F.Y. B.Com (Sem-I) A-I.R.I Exam

Time : 2 ½ hours SUB : Maths. Marks:75

Note:

1) Use of simple calculator is allowed.

2) Answer to the both sections should be written separately in the same answer book.

## SECTION-I

**Q-1 Attempt any Three:** [15]

[A]Dhvani invested Rs. 19,890 to purchase share of a company with face value of Rs. 10 each, at market price of Rs. 130. She received dividend of 20% as well. Afterward, she sold these shares at market price of Rs.180.She had to pay brokerage of 2% for both purchase and sales of share. Find her net profit.

[B]Manisha invested in systematic investment plan of a M.F., a fixed sum of Rs. 20,000/- on 2nd of every month, for 5 months. The NAV on these dates were Rs.53.12,56.26.48.86.50.44 and 54.62. Entry load was 2.25% throughout the period. Find the average price, including the entry load, using the Rupee-Cost-Averaging Method. How does it compare with the A.M. of the prices?

[C] The market value of 10 Rs. face value shares is 12.50 Rs. What is the number of share purchased by Miss. XYZ if she intent to invest Rs. 12625. The rate of brokerage is 1%.

[D] Anju invested Rs. 12000/- on 10th August, 2008 at NAV of Rs.43.378.Afterward he redeemed all his units on 27th October, 2008, with total gain of Rs.875.15. If the entry load was 2.25% and exit load was 1%, Find NAV on 27th October, 2008.

**Q-2 Attempt any Three:** [15]

**[A] Formulate the following L.P.P. to maximise the profit:**

An automobile manufacturer makes cars and Trucks in a factory that is divided into shops A & B. Shop A performs basic assembly operations and must work for 5 man days on each Truck and 2 man days on each car. Shop B performs finishing operations and has to work for 3 man days on a Truck and 3 man days on a car. Availability of man days per week is 180 in shop A & 135 in shop B. Manufacturer makes a profit of Rs.25,000/- on each truck and Rs. 20,000/- on each car.

[B]Solve the following L.P.P. Graphically:

Minimize $z = 12x + 18y$ subject to, $4x + y \geq 4$, $x + 3y \geq 6$, $x \geq 0$, $y \geq 0$

[C] In how many ways can 5 men, 4 women and 3 children be arranged for photographs so that all men are together and so are all women and children.

[D] How many four digits numbers can be made by using the digits 1, 2, 3 and 4? When (i) repetition is allowed and (ii) repetition is not allowed.

## SECTION-II

**Q-3 Attempt any Three:** [15]

[A]Calculate Median for the following distribution.

| Daily profit ( inRs.) | 100-140 | 140-180 | 180-220 | 220-240 | 240-260 |
|---|---|---|---|---|---|
| No. of Shops | 14 | 45 | 52 | 32 | 23 |

(P.T.O.)

[B] The average wage for 50 male workers is Rs.63/- & the average wage for 40 female workers is Rs.54/- in a factory. Find the combined average for all the workers in the factory.

[C] Calculate the quartile deviation for the following distribution giving exports of 100 companies. Also find relative measure.

| Exports (in lakhs of Rs.) : | 0-30 | 30-60 | 60-90 | 90-120 | 120-150 | 150-180 |
|---|---|---|---|---|---|---|
| No. of Companies : | 8 | 15 | 25 | 32 | 16 | 4 |

[D] Calculate Mean and mode for the following distribution.

| Daily profit (in Rs.) | 100-140 | 140-180 | 180-200 | 200-220 | 220-240 |
|---|---|---|---|---|---|
| No. of Shops | 14 | 45 | 82 | 52 | 32 |

**Q-4 Attempt any Three:** [15]

[A]The probability that A will be alive 30 year hence is 0.3 and that B will be alive 30 years hence is 0.4 what is the probability that (a) only A will be alive (b) at least one of them will be alive?

[B] In a game of throwing a fair dice, A wins Rs.60/- if a 6 is thrown. He gains Rs.30/- if the dice show 2 or 4 and he loses Rs.30/- if odd numbers occurs on the uppermost face of the dice. Find the expected gain of A?

[C]A room has 3 lamps. From a collection of 10 light bulbs of which 6 are not good, a person select 3 at random and puts them in the sockets. What is the probability that he will have light from all the three lamps?

[D]For the following probability distribution, obtain E(X) and V(X)

| X | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| P(X) | 0.1 | 0.2 | 0.2 | 0.3 | 0.15 | 0.05 |

**Q-5 Attempt any Three:** [15]

[A]A manager has to make a decision. He has four courses of actions $A_1$, $A_2$, $A_3$, $A_4$. There are four possible states of nature $S_1$, $S_2$, $S_3$, $S_4$ with probabilities of occurrence 0.4,.0.3,0.2,0.1 respectively.

| States of Nature | Course of Action | | | | Probability |
|---|---|---|---|---|---|
| | $A_1$ | $A_2$ | $A_3$ | $A_4$ | |
| $S_1$ | 15 | 1 | 8 | 9 | 0.4 |
| $S_2$ | 9 | 10 | 10 | 10 | 0.3 |
| $S_3$ | 6 | 8 | 10 | 11 | 0.2 |
| $S_4$ | 5 | 7 | 5 | 12 | 0.1 |

Draw a Decision Tree from the above Pay off Matrix and advise the manager as to the best action.

[B] A consumer goods company has set up the following pay off table for the sales returns of their product. Three strategies ($A_1$, $A_2$, $A_3$) are identifies to deal with three uncertain states of nature ($S_1$, $S_2$, $S_3$).You are required to identify right strategy under the following criteria:
(1)Maximin (2) Maximax (3) Laplace Criteria

| | $S_1$ | $S_2$ | $S_3$ |
|---|---|---|---|
| $A_1$ | 7,00,000 | 3,00,000 | 1,50,000 |
| $A_2$ | 5,00,000 | 4,50,000 | 0 |
| $A_3$ | 3,00,000 | 3,00,000 | 3,00,000 |

[C]The following table is pay off of four alternative plans under each of five possible states of nature. Obtain Minimax regret criterion

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|
| $A_1$ | 36 | 24 | 15 | 24 | 28 |
| $A_2$ | 36 | 24 | 34 | 40 | 30 |
| $A_3$ | 28 | 24 | 19 | 28 | 28 |
| $A_4$ | 32 | 24 | 19 | 28 | 30 |

[D] A bakery man has observed the following demand pattern for cakes produced in his bakery:

| No. of cakes in demand | 20 | 21 | 22 | 23 |
|---|---|---|---|---|
| Probability | 0.05 | 0.25 | 0.30 | 0.40 |

The cost of producing one cake is Rs.12/- and the selling price is Rs.20/-per cake. Use EMV criterion to determine how many cakes should produce so as to maximize his profit.

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