Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_

****

**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EC2026** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED MICROPROCESSOR ARCHITECTURE** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | With a neat block diagram summarize the components of a computer system. | CO1 | 12 |
| b. | Compare the features of RISC with CISC Machine. | CO1 | 8 |
| **(OR)** | | | | |
| 2. | a. | Identify 4 factors that define the performance of a computer system. | CO2 | 8 |
| b. | A non pipelined single cycle processor operating at 100 Mhz is converted into a synchronous pipelined processor with 5 stages requiring 2.5 ns, 1.5ns, 2ns, 1.5ns, 2.5ns. respectively. Given latch delay is 0.5 ns. Calculate  i) Pipeline cycle time ii) Non-pipeline execution time  iii) Speed up ratio iv) Pipeline time for 1000 instructions  v) Sequential time for 1000 instructions  vi) Throughput for both processor. | CO2 | 12 |
|  |  |  |  |  |
| 3. | a. | Differentiate between the data and structural hazards that occur due to pipelining. | CO2 | 12 |
| b. | With a practical application justify that pipelining increases the speed of operation of a system. | CO2 | 8 |
| **(OR)** | | | | |
| 4. | a. | Construct the C statements for the following assembly language program statements.  i) addi a,b,10 ii) or a,b,c  iii) andi b,c,10 iv) sub p,q,r | CO2 | 8 |
| b. | Construct the MIPS instructions for  f=(a+b)-(c+d);  d=a+b[8]; | CO2 | 8 |
| c. | Discuss the advantages of python over C programming language. | CO2 | 4 |
|  |  |  |  |  |
| 5. | a. | Discuss the various types of parallel computers with diagrams. | CO1 | 15 |
| b. | Justify that multiprocessor system is best suited for medical Image processing applications. | CO3 | 5 |
| **(OR)** | | | | |
| 6. | a. | Explain the concept of dynamic instruction scheduling using Tomasulo’s approach. | CO2 | 12 |
| b. | Illustrate the register scoreboarding technique of dynamic instruction scheduling. | CO2 | 8 |
|  |  |  |  |  |
| 7. | a. | Compare and contrast the inclusion with coherence property. | CO2 | 10 |
| b. | Differentiate between the types of localities of reference. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | Explain the address translation process with a neat diagram. | CO2 | 10 |
| b. | Apply FIFO replacement algorithm for the reference string  0 1 3 4 0 1 2 3 4 1 2 3 4 5 6 and find the hit ratio for a memory with 3 frames. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Define the purpose of vector processors and list the advantages. | CO1 | 5 |
| b. | Compare the features of VLIW processor with superscalar processors. | CO1 | 15 |