**Topic:** Parsing Synopsys-Style Synthesis & Timing Logs  
**Total Marks:** 50  
**Tools Allowed:** grep, awk, sort, uniq, cut, head, tail, wc  
**Files Provided:**

* synthesis.log – Synopsys synthesis run log (100+ lines)
* timing.rpt – Static timing report for multiple modules

**Part A — Basic Filtering (10 Marks)**

1. **Extract all ERROR messages** from synthesis.log and save them to errors.txt.  
   *(2 marks)*
2. **Find all warnings about multiple drivers** and print only the **instance names**.  
   *(2 marks)*
3. From timing.rpt, **list all clock names and their periods** in the format:

                 ClockName   Period  (3 marks)

**Part B — Counting & Summarizing (15 Marks)**

1. Count the **number of unique modules** in synthesis.log.  
   *(3 marks)*
2. From timing.rpt, count **how many modules have WNS worse than -0.5 ns**.  
   *(4 marks)*
3. Produce a **table** of ClockName Count showing how many times each clock appears in timing.rpt.  
   *(4 marks)*
4. Count the **total number of setup violations** and **hold violations** separately.  
   *(4 marks)*

**Part C — Data Extraction & Processing (15 Marks)**

1. From timing.rpt, produce a file module\_summary.txt with the following format:

               ModuleName   WNS     TNS     Violations

               top\_level    -0.200  -1.320  8

               core\_module  -0.300  -2.500  12     (5 marks)

1. **Find the worst WNS** in the entire timing.rpt and display:

          ModuleName   WorstWNS   (4 marks)

1. List all **modules where any clock period < 1 ns**, showing the clock name and period.  
   *(3 marks)*
2. Extract only the **error codes** from (TIM-xxx) or (DES-xxx) style messages in synthesis.log.  
   *(3 marks)*

**Part D — Advanced Analysis (10 Marks)**

1. Create a **Critical Path Clock Report** combining both files:
   * From timing.rpt, find the **fastest clock** for each module.
   * Display its **name, period, and WNS**.  
     *(5 marks)*
2. Create an **Error Type Frequency Report** from synthesis.log:

ErrorType                Count

Setup violation          6

Hold violation           4

(5 Marks)