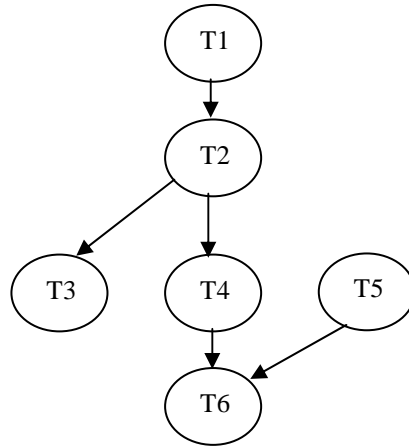


KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
COMPUTER ENGINEERING DEPARTMENT

COE 308, Term 982

**Homework #7
SOLUTION**

Q.1. Assume a program can be represented graphically as follows:



Where T1, T2 and T3 take 5 cycles to execute on processor X while T4, T5, and T6 take 6 cycles to execute on the same processor.

- (a) Total execution time of the program on processor X = **33 cycles**
- (b) One optimal schedule for $n = 2$:

cycles:																													
P1:																													
P2:																													
- Therefore $t_2 = 22$ cycles, Speedup = $33/22=1.5$ or **50%**, Efficiency = $1.5/2=0.75$ or **75%**.
- (c) One optimal schedule for $n = 3$ is the same as for $n=2$.
 Therefore $t_3 = 22$ cycles, Speedup = $33/22=1.5$ or **50%**, Efficiency = $1.5/3=0.5$ or **50%**.
- (d) Speedup maximizes at $n = 2$.
- (e) Efficiency is maximum at $n = 1$.

Q.2. Maximum speedup possible using Amdahl's theorem is $1/\alpha = 1/0.05 = 20$.