

Questions for practice EM-IV:

- 1) Find Z-Transform of $f(k) = \sin\left[\frac{k\pi}{4} + a\right], k \geq 0$.
- 2) Find Z-Transform of $f(k) = (k+1)\alpha^k, k \geq 0$.
- 3) Find Z-Transform of $f(k) = k^2\alpha^{k-1}, k \geq 0$.
- 4) Find $Z\{f(k) * g(k)\}$ if $f(k) = 4^k.U(k)$ & $g(k) = 6^k.U(k), k \geq 0$.
- 5) Find $Z\{f(k) * g(k)\}$ if $f(k) = \frac{1}{5^k}$ & $g(k) = \frac{1}{7^k}, k \geq 0$.
- 6) Find inverse Z-Transform of $F(Z) = \frac{z+2}{z^2-2z+1}$ if ROC is $|z| > 1$.
- 7) Find inverse Z-Transform of $F(Z) = \frac{1}{(z-3)(z-2)}$ if ROC is
 - i) $|z| < 2$ ii) $2 < |z| < 3$ iii) $|z| > 3$.
- 8) Solve the following LPP by Simplex method.
 - i) Maximise, $Z = 3x_1 + 2x_2 + 5x_3$
 Subject to, $x_1 + 2x_2 + x_3 \leq 430$
 $3x_1 + 2x_3 \leq 460$
 $x_1 + 4x_2 \leq 420$
 $x_1, x_2, x_3 \geq 0$.
 - ii) Minimise, $Z = x_1 - 3x_2 + x_3$
 Subject to, $3x_1 - x_2 + 2x_3 \leq 7$
 $2x_1 + 4x_2 \geq -12$
 $-4x_1 + 3x_2 + 8x_3 \leq 10$
 $x_1, x_2, x_3 \geq 0$.

9) Obtain the dual of following LPP.

- i) Minimise, $Z = x_1 - 3x_2 - 2x_3$
 Subject to, $3x_1 - x_2 + 2x_3 \leq 7$
 $2x_1 - 4x_2 \geq 12$
 $-4x_1 + 3x_2 + 8x_3 = 10$
 $x_1, x_2 \geq 0, x_3$ is unrestricted.

- ii) Maximise, $Z = 4x_1 - 5x_2 + 3x_3$
 Subject to, $7x_1 - 2x_2 + x_3 \geq 4$
 $3x_1 + x_3 \leq 10$
 $x_1 + x_2 + 3x_3 = 25$
 $x_1, x_3 \geq 0, x_2$ is unrestricted.

10) Solve the following LPP by Penalty method.

- Maximise, $Z = 6x_1 + 4x_2$
 Subject to, $2x_1 + 3x_2 \leq 30$
 $3x_1 + 2x_2 \leq 24$
 $x_1 + x_2 \geq 3$
 $x_1, x_2 \geq 0$.

11) Solve the following LPP by Dual Simplex Method.

$$\text{Minimise, } Z = 6x_1 + x_2$$

$$\text{Subject to, } 2x_1 + x_2 \geq 3$$

$$x_1 - x_2 \geq 0$$

$$x_1, x_2 \geq 0.$$

12) Solve the following NLPP.

$$\text{Optimise } z = 12x_1 + 8x_2 + 6x_3 - x_1^2 - x_2^2 - x_3^2 - 23$$

$$\text{Subject to, } x_1 + x_2 + x_3 = 10$$

$$x_1, x_2, x_3 \geq 0.$$

13) Solve the following NLPP.

$$\text{Optimise } z = 4x_1 + 9x_2 - x_1^2 - x_2^2$$

$$\text{Subject to, } 4x_1 + 3x_2 = 15$$

$$3x_1 + 5x_2 = 14$$

$$x_1, x_2 \geq 0.$$

14) Solve the following NLPP using Kuhn-Tucker method.

$$\text{Maximise } z = 10x_1 + 4x_2 - 2x_1^2 - x_2^2$$

$$\text{Subject to, } 2x_1 + x_2 \leq 5$$

$$x_1, x_2 \geq 0.$$

15) Solve the following NLPP using Kuhn-Tucker method.

$$\text{Maximise } z = 2x_1^2 - 7x_2^2 - 16x_1 + 2x_2 + 12x_1x_2 + 7$$

$$\text{Subject to, } 2x_1 + 5x_2 \leq 105.$$

$$x_1, x_2 \geq 0.$$

16) In an experiment on immunization of cattle from Tuberculosis the following results were obtained

	Affected	Not affected	Total
Inoculated	267	27	294
Not Inoculated	757	155	912
Total	1024	182	1206

Use Chi-Square test to examine the efficiency of vaccine in preventing tuberculosis.

17) If two independent random samples of sizes 15 & 8 have respectively the means 980 & 1012 population S.D. 75 & 80. Test the hypothesis that $\mu_1 = \mu_2$ at 5% Level of significance.

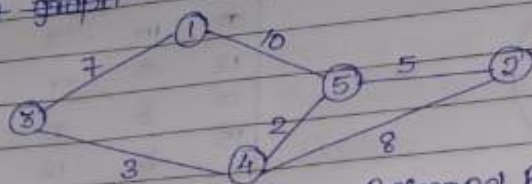
18) Ten individuals are chosen at random from a population & their heights are found to be 63, 64, 65, 66, 69, 69, 70, 70, 71 inches. Discuss the suggestion that the mean height of universe is 65 inches.

AOA Question Bank

Ques 1.

Ques 2.

Short Note of multistage graph. Problem on multistage graph. (Theory or Numerical Questions)

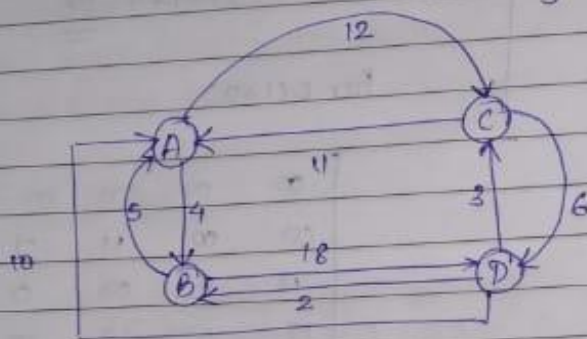


find the minimum cost using Bellman Ford Algorithm (single source shortest path).

Ques 3.

Define 0/1 Knapsack Problem using Dynamic Programming (Theory or Numericals) (10 marks)

Ques 4.



TSP problem solve using Branch & Bound.

Ques 5.

Longest Common Subsequence Problem -

①

$x = ACBAED$

$y = ABCABE$

②

$x = abcdaf$

$y = acbcf$

③

$x = ABACABB$

$y = BABCBAB$

Ques 5. Sum of subset Problem-

→ $W = \{5, 7, 10, 12, 15, 18, 20\}$ $m = 35$

→ $W = \{20, 18, 15, 12, 10, 7, 5\}$ $m = 35$

→ $W = \{15, 7, 20, 5, 18, 10, 12\}$ $m = 35$

→ $W = \{2, 7, 18, 9, 15\}$ $m = 17$

Ques 6. Shortt What is N-queen problem? What technique we can use to solve N-queen problem.

Ques 7. Explain general method of Branch and Bound.

Ques 8. Shortt Note → String Matching Algorithm

1. KMP

2. Rabin Karp

Ques 9. Shortt Note → 15 Puzzle Problem.

QB

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4 Marks.

(Any 2)

- Q1 1. Explain File Access Method
(8M) 2. File allocation Method
3. Directory Structure
4. File Operation
5. Short Note → File Sharing

Q2 1. Memory Management based (Theory Question) (any 2).

- ↳ paging
- ↳ segmentation
- ↳ thrashing EN ✓
- ↳ demand paging EN

2. Sum for Best Fit, Worst Fit and First Fit

3. Page Replacement Algorithm Sum (8 Marks)

Q3

1. Scheduling Sums

(16 Marks)

Microprocessor

Question Bank

- 1) Draw & explain block diagram of 8259
 - 2) ——— " ——— " ——— " 8257
 - 3) Architecture of 8255 along with its mode.
 - 4) Architecture of 80386
 - 5) Modes of 80386 (Real, protected, virtual)
 - 6) Control registers & flags of 80386
 - 7) Memory management unit of 80386
 - 8) Integer and floating point pipeline stages.
 - 9) Discuss cache organization of in pentium processor.
 - 10) Compare 8086, 80386, pentium 5 processor (tabular)
 - 11) Explain hyperthreading and its use in pentium 4
 - 12) Explain branch prediction in pentium 4.
 - 13) Explain instruction translation look-aside buffer in pentium 4.
- * Numerical question (similar to asgn).