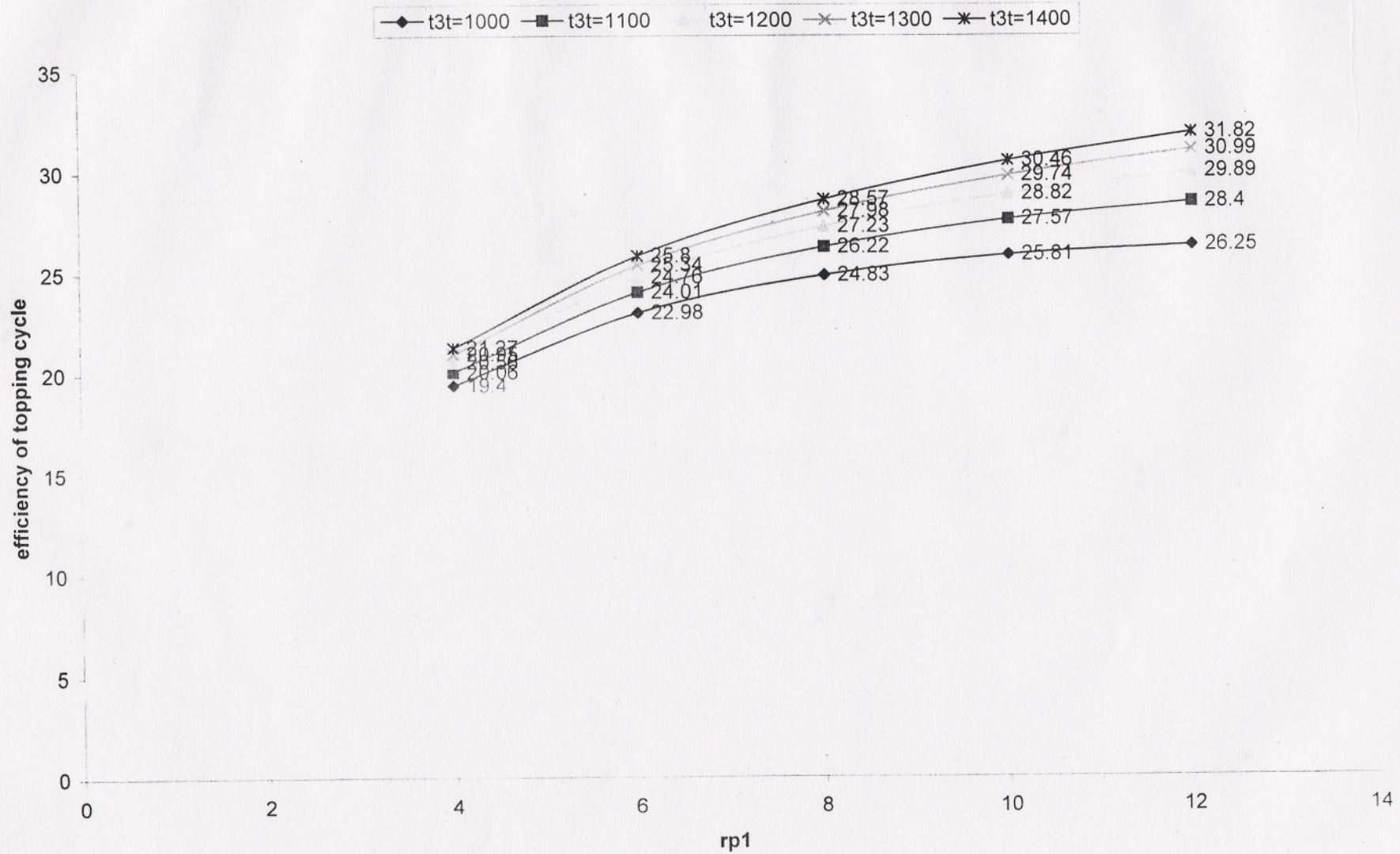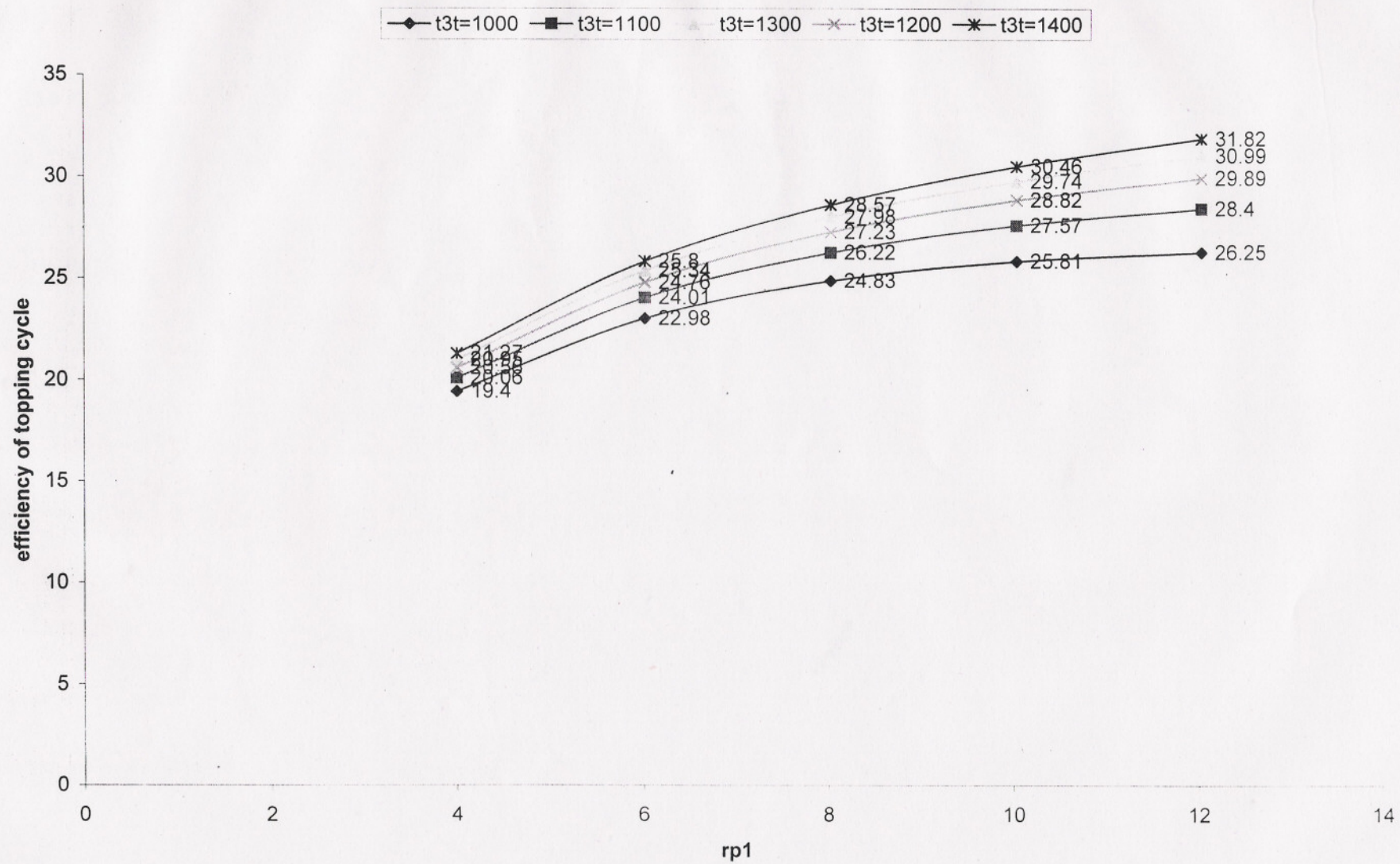varition of efficiency of topping cycle w.r.t rp1 for different values of t3t at e=0.7

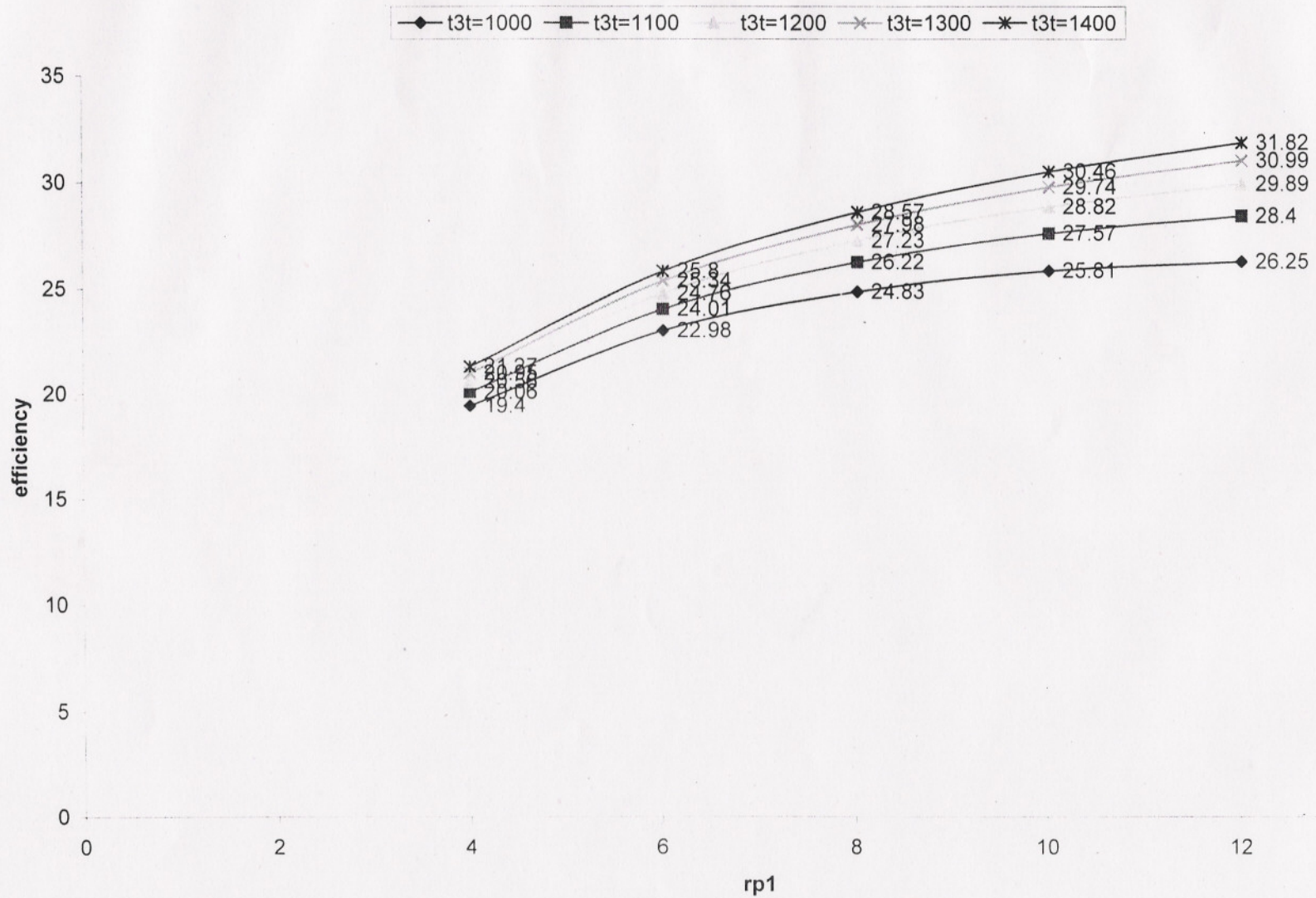varition of efficiency of topping cycle for different values of t3t at e=0.8

varition ofefficiency of topping cycle w.r.t rp1 for no intercooler at e=0.9

varition of net work of topping cycle w.r.t for different values of t3t at e=0.7

◆ t3t=1400   ■ t3t=1300   t3t=1200   ✳ t3t=1100   ✱ t3t=1000

net work

rp1

19036
21911
23236
23858
24103

16891
19265
20265
20650
20710

14745
16619
17293
17441
17317

12599
13973
14322
14232
13924

10454
11327
11350
11024
10531

30000
25000
20000
15000
10000
5000
0

0   2   4   6   8   10   12   14
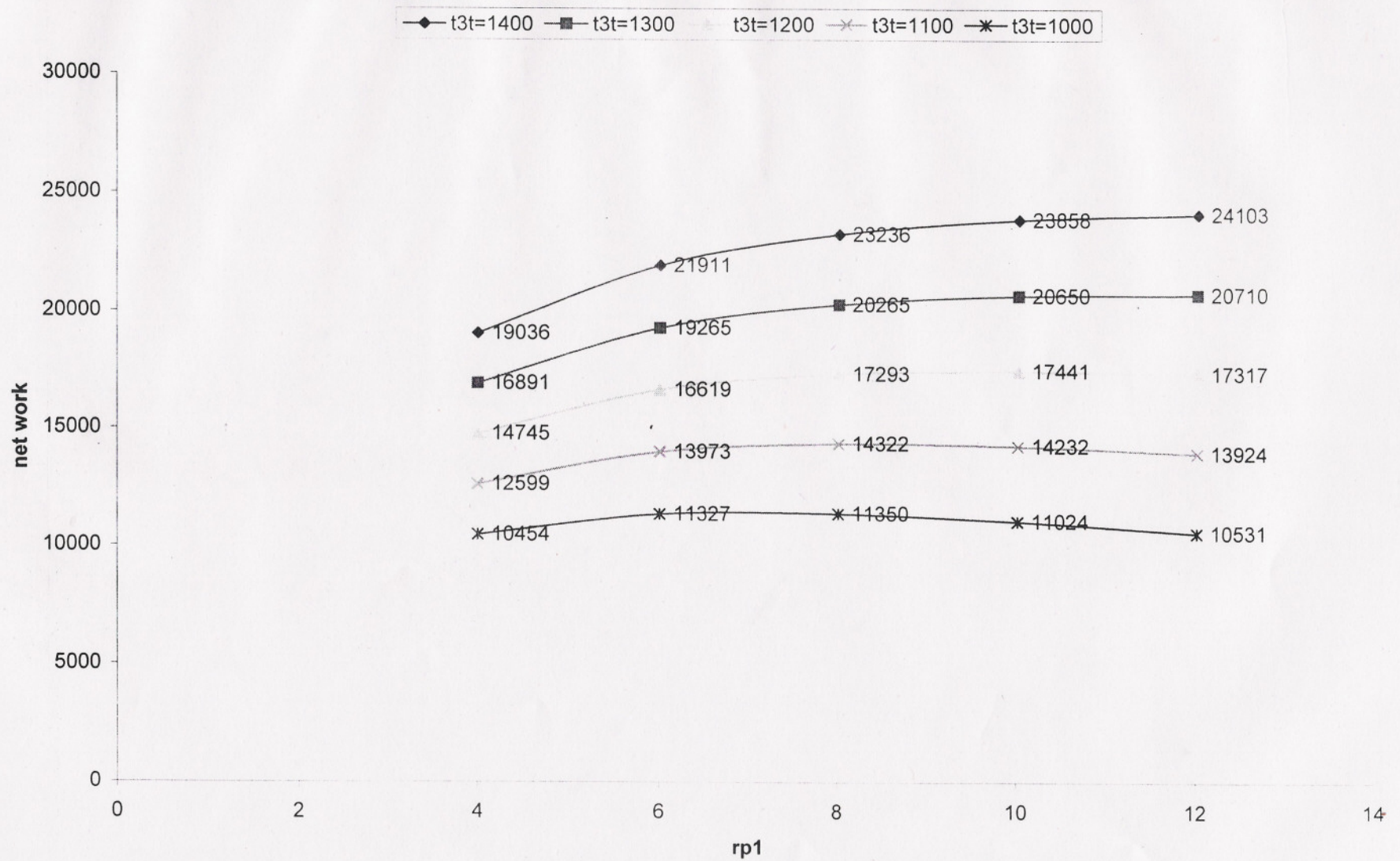
varition of net work done of topping cycle w.r.t rp1 for dirrerent values of t3t at e=0.8

Legend: t3t=1000, t3t=1100, t3t=1200, t3t=1300, t3t=1400

net work of topping cycle (y-axis), rp1 (x-axis)

Data labels:
- 24103, 23858, 23236, 21911, 19036
- 20710, 20650, 20265, 19265, 16891
- 17317, 17441, 17293, 16619, 14745
- 13924, 14232, 14322, 13973, 12599
- 10531, 11024, 11350, 11327, 10454
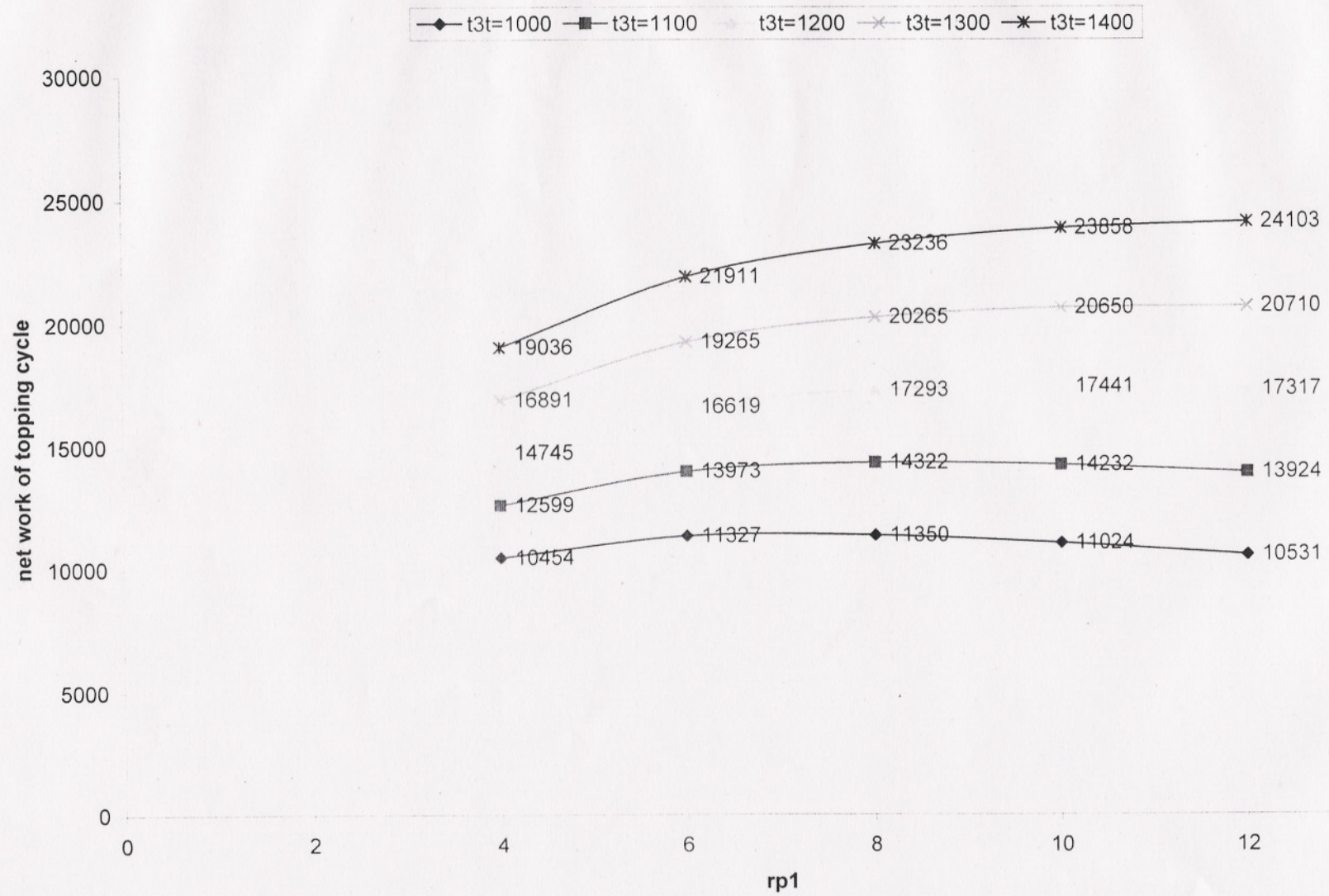
varition of net work of topping cycle w.r.t rp1 for different t3t at be=0.9

varition of heat supplied w.r.t rp1 for different values of t3t at e=0.7

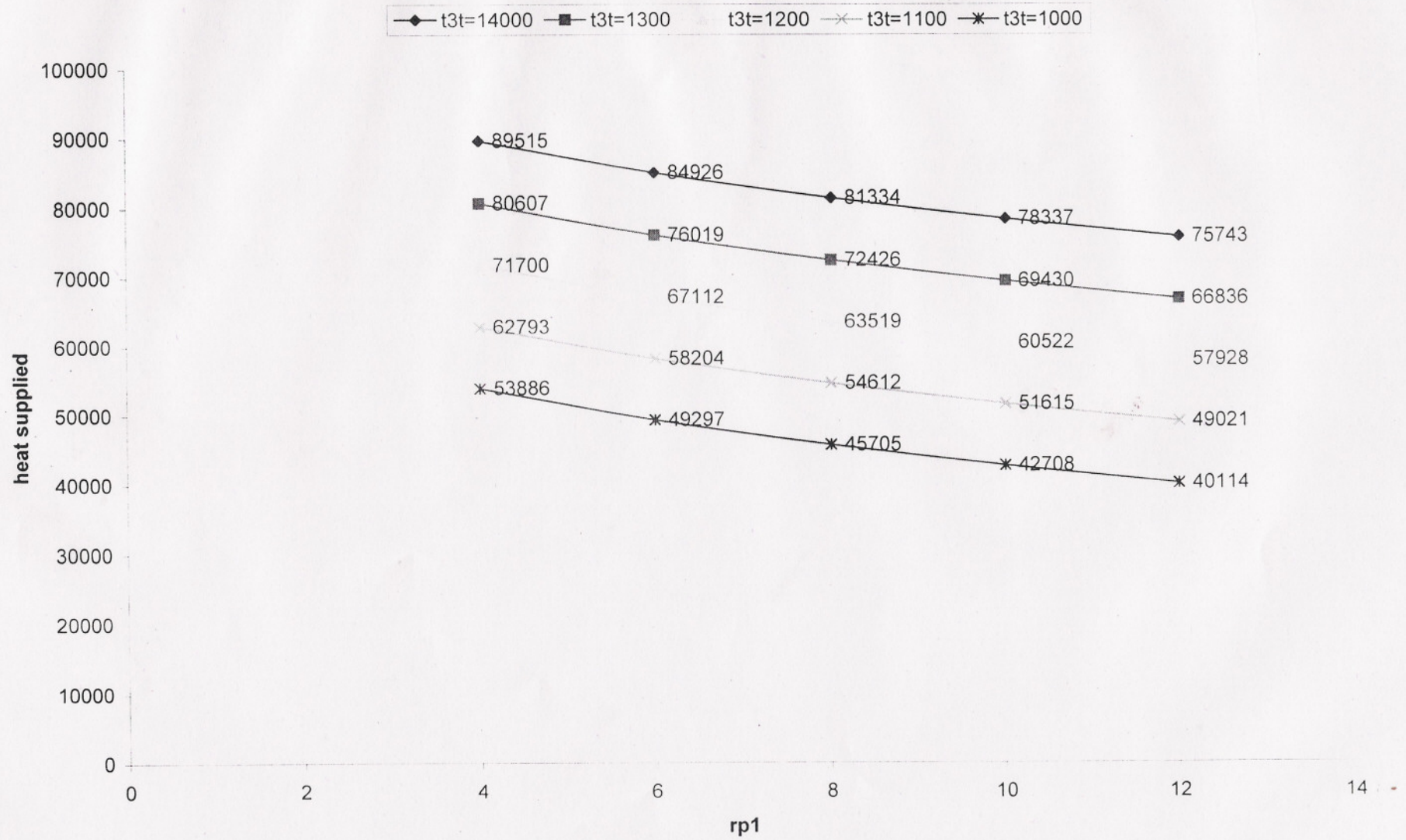Legend: t3t=14000, t3t=1300, t3t=1200, t3t=1100, t3t=1000

Data points for t3t=14000: 89515, 84926, 81334, 78337, 75743
Data points for t3t=1300: 80607, 76019, 72426, 69430, 66836
Data points for t3t=1200: 71700, 67112, 63519, 60522, 57928
Data points for t3t=1100: 62793, 58204, 54612, 51615, 49021
Data points for t3t=1000: 53886, 49297, 45705, 42708, 40114

Y-axis: heat supplied (0 to 100000)
X-axis: rp1 (0 to 14)

varition of heat supplied w.r.t rp1 for different values of t3t at e=0.8

Legend: ◆ t3t=1000 ■ t3t=1100 t3t=1200 ✕ t3t=1300 ✳ t3t=1400

Data points:

- t3t=1400 (✳): 89515, 84926, 81334, 78337, 75743
- t3t=1300 (✕): 80607, 76019, 72426, 69430, 66836
- t3t=1200: 71700, 67112, 63519, 60522, 57928
- t3t=1100 (■): 62793, 58204, 54612, 51615, 49021
- t3t=1000 (◆): 53886, 49297, 45705, 42708, 40114

y-axis: heat supplied (0 to 100000)
x-axis: rp1 (0 to 14)

varition of heat supplied in the combustio chamber of topping cycle w.r.t rp1 for different t3t at e=0.9
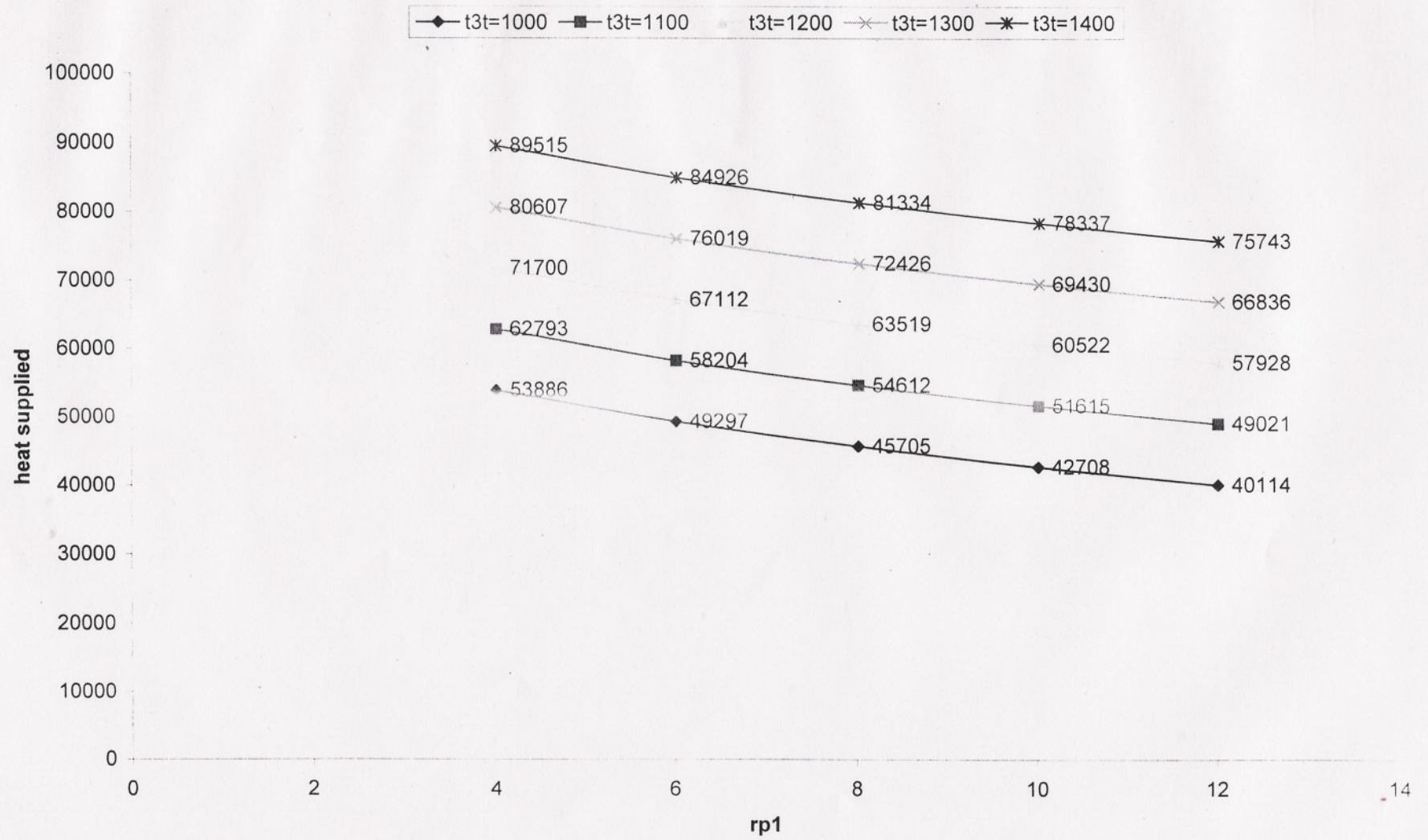
Discussion on Results:

a)   **Efficiency of Topping Cycle:**

❖ The efficiency of topping cycle increases with increase in the turbine inlet temperature, t3t for every particular value of pressure ratio of topping cycle (rp1) of ABC.

❖ The efficiency of topping cycle increases with increase in with pressure ratio of topping cycle (rp1) of ABC for any particular value of turbine inlet temperature of ABC

❖ The efficiency of topping cycle is independent of effectiveness of heat exchanger as well as mass flow rate of ABC.

b)   **Network of Topping Cycle:**

❖ The network of topping cycle increases with increase in the turbine inlet temperature, t3t for every particular value of pressure ratio of topping cycle (rp1) of ABC.

❖ The network of topping cycle increases with increase in with pressure ratio of topping cycle (rp1) of ABC for any particular value of turbine inlet temperature of ABC

❖ The network of topping cycle is independent of effectiveness of heat exchanger as well as mass flow rate of ABC.

a)   **Heat supplied of Topping Cycle:**

❖ The heat supplied in combustion chamber of topping cycle increases with increase in the turbine inlet temperature, t3t for every particular value of pressure ratio of topping cycle (rp1) of ABC.

❖ The heat supplied in combustion chamber of topping cycle increases with increase in with pressure ratio of topping cycle (rp1) of ABC for any particular value of turbine inlet temperature of ABC

❖ The heat supplied in combustion chamber of topping cycle is independent of effectiveness of heat exchanger as well as mass flow rate of ABC.