Question Number	Scheme	Marks
1 (a)	**Discrete uniform**	B1
		(1)
(b)	$\frac{1}{2}$	B1
		(1)
(c)(i)	[E(R) =] 2.5	B1
(ii)	[E(B) =] 4	B1
		(2)
(d)	$[\mathrm{E}(B^2)=]\frac{1}{4}\left(1^2+3^2+5^2+7^2\right)=21$	M1
	$\mathrm{Var}(B)=\mathrm{E}(B^2)-\left(\mathrm{E}(B)\right)^2="21"-"4"^2$	M1
	$=5$	A1
		(3)
(e)	Possible combinations (R, B) : (1,1) (1,3) (2,1) (3,1) (4,1) (2,3) <u>or</u> $\frac{1}{4}\times\frac{1}{4}\times 6$	M1
	$\mathrm{P}(R+B\text{„ }5)=\frac{6}{16}$	A1
		(2)
(f)	R^2 | 1 | 4 | 9 | 16 B | 1 | 3 | 5 | 7	
	Possible combinations (R, B) : (1,3) (1,5) (1,7) (2 (4),5) (2 (4),7) <u>or</u> $\frac{1}{4}\times\frac{1}{4}\times 5$	M1A1
	$\mathrm{P}(R^2<B)=\frac{5}{16}$	A1
		(3)
(g)	$B=5$ and $R=1, B=7$ and $R=3[\rightarrow D=4]$; $B=7$ and $R=2[\rightarrow D=5]$	M1
	$\mathrm{P}(D=4)=\frac{1}{4}\times\frac{1}{4}\times 2=\frac{1}{8}$; $\mathrm{P}(D=5)=\frac{1}{4}\times\frac{1}{4}=\frac{1}{16}$	A1
	$p=\mathrm{F}(4)=\frac{3}{4}+\frac{1}{8}=\frac{7}{8}$; $p=\mathrm{F}(5)-\mathrm{P}(D=5)=\frac{15}{16}-\frac{1}{16}=\frac{7}{8}$	A1
		(3)
	Notes	**Total 15**

(a)	**B1**	Must include both words (in either order). Ignore extraneous non-contradictory words.
(b)	**B1**	0.5 oe
(c) (i)	**B1**	cao need not be labelled unless done in wrong order (blue then red)
(ii)	**B1**	cao need not be labelled unless done in wrong order (blue then red)
(d)	**M1**	Correct method to find $\mathrm{E}(B^2)$ at least 3 terms correct (implied by $\mathrm{E}(B^2)=21$). Ignore label. $\mathrm{E}(B^2)=\frac{21}{4}$ is M0
	M1	Correct method to find Var(B) ft their $\mathrm{E}(B^2)$ and their E(B)
	A1	cao an answer of 5 without working send to review
(e)	**M1**	At least 4 correct combinations identified with no incorrect ones given. Ignore duplicates, but do not accept eg (1, 4) as a duplicate of (4, 1). If not labelled, combinations must be consistently ordered. **<u>or</u>** if no combinations given, correct probability calculation (implied by correct answer with no obvious incorrect working)
	A1	0.375 oe must come from correct combinations or correct working

(f)	**M1**	At least 3 correct combinations identified with no incorrect ones given. Ignore duplicates, but do not accept eg (1, 4) as a duplicate of (4, 1). If not labelled, combinations must be consistently ordered. (allow 4, 5 and 4, 7 stated as combinations instead of 2, 5 and 2, 7)
	A1	All 5 correct combinations with no extras or duplicates. **or** if no combinations given, correct probability calculation (M1A1 implied by correct answer with no obvious incorrect working)
	A1	$\frac{5}{16}$ oe (accept awrt 0.313) must come from correct combinations or correct working
(g)	**M1**	Correct combinations identified for $D = 4$ or $D = 5$ (may be implied by correct working for 1st A1).
	A1	$\mathrm{P}(D = 4) = \frac{1}{8}$ or $\mathrm{P}(D = 5) = \frac{1}{16}$ need not be labelled but working/combinations must imply the correct label do not award this mark for $\mathrm{F}(4) = \frac{1}{8}$ on its own These may be seen as part of the probability distribution of D
	A1	0.875 oe Correct answer does not automatically imply 3 out of 3. Need to see correct combinations identified or see correct probability calculation/distribution. Answer only is 0 out of 3.