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Ans-1

→ When two process runs simultaneously with cpu then this condition known as parallism.

If there is n parallel process (p1, p2, p3, pn, pn) then we can denote it as
(p1 // p2 // p3 // ... pn-1 // pn)

condition of parallelism

1) Data Dependency Analysis
2) Bernstein's condition
3) Hardware parallelism
4) Software parallelism

(1) Dependency Analysis
→ By analysing dependency graph we can see the opportunity of parallelism
→ If data is dependent then parallelism is not possible

→ process S1 & S2 : if I/P / O/P of S1 will be dependent on I/P/O/P S2.
→ S1 : A = B + C
S2 : D = A + E

1) Dependent on A

5 types of dependency

1) Flow Dependency.

S1: C = A+B , S2: D = C+E

2) Anti Dependency.

S1: D = C+E

S2 C = A+B

3) Output Dependency

S1: C = A+B

S2: C = B+E

4) I/P I/P Dependency

5) Unknown Dependency

(2). Bernstein's condition :-

If P1 & P2 are not (Flow, anti & O/P dependent) then process P1 & P2 are parallel.

(3) H/w parallelism

→ It is defined by machine Architecture & H/w multiplicity

(4). S/w Parallelism

→ It defined by control & data depend of program & is revealed in program flow graph