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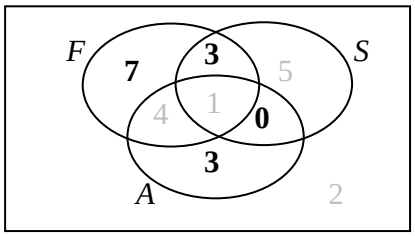
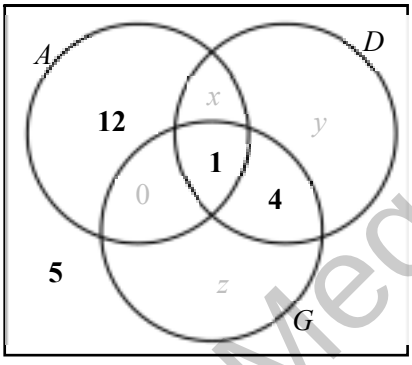
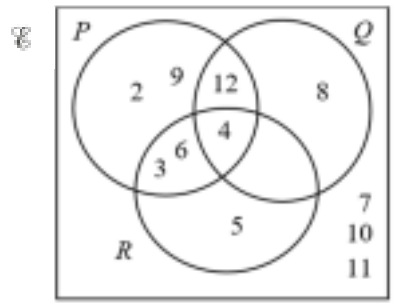
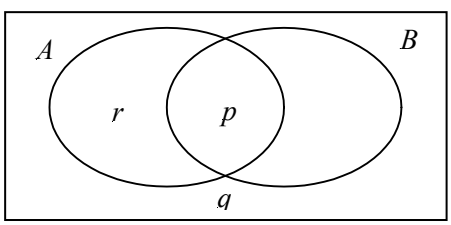
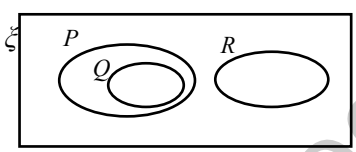
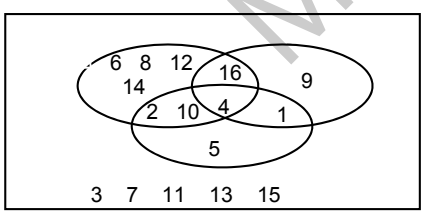
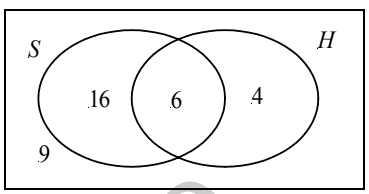
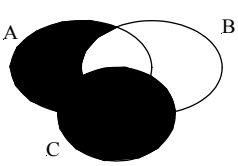
1(a)(i)	12, 16, 18, 24, 25, 30, 36	**1**	
1(a)(ii)	2	**1**	
1(b)	$(D \cup C) \cap B'$ oe	**1**	
1(c)(i)	Venn diagram completed correctly 	**2**	**B1** for 2 values correct
2(a)(i)	{a, e, f, g, h, i, j}	**1**	
2(a)(ii)	6	**1**	
2(b)	$A \cap C \cap B'$ oe	**1**	
3(a)		**2**	**B1** for 2 or 3 values correctly placed
3(b)	[x =] 3 [y =] 6 [z =] 9	**3**	**B2** for $x = 3$ OR **M2** for $\frac{40-12-1-4-5}{1+2+3}$ soi or **M1** for 40 – 12 – 1 – 4 – 5 soi or $x + y + z + 12 + 1 + 4 + 5 = 40$ oe
3(c)	$A \cap G \cap D'$ oe	**1**	
3(d)	(*their* x) + 1 evaluated	**1**	

Mega Lecture

4(a)	$(A \cup B)'$ oe	**1**	
4(b)(i)		**3**	**B2** for Venn diagram with 1 or 2 errors, omissions or repeats or for correct Venn diagram with $(P \cup Q \cup R)'$ blank or **B1** for Venn diagram with 3 or 4 errors, omissions or repeats or for correct Venn diagram with $(P \cup Q \cup R)'$ blank and one further error
4(b)(ii)	2, 9	**1**	FT *their* diagram
4(b)(iii)	7	**1**	
4(b)(iv)	$P' \cap Q \cap R$ oe	**1**	
5(a)	10 or $n(P \cup Q) = 10$ cao	**1**	
5(b)		**3**	**B1** for each correct p, q and r.
6		**2**	**B1** for Q or R correct
7(a)(i)	Correctly completed Venn diagram 	**3**	**B2** for Venn diagram with one or two errors, omissions or repeats or for correct Venn diagram with 3, 7, 11, 13, 15 omitted or **B1** for Venn diagram with three or four errors, omissions or repeats or for correct Venn diagram with 3, 7, 11, 13, 15 omitted and <u>one</u> other error, omission or repeat
7(a)(ii)	10	**1**	
7(a)(iii)	2, 4, 10	**1**	**FT** *their* Venn diagram
8(a)	$(P \cup R) \cap Q'$	**1**	
8(b)	Any irrational number in range $9 < x < 10$	**2**	**B1** for any irrational number as answer or any number in range $9 < x < 10$ as answer

Mega Lecture

9(a)	0, 2	**1**	
9(b)	6	**1**	
9(c)	0, 2, 4, 6	**2**	**B1** for 0, 2, 4, 6 plus extras (e.g. repeated 2 or 4; or an 8) or **B1** for three of 0, 2, 4, 6 with no extras. or **M1** for $2x + y$ clearly seen correctly evaluated for two or more valid values of x and y
10	9	**2**	**B1** for a Venn diagram with at least two of 16, 6, 4, 9 in the correct subset.  or **M1** for $35 - (22 + 10 - 6)$ oe
11(a)(i)	Correctly completed Venn diagram	**1**	
11(a)(ii)	36	**1**	
11(a)(iii)	13	**1**	**FT** n($A \cup B$) from *their* Venn diagram provided no repeated elements in sets A and B
11(a)(iv)	1, 4, 6, 9, 12, 18	**1**	**FT** provided no repeated elements in sets A and B
12(a)(i)	1	**1**	
12(a)(ii)	10, 12, 14, 15, 16, 18, 20	**1**	
12(a)(iii)	$\frac{7}{11}$ oe	**1**	
12(b)(i)	8	**2**	**M1** for $14 + 10 + 24 - x = 40$ oe or for correct Venn diagram with algebraic expressions. **Or B1** for Venn diagram with at least 3 numbers correct
13 (a)	 	1	
(b)	8	2*	**M1** for $23 + 17 - (36 - 4)$ or **M1** for $23 - x + x + 17 - x + 4 = 36$ oe or **B1** for S ∩ F' = 15 or F ∩ S' = 9

Mega Lecture

14 (a) (i)	(a) 10	**1**	
	(b) 9	**1**	
	(c) 3,5,7,11	**1**	
(ii)	$\frac{4}{11}$ oe isw	**1ft**	ft from *their* (a)(i)(c)

15	16	2*	**B1** for 15, 8 and 11 correctly placed and 26 not placed in Venn diagram or for $x + 26 + 8 = 50$ oe or for $50 - 26 - 8$ oe leading to answer
16 a	47	2	**M1** for Cricket set inside the Football set, e.g. in a Venn diagram; Ans. = 30+8+9; "30 play both cricket and football".
b)	11, 19	1	

Mega Lecture