

Name: MD MEHEDI HASAN

Matric NO: A20 M74005

Assignment: 3

①

Incidence matrix

	a	b	c	d	e	f	g	h	i	R
1	1	1	0	1	0	0	0	0	0	0
2	1	0	1	0	0	0	0	0	0	0
3	0	1	0	0	1	1	1	0	0	0
4	0	0	1	1	1	0	1	0	0	0
5	0	0	0	0	0	1	0	0	0	1
6	0	0	0	0	0	0	1	1	2	1

(11) Adjacency ¹
~~Incidence~~ matrix

Adj =

	1	2	3	4	5	6
1	0	1	1	1	0	0
2	1	0	0	1	0	0
3	1	0	0	1	1	1
4	1	1	1	0	0	2
5	0	0	1	0	0	0
6	0	0	1	2	0	1

②

Yes the graph has a hamiltonian cycle present

Hamiltonian Path = $\{1, a, 2, e, 6, R, 5, m, 8, 4, i, f, 3, c, d, 1\}$

③

③

	a	v_1	v_2	v_3	v_4	v_5	v_6	z
a	∞	∞	∞	∞	∞	∞	∞	∞
v_1		③	4	∞	15	∞	∞	∞
v_2			④	10	9	∞	∞	∞
v_5				10	9	⑧	∞	13
v_4				10	⑨	∞	∞	13
v_3				⑩	∞	16	∞	13
z						14	∞	⑬
v_6						⑭	∞	∞

The shortest Path ~~is not display~~ from a to z
is ~~10~~ or a v_2 z and the Distance
is 13

④

a) ~~to, g, c, a~~ d

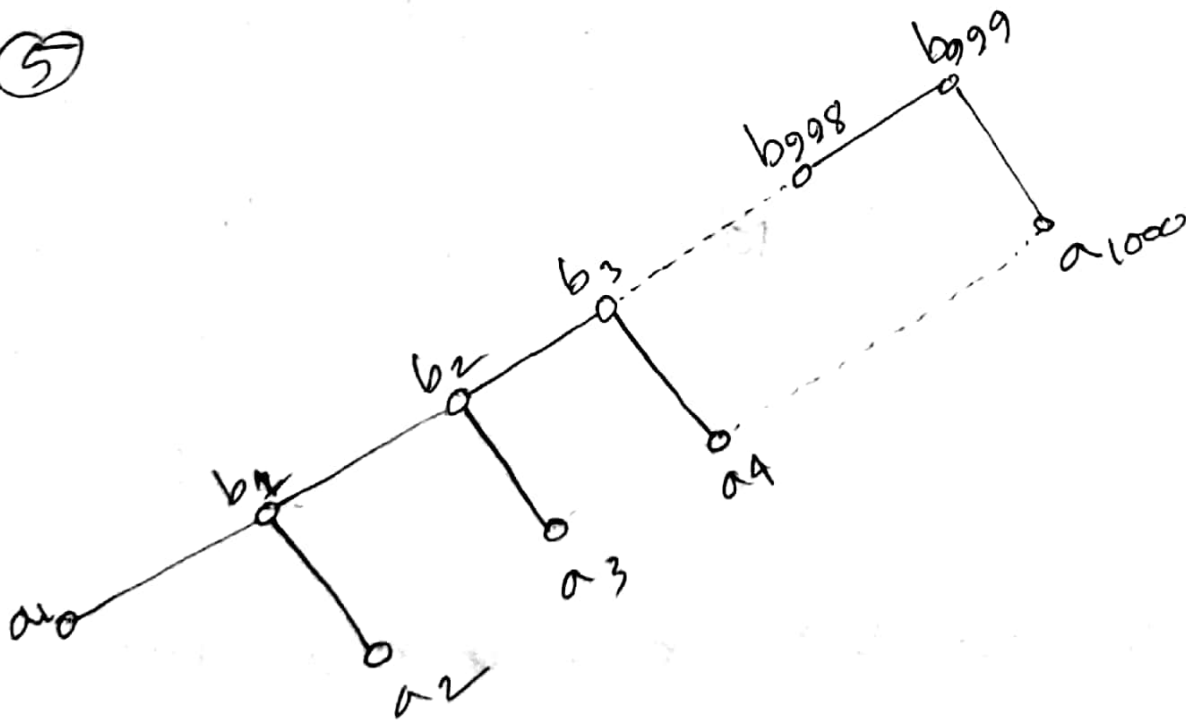
b) ^{Descendant} ~~Distance~~ of $b = \{h, i, j \text{ and } k\}$

c) c

d) f and g

e) d

⑤



~~Let the players be~~
~~100~~

Let $n = 100$

Starting from bottom to up players is eliminated
each time.

No. of matches = No. of internal nodes (i)

so only 2 players play a match at once

$$m = 2$$

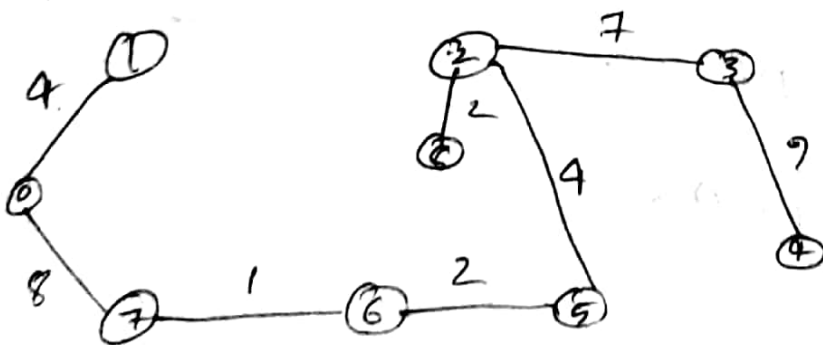
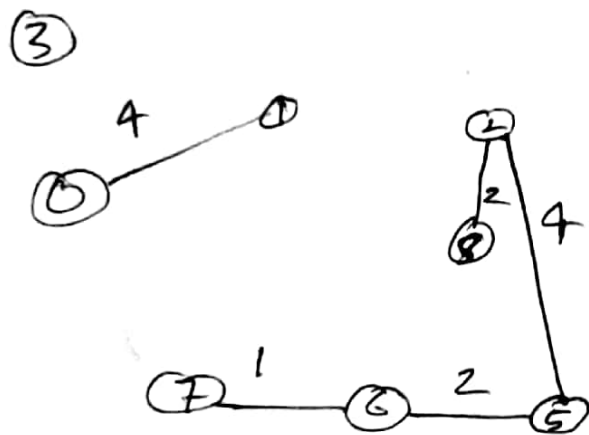
$$\text{so, } i = \frac{n-1}{m-1} = \frac{100-1}{2-1} = 99$$

$\therefore$ 99 games needed to be played to
select a champion.

⑥

weight: 1, 2, 2, 4, 4, 6, 7, 7, 8, 9, 10, 11, 19

Using Kruskal's algorithm MST



$$\text{total} = 4 + 8 + 1 + 2 + 4 + 2 + 7 + 9$$

$$= 37$$