Ans. to the Q. no - 1

(i) $\frac{\log n}{\log 2}$ $n = 2^m$

(ii) 4

(iii) 16:1 and 8:1 MUX both have 1 output.

Ans. to the Q. no - 2

(i) 3 to 8 line decoder

(ii) 4-bit adder - substractor

(iii) Half - adder

Ans. to the Q. no-3

(a)

Decimal	Input				Output						
	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	1	1	1	1	1	1	0
1	0	0	0	1	0	1	1	0	0	0	0
2	0	0	1	0	1	1	0	1	1	0	1
3	0	0	1	1	1	1	1	1	0	0	1
4	0	1	0	0	0	1	1	0	0	1	1
5	0	1	0	1	1	0	1	1	0	1	1
6	0	1	1	0	1	0	1	1	1	1	1
7	0	1	1	1	1	1	1	0	0	0	0
8	1	0	0	0	1	1	1	1	1	1	1
9	1	0	0	1	1	1	1	1	0	1	1

(b)

AB \ CD	00	01	11	10
00	1	0	1	1
01	0	1	1	1
11	X	X	X	X
10	1	1	X	X

$$a = \bar{B}\,\bar{C}\,D + \bar{A}\,B\,D + A\,\bar{B}\,\bar{C} + \bar{A}\,C$$

AB\CD	00	01	11	10
00	1	0	1	1
01	0	1	0	1
11	X	X	X	X
10	1	1	X	X

$$d = \bar{B}\bar{C}D + B\bar{C}D + \bar{A}\bar{B}C + C\bar{D}$$

AB\CD	00	01	11	10
00	0	0	1	1
01	1	1	0	1
11	X	X	X	X
10	1	1	X	X

$$g = B\bar{C} + \bar{A}\bar{B}C + A\bar{B} + C\bar{D}$$

Ans. to the Q.no - 4

(a) Data selector

(b) (i)

(c) 1000 bits

(d) (i) 01010101

(e) ~~1111~~ 1111