

<p>Operations Research (OR), which is a very powerful tool for</p> <p>Ans: Decision Making.</p> <p>2. Who coined the term Operations Research?</p> <p>Ans: J.F.McCloskey and F.N. Trefethen.</p> <p>3. Who defined Operations Research as scientific method of providing executive departments with a quantitative basis for decisions regarding the operations under their control?</p> <p>Ans: Morse and Kimball</p> <p>4. Which technique is used in finding a solution for optimizing a given objective, such as profit maximization or cost minimization under certain constraints?</p> <p>Ans: Linear programming</p> <p>5. Define Operations Research?</p> <p>Ans: Operations research (OR) is an analytical method of problem-solving and decision-making that is useful in the management of organizations. In operations research, problems are broken down into basic components and then solved in defined steps by mathematical analysis.</p> <p>(2 Mark Questions)</p> <p>6. Cite any two limitations of Operations Research?</p> <p>Ans: Costly : Operations Research (OR) is very costly. This is because OR makes mathematical models for taking decisions and solving problems. The company has to make various models for solving different problems. All this increments the cost. Not Realistic: OR experts make very complex models for solving problems. These models may not be realistic. Hence, they may not be useful for real-life situations.Complex : OR is very complex concept. It is very difficult for an average manager to understand.</p> <p>7. Cite the uses of Operations Research?</p> <p>Ans:</p> <ul style="list-style-type: none"> • Scheduling and time management. • Urban and agricultural planning.. • Enterprise resource planning (ERP) and supply chain management(SCM). • Inventory management in Organizations. • Network optimization and engineering. • Packet routing optimization. • Risk management <p>(4 Mark /Short Essay Questions)</p> <p>8. What are the advantages of Operations Research?</p> <p>Ans: Enhanced productivity.</p> <p>Operations research helps in improving the productivity of the organizations</p> <ul style="list-style-type: none"> • Linear programming. Management is responsible for making important decisions about the organization. • Improved coordination. • Lower risks of failure. • Control on the system. <p>9. What are the main characteristics of Operations research techniques?</p> <p>Ans:Some significant characteristics or features of OR are given below:</p> <ul style="list-style-type: none"> . Decision Making: a major premise of OR is that decision making, irrespective of the situation involved, can be considered as a general systematic process. OR improves the quality of decisions. . Scientific Approach: OR applies scientific methods for the purpose of analysis and solution of the complex problems. It is a formalized process of reasoning. In this approach there is no place for guess work and the person bias of the decision maker. . Objective-Oriented Approach: OR attempts to locate the best or optimal solution to the problem under consideration. OR tries to find the best (optimum) decisions relative to largest possible portion of the total organization. . Inter-disciplinary team Approach: OR is the inter-disciplinary in nature and requires a team approach to a solution of the problem. Managerial problems have economic, physical, biological and engineering aspects. This requires a blend of people with expertise in the areas of mathematics, statistics, engineering, economics, management, computer science and so on. . Imperfection of solutions: By OR techniques, we cannot obtain perfect answers to our problems but, only quality of the solution is improved from worse to bad answers . Use of Digital Computer: The models of OR need lot of computation and therefore, the use of computers becomes necessary. With the use of computers it is possible to handle complex problems requiring large amount of calculations. . Optimize the total output: OR tries to optimize the total output by maximizing the profit and minimizing the cost. <p>10. Explain the Phases of OR?</p> <p>Ans:a) Defining the problem and gathering data</p> <p>b) Formulating a mathematical model</p> <p>c) Deriving solutions from the model</p> <p>d) Testing the model and its solutions</p> <p>e) Preparing to apply the model</p> <p>f) Implementation</p>	<p>11. What are the OR Techniques?</p> <p>Ans:Probability: analyze uncertainties and bring out necessary data with reasonable accuracy for the purpose of decision making</p> <p>Linear Programming: This model is used for resource allocation when the resources are limited and there are number of competing candidates for the use of resources.</p> <p>Decision theory: OR technique of Decision theory is applied to select best alternative course of action</p> <p>Game theory: Game theory helps to determine the best course of action for a firm in view of the expected counter</p> <p>11. What is linear programming problem?</p> <p>A: A linear programming problem consists of a linear function to be maximized or minimized subject to certain constraints in the form of linear equations or inequalities.</p> <p>12. Define feasible solution ? Optimal solution?</p> <p>A:A nonnegative vector of variables that satisfies the constraints of (P) is called a feasible solution to the linear programming problem. A nonnegative vector of variables that satisfies the constraints of (P) is called a feasible solution to the linear programming problem. A feasible solution that minimizes the objective function is called an optimal solution. A nonnegative vector of variables that satisfies the constraints of (P) is called a feasible solution to the linear programming problem. A feasible solution that minimizes the objective function is called an optimal solution.</p> <p>13. Define slack surplus and artificial variables in LPP.</p> <p>Ans: Slack variable: It is used to convert a Less than or equal to (S) constraint into equality to write standard form. It is ADDED to constraint.Surplus & Artificial variables: They are used to convert Greater than or equal to constraint into equality to write standard form.</p> <p>14. What are the advantages of LPP?</p> <p>Ans: LP makes logical thinking and provides better insight into business problems. Manager can select the best solution with the help of LP by evaluating the cost and profit of various alternatives.</p> <p>LP provides an information base for optimum allocation of scarce resources.LP assists in making adjustments according to changing conditions.</p> <p>LP helps in solving multi-dimensional problems.</p> <p>1. While Solving a transportation problem the occurrence of degeneracy means that Ans:the solution so obtained is not feasible.</p> <p>2. A transportation problem is said to be balance if Ans: total demand=total supply</p> <p>3. A feasible solution of a transportation problem involves exactly m+n-1 possible variables is known as</p> <p>Ans: Basic Feasible Solution.</p> <p>4. What is an unbalanced transportation problem?Ans: The problem of transporting a product from several factories (supply origins) to a number of warehouses (demand destinations) is generally considered as a very good application area for linear programming technique. When the total number of units available at the supply origins is equal to the total number of items available at the demand destinations, it is termed a balanced transportation problem. If these two values are not equal, it is termed an unbalanced problem.</p> <p>5. Explain transportation problem?</p> <p>Show that it can be considered as LPP.</p> <p>Ans: The Transportation Method of linear programming is applied to the problems related to the study of the efficient transportation routes i.e. how efficiently the product from different sources of production is transported to the different destinations, such as the total transportation cost minimum.</p> <p>1. Minimisation of objective function in LP means</p> <p>Ans: Least value chosen among the allowable decisions</p> <p>2. For maximization PP, the objective function coefficient for an artificial variable is :Ans: - M</p> <p>3. The dual of the Primal maximization PP having m constraints and n non negative variables Should:</p> <p>Ans: have n constraints and non negative variables.</p> <p>4. The variable that we seek to determine in a LPP are called</p> <p>Ans:Decision variables</p> <p>5. A basic solution to the system is degenerate if one or more-- vanishing Ans:variable</p> <p>6. The basic Solution in which non of the basic variable is zero is called.</p> <p>Ans: non degenerated</p> <p>7. A variable that is added to an inequality to transform it into equality :</p> <p>Ans: Slack variable</p>	<p>1. Define Assignment problem</p> <p>Assignment problem is a special PP which deals with assignment of workers to machines, clerks to various checkout counters, salesmen to different sales areas, service crews to different districts and so on. Thus in an assignment problem, the question is how the assignments should be made in order that the total cost involved is minimised.</p> <p>4. What is an unbalanced assignment problem?</p> <p>The Hungarian method of solving assignment problems require that the number of columns should be equal to the number of rows in which case the problem is known as balanced problem and when the rows and columns are unequal, it is called an unbalanced assignment problem. In case of such class of problems, one to one match is not possible.In such situations, dummy columns / rows, whichever is smaller in number are inserted with zeros as the cost elements. For example, in case of 4x5 cost matrix, a dummy row is added. In each column in respect of this row, a zero would be placed. After this process of adding dummy rows/ columns, the problem is solved in a usual manner.</p> <p>6. What is the Maximization Case of Assignment Problem?</p> <p>In some situations the assignment problem may call for maximization of profit, revenue etc. as the objective. For dealing with such problems, we first change it into an equivalent minimization problem. This is achieved by subtracting each of the elements of the given pay-off matrix from a constant value (say K). Usually the largest of all values in the given matrix is located and then each one of the values is subtracted from it. Then the problem is solved the same way as the minimisation problem.</p> <p>9. Which method is used for solving assignment problem?</p> <p>Ans:-Hungarian Method</p> <p>10.What is travelling salesman problem?</p> <p>The traveling salesman problem consists of a salesman and a set of cities.The salesman has to visit each one of the cities starting from a certain one (e.g. the hometown) and returning to the same city. The challenge of the problem is that the traveling salesman wants to minimize the total length of the trip.</p> <p>11.Define Sequencing problem.</p> <p>Ans. It is the selection of an appropriate order in which large number of jobs can be assigned to a finite number of machines to optimize the outputs in terms of time, cost or profit.</p> <p>12.Explain Network Analysis.</p> <p>Ans: Network Analysis is used to plan, monitor and control the projects to minimise cost, project time, optimum utilization of resources, avoiding delays.</p> <p>13.What is no passing rule in sequencing problem?</p> <p>Ans: No passing rule means that the passing is not allowed, i.e., the same order of jobs is maintained over each machine. If n jobs are to be processed through two machines A and B in the order AB, then this means that each job will go to machine A first and then to B.</p> <p>14.Define critical activity</p> <p>Ans: Critical Activity is referred to a specific schedule activity that is occurred to be an element of a critical path that happens to be placed within a project schedule. Critical activities are single-minded that helps in the process of implementation and utilization of the critical path method.</p> <p>15.Explain the procedure of problems with n jobs and two machines.</p> <p>Ans:</p> <p>Step 1: find the shortest processing time among jobs not yet scheduled.</p> <p>Step 2: if the shortest processing time is on machine 1, assign the job as early as possible.Otherwise assign it as late as possible (machine 2).</p> <p>Step 3: eliminate the last job scheduled.</p> <p>Step 4: repeat steps 1,2 until all jobs scheduled.</p> <p>5. Dual of a dual problem of a LPP is Ans:Primal.</p> <p>9. State the general linear programming problem in standard form?</p> <p>A: Standard form of LP must have following three characteristics:Objective function should be of maximisation type All the constraints should be of equality type All the decision variables should be nonnegative</p> <p>10. What is Role of pivot element in simplex table?</p> <p>A: To determine the leaving variable in from a feasible solution.</p> <p>16.Distinguish between PERT and CPM analysis.</p> <p>Ans:Project Evaluation and Review Technique (PERT)</p> <p>PERT is appropriate technique which is used for the projects where the time required or needed to complete different activities are not known. PERT is mostly applied for scheduling, organization and integration of different tasks within a project. It provides the blueprint of project and is efficient technique for project evaluation.</p> <p>Critical Path Method (CPM):</p> <p>CPM is a technique which is used for the projects where the time needed for completion of project is already known. It is majorly used for determining the approximate time within which a project can be completed. Critical path is the largest path in project management which always provide minimum time taken for completion of project.</p>
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