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**University Examinations 2014/2015**

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY AND BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY

**CIT 3229: OPERATING SYSTEMS II**

**DATE: OCTOBER 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Explain the following terms and give appropriate examples of each:
2. SIMD
3. MISD
4. MIMD (6 Marks)
5. Distinguish between location transparency and parallelism transparency in distributed systems. (3 Marks)
6. Distinguish between PRAM and Processor cache consistency models. (4 Marks)
7. Outline the arguments which favour the process pool model and describe its various drawbacks. (4 Marks)
8. Discuss the transaction model. (3 Marks)
9. One essential property of transactions it that they are serializable. Discuss. (3 Marks)
10. One transaction implementation method is the writehead log. Discuss. (3 Marks)
11. Explain using an appropriate diagram, how release consistency is implemented in MUNIN. (4 Marks)

**QUESTION TWO (20 MARKS)**

1. Give a detailed description of semaphores. (5 Marks)
2. Give a detailed explanation of scheduler activations and outline its drawbacks. (5 Marks)
3. Discuss threads in detail. (5 Marks)
4. Describe the advantages and disadvantages of user-space threads implementation. (5 Marks) **QUESTION THREE (20 MARKS)**
5. Define a deadlock. (2 Marks)
6. Describe deadlock avoidance strategy. (4 Marks)
7. Distinguish between WAIT-DIE and WOUND-WAIT algorithms. Use appropriate diagrams to illustrate your answer. (4 Marks)
8. Distinguish between transfer and location policies. (4 Marks)
9. Describe the following distributed computing architectures:
10. 3-tier architecture.
11. N-tier architecture.
12. Space-based. (6 Marks)

**QUESTION FOUR (20 MARKS)**

1. List RPC steps. (5 Marks)
2. Explain how both threads and RPC can be used in distributed systems. (5 Marks)
3. Give a detailed explanation on how an idle workstation can be found in the workstation model. (5 Marks)
4. Discuss the problems of RPC. (5 Marks)