1)

(a)
(b)
(c)

Activity network nodes:

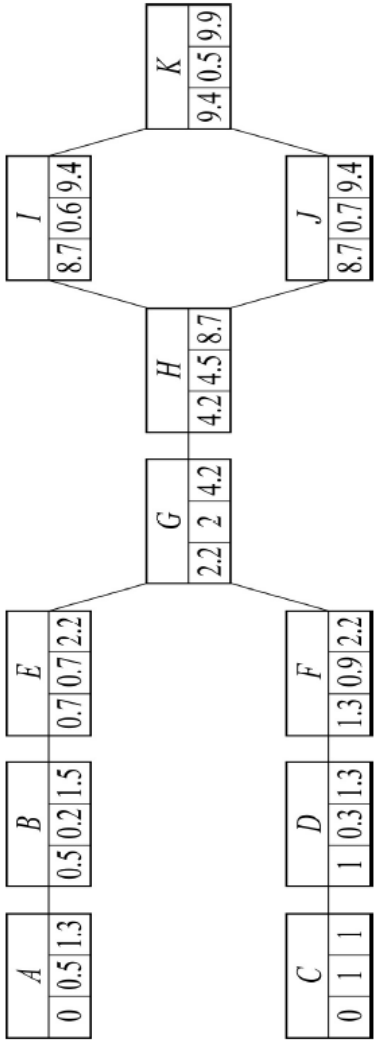| K | 9.4 | 0.5 | 9.9 |
I	8.7	0.6	9.4
J	8.7	0.7	9.4
H	4.2	4.5	8.7
G	2.2	2	4.2
E	0.7	0.7	2.2
F	1.3	0.9	2.2
B	0.5	0.2	1.5
D	1	0.3	1.3
A	0	0.5	1.3
C	0	1	1

M1 Network

A2,1,0

M1 Early

A1

M1 Late

A2,1,0 Ft on 1 mistake

(d) Critical C, D, F, G, H, J, K   B1
    Length = 9.9   B1F

⊛

Gantt chart (TOTAL):

K, J, I, H, G, F, E, D, C, B, A plotted against scale 0 to 10.

TOTAL

13

M1 SCA
m1 Floats
A1
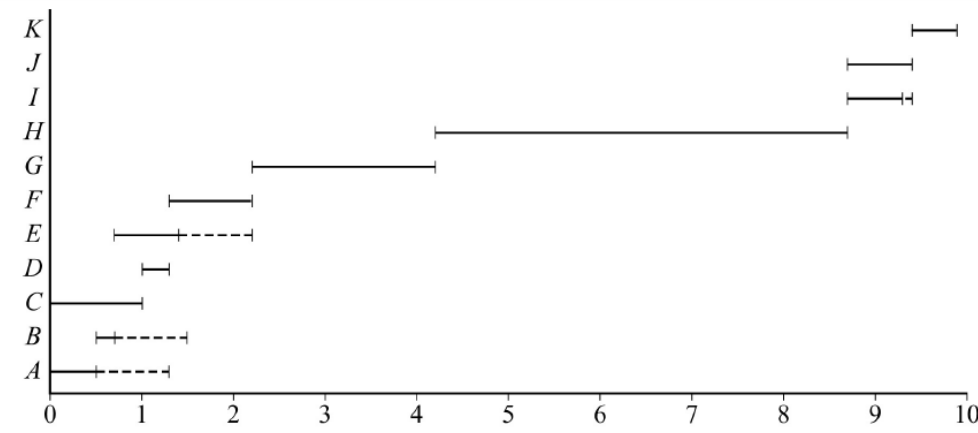
2) (a)(i) Table Method
(2- way with either R or C totals)

	A	A′	Total
E	0.55	0.05	0.60
E′	0.30	0.10	0.40
Total	0.85	0.15	1.00

B1   0.15 or 0.4; CAO; allow fractions
B1   0.05 and 0.3; CAO; allow fractions
Bdep1 3 0.1; AG so dependent on B1 B1
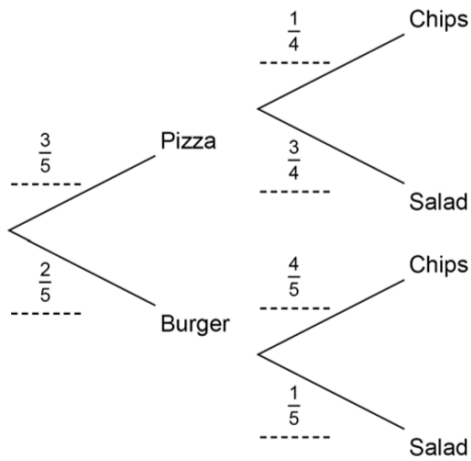
(ii) P(≥1) = 0.9 or 9/10   B1 1 CAO

(iii) P(1) = 0.3 + 0.05 = 1 − (0.55 + 0.10)
      = 0.35 or 35/100 or 7/20   B1 1 CAO

3) (a)

Tree diagram:
- Pizza ($\frac{3}{5}$) → Chips ($\frac{1}{4}$), Salad ($\frac{3}{4}$)
- Burger ($\frac{2}{5}$) → Chips ($\frac{4}{5}$), Salad ($\frac{1}{5}$)

All probabilities correctly filled in	B2	Accept equivalent fractions, decimals or percentages	
		B1 for any three probabilities correctly filled in	

(b)

Everyone has either chips or salad	B1	oe	
		Allow 'people don't have both chips and salad'	

(c)

their $\frac{3}{5} \times$ their $\frac{1}{4}$ or $\frac{3}{20}$ or their $\frac{2}{5} \times$ their $\frac{4}{5}$ or $\frac{8}{25}$	M2	oe
$\frac{47}{100}$	A1	oe

(d)

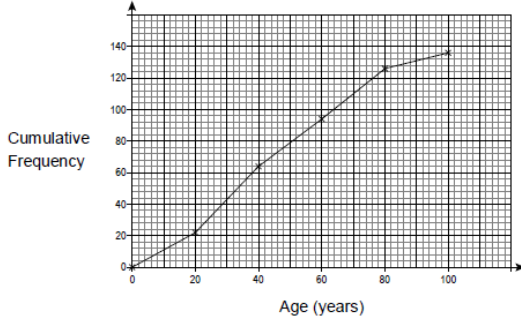|		
$(84 \div 240 =) \ 0.35$ or $(0.47 \times 240 =) \ 112.8$	B1	oe
Customers at Eastwich are less likely to choose chips than those at Southpool	B1	oe

4)

Working	Answer	Marks	Notes
Manufacture itself = $(0.2\times8000+0.5\times4000+0.3\times-2000) = 3000$ Take royalties = $(0.2\times5000+0.5\times3000+0.3\times1000) = 2800$ (Sell all rights = 2500) Best course of action is to manufacture itself.	Manufacture itself.	5	M1 One correct calculation shown in method for calculating expected value of one option e.g. 0.2×8000(000) M1 Complete method for Manufacture itself OR Take royalties M1 Complete method for both Manufacture itself AND Take royalties A1 Manufacture itself = 3000(000) AND Take royalties = 2800(000) C1ft (Dependent on M2). Correct choice based on their two calculated values and the given value for Sell all rights (may be implied)

5)

£2 051 000	4	M1 for 350 000 × 55 (=£19 250 000) M1 for 350 000 × 0.18 (= 63 000) M1 for "63 000" × 273 (= £17 199 000) A1 cao	Ex

6)

1 (a)					
	No MR or MC in this question				Ignore units throughout this question
(i)	Mode = **71**	B1			CAO; ignore any reference to 8
	Range = **9**	B1		2	CAO
Note	1 If answers are not identified, then assume that order of values is mode, range				
(ii)	Median = **70**	B1			CAO
	IQR = **3**	B2			CAO; providing not from incorrect working eg see Note 1
	UQ = **72** LQ = **69**	(B1)		3	Both values CAO; ignore labels
Notes	1 Ordering of weeks (1, 1, 2, 2, 2, 3, 4, 5, 7, 8) ⇒ median = 2.5 ⇒ B0 B0 even if IQR = 3 (5 – 2) 2 If answers are not identified, then assume that order of values is median, IQR				
(iii)	Mean = **70.4**	B2			CAO
	Mean = **70.1 to 70.7**	(B1)			AWFW; but exclude 70.5 unless with a **correct method** (see **Note 2**)
	SD = **2.03 or 2.06**	B2			Either AWRT (2.0312 or 2.0608)
	SD = **2 to 2.1**	(B1)		4	AWFW

7)

	Cumulative frequencies	B1		22, 64, 95, 126, 136	
	Plots at upper class limits	B1			
	Plots heights	B1 ft	4	Dep on increasing function	
	Joins points with lines or smooth curve and joins to (0, 0).	B1 ft		Dep on increasing function	
5(a)					

Cumulative Frequency vs Age (years)

5(b)(i)	Read off from their 68 (= 42)	B1ft	1	Ft their c.f. graph ± half a small square	
5(b)(ii)	Read off from their 34 (= 25 or 26) and their 102 (= 64)	M1ft	2	Ft their c.f. graph ± half a small square	
	38 or 39	A1ft		Ft their c.f. graph ± half a small square	
5(c) Alt 1	Use of Box and whisker diagram(s)				
	Plots their median	B1 ft		±½ small square	
	Correct interpretation of medians or point values	B1 ft	4	Ft any valid 'point' value.	
	Plots their quartiles (and completes the box)	B1 ft		±½ small square	
	Correct interpretation of IQRs	B1 ft			
	Use of summary values				

8)

Cost is £ $\frac{202}{1.62}$	M1		
= £ 124.6913..	A1		
= £ 124.69	A1	3	SC2 £124, £125, £124.70

9)

200	B1	Any indication