

8(a)	1 mark for each shaded section					
	Instruction address	ACC	Memory address			
			80	81	82	83
			10	8	80	81
	200	8				
	201	9				
	202					9
	203	10				
	204	9				
	206					
	207	19				
	208					
	210			19		
	8(b)(i)	1 mark for: OR B0000 0001 // OR #1 // OR &1				
8(b)(ii)	1 mark for: 1010 1011					
8(b)(iii)	1 mark for: 0000 0011					

7(a)(i)	1 mark for 0010 1000
7(a)(ii)	1 mark for 1111 0011
7(b)	1 mark for $\begin{array}{r} 1\ 1\ 1\ 1\ 0\ 1\ 0\ 1 \\ +_1\ 1\ 1\ 0\ 1\ 1\ 1\ 0\ 0\ 0\ 1\ 1 \\ \hline (1)\ 1\ 0\ 1\ 0\ 0\ 1\ 1\ 0 \end{array}$ Answer: (1) 1010 0110
7(c)	1 mark for showing binary subtraction (any method) Direct subtraction: $\begin{array}{r} 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1\ 0\ 0 \\ -_0\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 1\ 0 \\ \hline 0\ 1\ 0\ 0\ 0\ 1\ 1\ 0 \end{array}$ Adding the two's complement: $\begin{array}{r} 0\ 1\ 1\ 0\ 0\ 1\ 0\ 0 \\ +_1\ 1\ 1\ 1\ 1\ 0\ 0\ 0\ 1\ 0 \\ \hline (1)\ 0\ 1\ 1\ 0\ 0\ 0\ 1\ 1\ 0 \end{array}$ 1 mark for answer 0100 0110

7(a)	1 mark each:		
		Instructions	ACC content
1	LDD 50 ADD #4 ADD 54		158
2	LDI 53 DEC ACC ADD 56		99
3	LDM #55 SUB #5		50
7(b)	1 mark for each bullet point for the explanation 1 mark for correct instruction - A bit manipulation operation is required to set all the bits to zero - Compare the result of the masking with 0 ... the result of comparison will be true if the register is cleared - AND B00000000 / #00 / &00		

5(a)

1 mark for each correct answer:

Program Number	Code	ACC Content
1	LDI 15 SUB #1	11
2	LDD 14 ADD 11	13
3	LDM #11 ADD #3 SUB 16	2
4	LDR #2 LDX 14 ADD #2	14

5(b)

1 mark for each correct answer:

Program Number	Code	ACC Content
1	XOR 29	0100 1001
2	AND #29	0000 0100
3	OR B1111111	1111 1111