

GANPAT UNIVERSITY

B. Tech. Semester VII Computer Engineering

Remedial Examination November – December 2014

2CE703: Parallel Processing & Architecture

Time: 3 Hours

Total Marks: 70

- Instruction:**
1. Figures to the right indicate full marks.
 2. Each section should be written in a separate answer books.
 3. Be precise and to the point in your answer.

SECTION I

- Que.-1** A Define speedup and ideal speedup. State overhead related. Find speedup for the following. 4
- ```

for(i=id; i<n; i=i+nproc)
{
 //work
}

```
- Take nproc = 10, n=10, 20,30, 100
- B Write a parallel program to add all the elements of integer array of size 350 by using self scheduling and loop splitting. Use total of 7 processes. 8
- OR**
- Que.-1** A Write programs to multiply two integer arrays of size 10 x 10 and 10 x 1. Use 16 processes. Use following methods. 12
- (1) Variation on loop splitting.
  - (2) Variation on self scheduling.
- Que.-2** A Consider X as an integer array of size 101. Write a program which will do the following, 6
- ```

X[0] = X[1]
X[1] = X[2]
.
.
.
X[99] = X[100]

```
- Use block scheduling and two processes to solve.
- B Write a parallel program to find factorial of a given number using self scheduling. (Assume number of process=3). 5
- OR**
- Que.-2** A Consider seven integer arrays A, B, C, D, E, F & X. Let their size be 100. Write a parallel program to achieve following. 6
- ```

X[0] = A[0] + B[0] + C[0] + D[0] + E[0] + F[0]
X[1] = A[1] + B[1] + C[1] + D[1] + E[1] + F[1]
.
.
.
X[99] = A[99] + B[99] + C[99] + D[99] + E[99] + F[99]

```
- Use four processes. Use expression splitting with multiple spin\_lock technique.
- B Write a parallel program to find average deviation of an integer array of size 500 by using loop splitting. Use 10 processes. 5
- Que.-3** A Write all user define functions to solve the race condition. Explain each element of barrier array and different modes of barrier. Also explain when barrier moves from one mode to another. 8
- B Write user define function for the followings. 4
- (1) To create processes (i.e. process\_fork()).
  - (2) To terminate & synchronize processes ( i.e. process\_join()).

SECTION II

- Que.-4 A An examination paper has 5 questions and total number of answer books are 2400. Each question takes 4 minutes to correct. If 10 teachers are employed for correction and each teacher is responsible to correct complete answer book. Calculate the speedup and efficiency. 6
- B Describe branch prediction buffer. 6
- OR
- Que.-4 A Describe branch target buffer. 6
- B Describe architectural classification scheme of computers based on serial versus parallel processing. 6
- Que.-5 A A pipeline processor is going to execute 4 instructions, if division operation takes 3 clock cycles for execution step. Then calculate delay due to resource constraints, for following four instructions. 5
- Instr. 1. INC R1  
Instr. 2. DIV R2,R3,R4  
Instr. 3. ADD R5,R2,R6  
Instr. 4. SUB R3,R5,R7
- B Explain any one configuration of SIMD array processor with figure. 6
- OR
- Que.-5 A Define Internal forwarding and explain three type of forwarding method. 5
- B Explain Hazard detection and resolution as a principle of designing pipeline processors. 6
- Que.-6 A Compare temporal and data parallelism 6
- B Explain parallel random access machine (PRAM) model in detail. 4
- C Give the value of n(word length) and m(bitslice length) for WSBP and WPBS processing. 2

END OF PAPER