1.

(a)

$$B \begin{bmatrix} N_1 & 3 & A \\ N_2 & 0 & d \\ N_3 & 2 & C \\ N_4 & 4 & E \\ N_5 & 1 & E \\ N_6 & 2 & E \\ & & E \end{bmatrix}$$

(b)
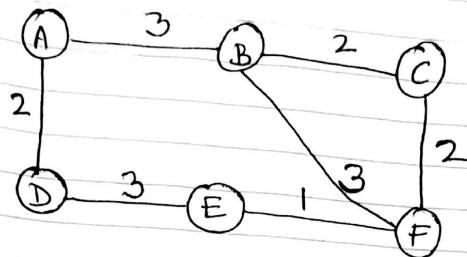
$$B \begin{bmatrix} N_1 & 3 & A \\ N_2 & 0 & d \\ N_3 & 2 & C \\ N_4 & 5 & A \\ N_5 & 4 & F \\ N_6 & 3 & F \end{bmatrix}$$

(c)
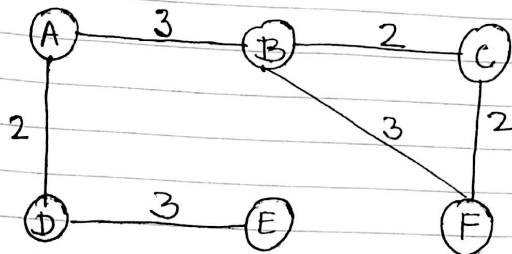
$$B \begin{bmatrix} N_1 & 3 & A \\ N_2 & 0 & d \\ N_3 & 2 & C \\ N_4 & 5 & A \\ N_5 & 8 & A \\ N_6 & 3 & F \end{bmatrix}$$

2.

Link State Database

LSP1 (R1)	LSP2 (R2)	LSP3 (R3)	LSP4 (R4)	LSP5 (R5)	LSP6 (R6)
N_1 0	N_2 0	N_3 0	N_4 0	N_5 0	N_6 0
R_2 1	R_1 1	R_2 4	R_5 6	R_1 3	R_3 5
R_5 3	R_3 4	R_6 5	R_6 7	R_2 2	R_4 7
	R_5 2			R_4 6	R_5 8
				R_6 8	

3.
a. 0::0
0000:0000:0000:0000:0000:0000:0000:0000

b. 0:AA::0
0000:00AA:0000:0000:0000:0000:0000:0000

c. 0:1234::3
0000:1234:0000:0000:0000:0000:0000:0003

d. 123::1:2
0123:0000:0000:0000:0000:0000:0001:0002

4.
- 0::0
Unspecified Address

- 0::FFFF:0:0
0000:0000:0000:0000:0000:FFFF:0000:0000
Mapped Address

- 582F:1234::2222
582F:1234:0000:0000:0000:0000:0000:2222
Provider Based Unicast Address

- 4821::14:22
4821:0000:0000:0000:0000:0000:0014:0022
Provider Based Unicast Address

5. Image below:-

VER	PRI: 4	FLOW LABEL: 2342
0110	0100	0000000000	000		0	0 0000	0

Payload length: 320	NH: 6	Hop limit: 64
Binary format: 000000||0 0|0 0000	0 0 0 0 0 ||0	0||00|00

Destination Address⇒ 582F: 1234 :: 2222

0|0||00000|0|||: 000|00|000||0|00:: 00|000|000|000|0

Source Address ⇒ 4821 :: 14: 22

0|00|00000|0000|:: 0000000000 0|0|00: 0000000000|000 |0

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6. Each term is divided by 16 and its hex equivalent and remainder is found.
Writing IPv4(129.6.12.34) to IPv6
0:0:0:0:0:FFFF:8106:C22

7. Loopback Address in Hexadecimal colon notation is "::1/128"