THE HONG KONG POLYTECHNIC UNIVERSITY

HONG KONG COMMUNITY COLLEGE

Subject Title : Introduction to Management Science

Subject Code : CCN2158

Session : Semester One, 2016/17

Numerical Answers

Question A1

Optimistic: 19; D1
Pessimistic: 13; D3
Maximum regret: 4; D4
Equally likely: 14.75; D1
Criterion of realism (α = 0.7): 16.6; D1

Question A2

(a) 66.67%
(b) 0.6667
(c) 10 minutes
(d) 0.9122
(e) 7 parking spaces

Question A3

(a) a=3,d=160,e=60,f=2.5
(b) b=3,c=3

Question A4

(b) $Y_1 = 0$, $Y_2 = 0$, $Y_3 = 0$ and $Y_4 = 9$ with optimal function value is 108.

Question A5

95 million dollars

Question A6

(a)2000
(b)320
(c)25
(d)$40,600

Question B1

(b) The optimal daily production for necklace, ring and bracelet are 0, 32 and 100 units respectively.
(c) The shadow price for gold is \$1.2727 with the range is [144, 540].
The shadow price for platinum is \$1.0909 with the range is [242.67, 910].
(d) The range of optimality for X_2 is [4, 15];the range of optimality for X_3 is [3.36, 12]; the range of insignificant for X_1 is less than 8.3636

Question B2

(a) The values for X_1 and X_2 are 33.33 and 16.67 respectively with the corresponding optimal function value is 166.67.
(b) The maximum profit is \$166 with the optimal solutions are $X_1 = 34$ and $X_2 = 16$.

Question B3

(d) expected time = 33; standard deviation = 3.873

(e) $P(X \le 40) = P\left(Z \le \dfrac{40-33}{3.873}\right) = P(Z \le 1.81) = 0.9649$

Question B4

(b) EMV(26) = \$22.5 is the maximum, the florist should stock 26 dozens of carnations.
(c) Since EOL(26) = \$3.1 is the minimum, 26 dozens of carnations should be stock.
(d) EVwPI = 20(0.05)+22(0.1)+24(0.25)+26(0.3)+28(0.2)+30(0.1) = **25.6**
EVPI = \$25.6 - \$22.5 = \$3.1