Mark Scheme 2641
June 2005

1.	(i)	Mean=35.2/80=0.44 Variance=175.08/80-0.44^2 1.99(49)	B1 M1 A1	3	
	(ii)	mean of x=11.44 Variance =1.99(49)	B1 ft B1 ft	2	From(i) From(i)
2.	(i)	9!/(4!3!2!) 1260	M1 A1	2	Use of formula
	(ii)	Perm remaining 5 5!/(3!2!)=10	M1 A1	2	Stated or implied
	(iii)	Ans(ii)/Ans(i) =1/126	B1ft	1	Allow 10/1260,0.00794
3.	(i)	L.Q.=2.75	B1		£ not required
		Median=3.50	B1		
		U.Q.=4.55 Allow slight variations for L.Q.,U.Q.(+/- 5p) SR Key misinterpreted. Acceptable answers x or / by 10 or 100	B1 B1	3	
	(ii)	Box-plot. Show 1.00,5.30, quartiles and Median. Scale indicated or implied.	M1 A1ft A1ft	4 3	Recognisable box-plot At least correct (ft) All correct (ft)
	(iii)(a)	Store a has greater variability.	B1		
	(b)	Sensible comment about skewness or symmetry.	B1	2	
4.	(i)	(5/6)^2x(5/6)	M1		
		a=125/216 b=1-125/216-1/36=85/216	A1 B1ft	3	aef Or independently
	(ii)	85/216+2x1/36 97/216	M1 A1	2	use of sum of xp (0.449)
	(iii)	Use B(5,125/216)	M1		Binomial recognized. 5C3 essential
		5C3(125/216)^3x(91/216)^2 0.344	A1ft A1	3	
5.	(i)	Scatter diagram	B1		Uniform scale, axes and points labelled.
			B1 B1		At least 6 pts. correct. All 9 correct.
	(ii)	e.g. C lower than B	B1	1	
	(iii)	9 8 7 6 5 4 3 2 1 9 7 8 6 5 3 2 4 1	B1		Correct ranks(or reversed)

		Sum of d^2=8	M1		attempt at d or d^2
		1-(6x8)/(9(9^2-1)) 14/15	M1 A1	 4	Correct use of formula (0.933)
	(iv)	Strong association between heights	B1	1	Or equivalent
	(v)	None	B1	1	
6.	(i)	Sxy=21020-360x367/8=4505			
		Sxx=20400-360x360/8=4200			
		Syy=21673-367x367/8	M1		Any 1 of Sxy,Sxx,Syy
		=4836.875			Correct.
		r=4505/(4200x4836.875)^0.5 =0.9995	A1 A1	 3	
	(ii)	Since x values are exactly is the dep. variable.	B1	1	or equivalent.
	(iii)	b=4505/4200	M1		x on y used
		=1.07(3)	A1		allow M1s for
		a=367/8-1.07..x45 y=-2.39+1.07x	M1 A1	 4	b',a' a=[-2.41,-2.39]
	(iv)	(a) 54.4 (g)	B1		[54.3,54.6]
		(b) 95.4 (g)	B1	2	[95.35,95.75]
	(v)	High value of r means that (a) is reliable but (b) is out of data range, so unreliable	B1ft B1		
7.	(i)	Imperfections occur independently with constant prob. Or reference to random sample	B1 B1	 2	 or at constant rate.
	(ii)	B(20,0.03)orB(20,0.97) stated or implied	M1		
		$0.97^{20}+20x0.97^{19}x0.03$ 1-[" " "] 0.1198	M1 M1 A1	 4	 allow 1,2or 3 terms in[] allow 0.12
	(iii)	1/0.1198 8.35	M1 A1	 2	1/their(ii)prov.not 0.03,0.97 [8.33,8.35]
	(iv)	P(U>10.35)=P(U>10)	M1		correct rounding of value to integer
		(1-0.1198)^10 0.279	M1A1ft A1	 4	M1 for (1-(ii))^integral part of (iii)+2,3or 4 A1 ft for index [(iii)]+2