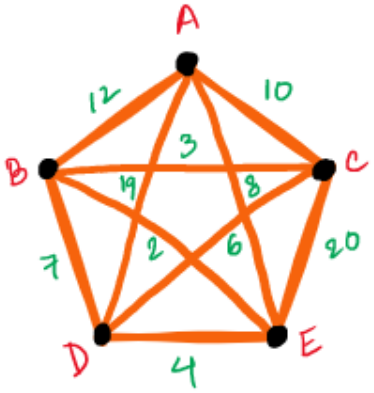
Senjuti Maiti
19S-221

1) Adjacency matrix:

	A	B	C	D	E
A	0	12	10	19	8
B	12	0	3	7	2
C	10	3	0	6	20
D	19	7	6	0	4
E	8	2	20	4	0



Tabular Calculation:-

Bottom level - $g\{B,\phi\} = 12$ $g\{C,\phi\} = 10$ $g\{D,\phi\} = 19$ $g\{E,\phi\} = 8$

Next level - $g\{B,\{C\}\} = 3+10 = 13$ $g\{B,\{D\}\} = 19+7 = 26$ $g\{B,\{E\}\} = 8+2 = 10$

$g\{C,\{B\}\} = 12+3 = 15$ $g\{C,\{D\}\} = 19+6 = 25$ $g\{C,\{E\}\} = 8+20 = 28$

$g\{D,\{B\}\} = 12+7 = 19$ $g\{D,\{C\}\} = 10+6 = 16$ $g\{D,\{E\}\} = 8+4 = 12$

$g\{E,\{B\}\} = 12+2 = 14$ $g\{E,\{C\}\} = 10+20 = 30$ $g\{E,\{D\}\} = 19+4 = 23$

Next level - $g\{B,\{C,D\}\} = 16+7 = 23$ $g\{B,\{C,E\}\} = 28+3 = 31$ $g\{B,\{D,E\}\} = 12+7 = 19$

$g\{C,\{B,D\}\} = 19+6 = 25$ $g\{C,\{B,E\}\} = 10+3 = 13$ $g\{C,\{D,E\}\} = 12+6 = 18$

$g\{D,\{B,C\}\} = 13+7 = 20$ $g\{D,\{B,E\}\} = 16+7 = 17$ $g\{D,\{C,E\}\} = 28+6 = 34$

$g\{E,\{B,C\}\} = 13+2 = 15$ $g\{E,\{B,D\}\} = 19+4 = 23$ $g\{E,\{C,D\}\} = 16+4 = 20$

Next level - $g\{B,\{C,D,E\}\} = 18+3 = 21$ $g\{C,\{B,D,E\}\} = 19+3 = 22$

$g\{D,\{B,C,E\}\} = 13+6 = 19$ $g\{E,\{B,C,D\}\} = 20+4 = 24$

Next level - $g\{A,\{B,C,D,E\}\} = 22+10 = 32$ or $24+8 = 32$

Path: $A \to C \to B \to D \to E \to A$ or $A \to E \to D \to B \to C \to A$

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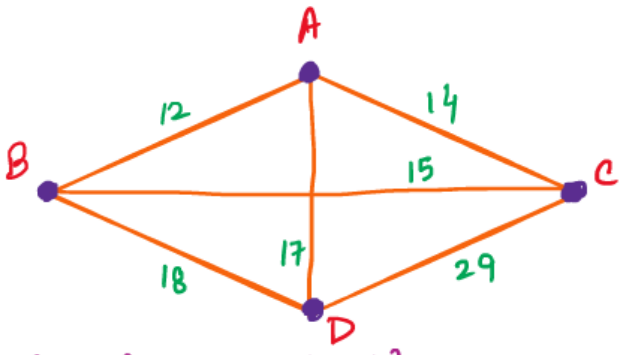
Adjacency matrix:

	A	B	C	D
A	0	12	14	17
B	12	0	15	18
C	14	15	0	29
D	17	18	29	0



Tabular Calculation: $g\{B,\phi\} = 12$ $g\{C,\phi\} = 14$ $g\{D,\phi\} = 17$ ← Bottom level

Next level: $g\{B,\{C\}\} = 14+15 = 29$ $g\{B,\{D\}\} = 17+18 = 35$

$g\{C,\{B\}\} = 12+15 = 27$ $g\{C,\{D\}\} = 17+29 = 46$

$g\{D,\{B\}\} = 12+18 = 30$ $g\{D,\{C\}\} = 14+29 = 43$

Next level: $g\{B,\{C,D\}\} = 46+15 = 61$ or, $43+18 = 61$

$g\{C,\{B,D\}\} = 35+15 = 50$

$g\{D,\{B,C\}\} = 29+18 = 47$

Topmost level: $g\{A,\{B,C,D\}\} = 47+17 = \underline{64}$ or $50+14 = \underline{64}$

Path: $A \to D \to B \to C \to A$ or $A \to C \to B \to D \to A$