: R = 4x + 5y subject to the following constraints:
$2x + 5y \leq 25$,
$6x + 5y \leq 45$,
$x \geq 0, y \geq 0$ **15 marks**

Question 4:
Critique the effectiveness of the dynamic programming approach in solving real-world planning problems. Provide examples to support your arguments.   *15 marks*

Question 5:
Discuss the three methods of solving transportation problems.   **15 marks**

Question 6:
Evaluate the statement: *"The assignment problem can always be solved most efficiently by its own unique method rather than the transportation methods."* consider the efficiency, complexity, and applicability of different methods for solving the assignment problem in your discussion.   **15 marks**