Question	Scheme	Marks
2 (a)	<table><tr><td>**Athlete**</td><td>*A*</td><td>*B*</td><td>*C*</td><td>*D*</td><td>*E*</td><td>*F*</td><td>*G*</td><td>*H*</td></tr><tr><td>**Rank SBT**</td><td>4</td><td>2</td><td>1</td><td>3</td><td>5</td><td>6</td><td>8</td><td>7</td></tr><tr><td>**FP**</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table>	M1
	$\sum d^2 = 9+0+4+1+0+0+1+1\ [=16]$	M1
	$r_s = 1 - \frac{6("16")}{8(63)} = 0.8095....$ awrt 0.81	dM1 A1
		(4)
(b)	$H_0 : \rho = 0$, $H_1 : \rho > 0$	B1
	Critical Value $r_s = 0.8333$ or CR: $r_s \geqslant 0.8333$	B1
	Do not reject H_0 or not significant or does not lie in the critical region or there is no evidence of a positive correlation	M1
	There is no evidence of a **positive correlation** between **season's best time** and finishing **position** for these athletes	A1ft
		(4)
(c)	$r = \frac{0.225175}{\sqrt{0.1286875 \times 0.55275}}$	M1
	$= 0.84428...$ awrt 0.844	A1
		(2)
(d)	Critical Value $r = 0.7887$ or CR: $r \geqslant 0.7887$	M1
	so there is evidence of a **positive correlation** between **season's best time** and **finishing time** for these athletes	A1 ft
		(2)

		Notes	**Total 12**
(a)	**M1**	attempt to rank seasonal best time (at least four correct), May be implied by $\sum d^2 = 16$	
	M1	Attempt to find the difference between each of the **ranks** (at least 3 correct) and evaluating $\sum d^2$ May be implied by awrt 0.81 NB if no ranks for SBT it is M0	
	dM1	dependent on 1st M1. Using $1 - \frac{6\sum d^2}{8(63)}$ with their $\sum d^2$	
	A1	$\frac{17}{21}$ or awrt 0.81(0)	
	SC	for reverse rankings May score M1M1dM1A0 order 5 7 8 6 4 3 1 2 $\sum d^2 = 158$	
(b)	**B1**	both hypotheses correct. Must be in terms of ρ (allow something that looks like rho eg *p*). Must be attached to H_0 and H_1	
	B1	critical value of 0.8333 Sign should match there H_1 or r_s	
	M1	correct statement comparing their CV with their r_s - no context needed but do not allow contradicting non contextual comments. If no CV or test statistic given or the |test value| or |CV| > 1 then it is M0	
	A1ft	correct conclusion in context for their value of r_s from (a) and their stated CV. Conclusion must refer to **positive correlation**, **seasonal best** or **time** and **position**.	
	SC	For use of two-tailed test: May score B0B1M1A0 CV allow 0.881…)	
(c)	**M1**	correct method used	
	A1	awrt 0.844	
(d)	**M1**	Critical value of 0.7887 Allow 0.8343 if hypotheses are two tailed in (b)	

A1ft	M1 must be awarded. A correct conclusion for their value of *r* from (c) Conclusion must refer to **positive correlation**, **seasonal best** or **time** and **finishing time**. Do not allow contradicting comments. if the |test value| or |CV| > 1 then it is M0