Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14 ME2054** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PRINCIPLES OF RESOURCES AND QUALITY MANAGEMENT** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | List things that to be maximized in an industry. | CO1 | 1 |
| b. | Define objective function and constrain in LPP. | CO1 | 1 |
| c. | How to introduce artificial variable in linear programming. | CO1 | 2 |
| d. | List any two applicaton of linear programming. | CO1 | 2 |
| e. | Solve the following Linear Programming problem by **simplex method.**  Maximise Z=X 1 –X2+3X3  Subjected to  2X1+X2+X3≤ 10  2X1- X3≤ 2  -2X1+2X2- 3X3 ≤ 0  X1,X2 and X3 ≥ 0 | CO1 | 14 |
| (OR) | | | | |
| 2. | a. | Name the three methods to arrive initial solution for transportation problem. | CO1 | 1 |
| b. | How to balance a transportation table? | CO1 | 1 |
| c. | What is the application of transportation problem? | CO1 | 2 |
| d. | How to resolve degeneracy in transportation problem? | CO1 | 2 |
| e. | A food manufacturing company has two plants T1 and T2 .Three fruit cultivators are willing to supply fruits in the following quantities. Cultivator C1 is willing to supply 190 Quintals at Rs 100/Quintal, Cultivator C2 is willing to supply 290 Quintals at Rs 90/Quintal, Cultivator C3 is willing to supply 390 Quintals at Rs 80/Quintal. Cost of transportation from  Cultivator to plants is given below   |  |  |  | | --- | --- | --- | |  | T1 | T2 | | C1 | 20 | 26 | | C2 | 9 | 16 | | C3 | 49 | 31 |     Plant capacities and labour costs are shown in the following table   |  |  |  | | --- | --- | --- | | Details | Plant T1 | Plant T2 | | Capacity in Quintal | 440 | 360 | | Labour cost in Rs/ Quintal | 30 | 22 |   The processed fruits are sold at Rs 480/Quintal to the distributors. The objective of the problem is to maximize profit, formulate the problem and find the initial solution by North-West corner method | CO1 | 14 |
| 3. | a. | Define loop network. | CO2 | 1 |
|  | b. | Why skip numbering is adopted in network? | CO2 | 1 |
|  | c. | Draw network and also find the critical path and duration for the following project   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Activities | 1-2 | 1-3 | 1-4 | 2-4 | 3-4 | | Duration  (Days) | 2 | 4 | 4 | 3 | 5 | | CO2 | 2 |
|  | d. | How to calculate variance and SD of a project? | CO2 | 2 |
|  | e. | The various time estimates of activities involved in a project are given below   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Activities | 1-2 | 1-3 | 2-4 | 2-3 | 3-4 | 3-5 | 4-6 | 5-6 | | Optimistic  Time  (Days) | 2 | 4 | 2 | 2 | 0 | 3 | 6 | 1 | | Normal  Time  (Days) | 6 | 8 | 3 | 4 | 0 | 6 | 10 | 3 | | Pessimistic  Time  (Days) | 10 | 12 | 4 | 6 | 0 | 9 | 14 | 5 |   i)draw the network and determine the expected completion time if the project-(4)  ii) Find the variance and SD of project (2)  iii) Determine the probability of completing the project within 23 days and 25 days (4)  iv) What is the probability that the project will be completed at least 5 days earlier than the expected time (4) | CO2 | 14 |
| (OR) | | | | |
| 4. | a. | Differentate direct cost and indirect cost. | CO2 | 1 |
|  | b. | Describe normal duration and crash duration. | CO2 | 1 |
|  | c. | Define ‘critical activity’ and ‘merge event’. | CO2 | 2 |
|  | d. | Draw a netwok with dummy activity and dangling. | CO2 | 2 |
|  | e. | Normal duration and normal cost crash cost and crash duration of the activities of a project are given below   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Activities | Normal Cost  (Rupees) | Normal  Duration(Days) | Crash  Cost  (Rupees) | Crash  Duration  (Days) | | 1-2 | 360 | 3 | 440 | 1 | | 2-3 | 240 | 4 | 320 | 2 | | 2-4 | 100 | 7 | 140 | 3 | | 3-4 | 80 | 5 | 140 | 2 |   Indirect cost is Rs 45/day. Find the optimal schedule by Critical Path Method | CO2 | 14 |
| 5. | a. | Give one example for a) Finite population size ii) Infinite population size | CO2 | 1 |
|  | b. | How to describe scheduled arrival? | CO2 | 1 |
|  | c. | Write notes on FCFS,SBP in queuing. | CO2 | 2 |
|  | d. | Differentate arrival rate and inter arrival time. | CO2 | 2 |
|  | e. | In a big textile mill, trucks loaded with raw cotton arrive at a rate of of 12 trucks per day. Assuming that the inter arrival time follows an exponential distribution and the service time distribution is also exponential with an average 34 minutes. Determine the following:  i) Mean line length ii) Probability that the queue size exceeds 12 | CO2 | 14 |
| (OR) | | | | |
| 6. | a. | Solve the following game by saddle point  Player B       |  |  |  |  | | --- | --- | --- | --- | | -5 | 2 | 0 | 7 | | 5 | 6 | 4 | 8 | | 4 | 0 | 2 | -3 |   Player A | CO2 | 1 |
|  | b. | Define ‘pay off matrix’. | CO2 | 1 |
|  | c. | Solve the following game by arithmetic method  Player B   |  |  | | --- | --- | | 4 | 0 | | 0 | 8 |   Player A | CO2 | 2 |
|  | d. | List the applications of game theory. | CO2 | 2 |
|  | e. | Solve the following game whose pay off matrix is given below by **concept of dominance**  **Player A**   |  |  |  | | --- | --- | --- | | 0 | -2 | 7 | | 2 | 5 | 6 | | 3 | -3 | 8 |     **Player B** | CO2 | 14 |
| 7. | a. | How to measure quality? | CO3 | 1 |
|  | b. | Differentiate internal failure cost and external failure cost. | CO3 | 1 |
|  | c. | List the use of control charts. | CO3 | 2 |
|  | d. | Draw cause and Effect diagram. | CO3 | 2 |
|  | e. | Discuss the bench marking process with suitable diagrams. | CO3 | 14 |
| (OR) | | | | |
| 8. | a. | Define Total Quality Management. | CO3 | 1 |
|  | b. | Name the three types of gaps in bench marking. | CO3 | 1 |
|  | c. | What is the use of quality function deployment? | CO3 | 2 |
|  | d. | List the 5 S technique in tools management. | CO3 | 2 |
|  | e. | Explain the 14 principles of Deming on TQM implementation. | CO3 | 14 |
|  | | **Compulsory**: |  |  |
| 9. | a. | ISO 14000 deals with \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO3 | 1 |
|  | b. | PDCA cycle stads for \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO3 | 1 |
|  | c. | Draw the documentation pyramid of ISO certification procedure. | CO3 | 2 |
|  | d. | Writ a note on quality audit. | CO3 | 2 |
|  | e. | Explain the ISO quality management implementation procedure. | CO3 | 14 |

ALL THE BEST