Workshop Lecture 2 Solution

1. Staple Limited

(a) Number of units that can be made with the idle hours = $\frac{8{,}000}{\cdot 5}$ = 16,000

Number of units that can be made with the dir material = $\frac{34{,}000}{2}$ = 17,000

(so all levels of output can be made)

(b) Relevant cost per unit:

			£
Direct material		2 kg @ 1.50	3.00
[Normal direct labour cost per hour = 8			
Idle time cost (80%)	6.40		
=> Incremental cost	1.60/hr]		
Direct labour per unit		·5x1.60 =	.80
Variable Overhead			2.00
Fixed Overhead – irrelevant			
			5.80

SP/unit	**£20**	**£30**	**£40**
	12x·4 = 4.8	9x·4 = 3.6	3x·4 = 1.2
	14x·5 = 7.0	10x·5= 5	7x·5 = 3.5
EV of demand in	15x·1 = 1.5	12x·1= 1.2	10x·1 = 1.0
Units (000)	13.3	9.8	5.7
Contribution per unit(£)	20-5.8 = 14.2	30-5.8 = 24.2	40-5.8=34.2
EV of contribution	13,300 x 14.2	9,800 x 24.2	5,700 x 34.2
=	£188,860	£237,160	£194,940
Incremental fixed cost	-	£12,000	£12,000
Expected value of project	£188,860	£225,160	£182,940

(c) The expected value is the notional weighted average of outcomes if the decision were able to be made many times – which is not of course the case. The range of individual outcomes, and their probabilities and management's attitude to risk will all matter. A schedule of each individual outcome with its associated probability would be helpful.

(d) Sensitivity analysis, simulation.

continued/…

2. Fruit Ltd

	Apple	Banana	Cherry
SP/unit	100	200	300
VC	40	150	220
Cont/unit	60	50	80
Av. F.Cost	£200,000	£220,000	£260,000

Expected value of volume (000s)

6x·2+8x·5+10x·3 6x·3+7x·+9x·5+9x·2	2x·3+12x·5+18x·2	
= 1.2+4+3	= ·6+6+3.6	= 1.8+3.5+1.8
= 8,200 units	= 10,200 units	= 7,100 units

⇨ EV of Cont

(units x 60) =	492,000	(units x 50) =	510,000	(units x 80) =	568,000
FC	200,000		220,000		260,000
EV of project =	292,000		290,000		308,000

(a) Cherry

(b)

prob	Banana	Cont/unit	Total Cont	F.Costs	"Profit"	Prob x profit
·3	2000 units	50	100,000	0(cancel)	0	0
·5	12000 units	50	600,000	220,000	380,000	190
·2	18000 units	50	900,000	220,000	680,000	136
						326

	£326,000
less research cost	15,000
Expected value of project	£311,000

(c) Project "Banana + Research" gives highest EV of profit BUT, as always, the range of individual outcomes, and their probabilities and management's attitude to risk will all matter.

"Banana + Research" constitutes a 4th option to be considered alongside the others.

All individual outcomes could be calculated in this example since there is a limited number. (But not necessarily in an exam – unless specifically required.)

Often a good idea to look at worst cases and their probabilities

Eg "Banana + Research" has a ·3 probability of a loss of £15,000.

What are the worst possible results of the other options?

Apple	£160,000	(.2)
Banana	(£120,000)	(.3)
Cherry	£220,000	(.3)