

KATHMANDU UNIVERSITY  
End Semester Examination  
July, 2018

JUL 29 2018

Level : B.E.  
Year : IV  
Time : 2 hrs. 30 mins.

Course : COMP 479  
Semester: II  
F. M. : 40

---

SECTION "B"  
[6Q × 4 = 24 marks]

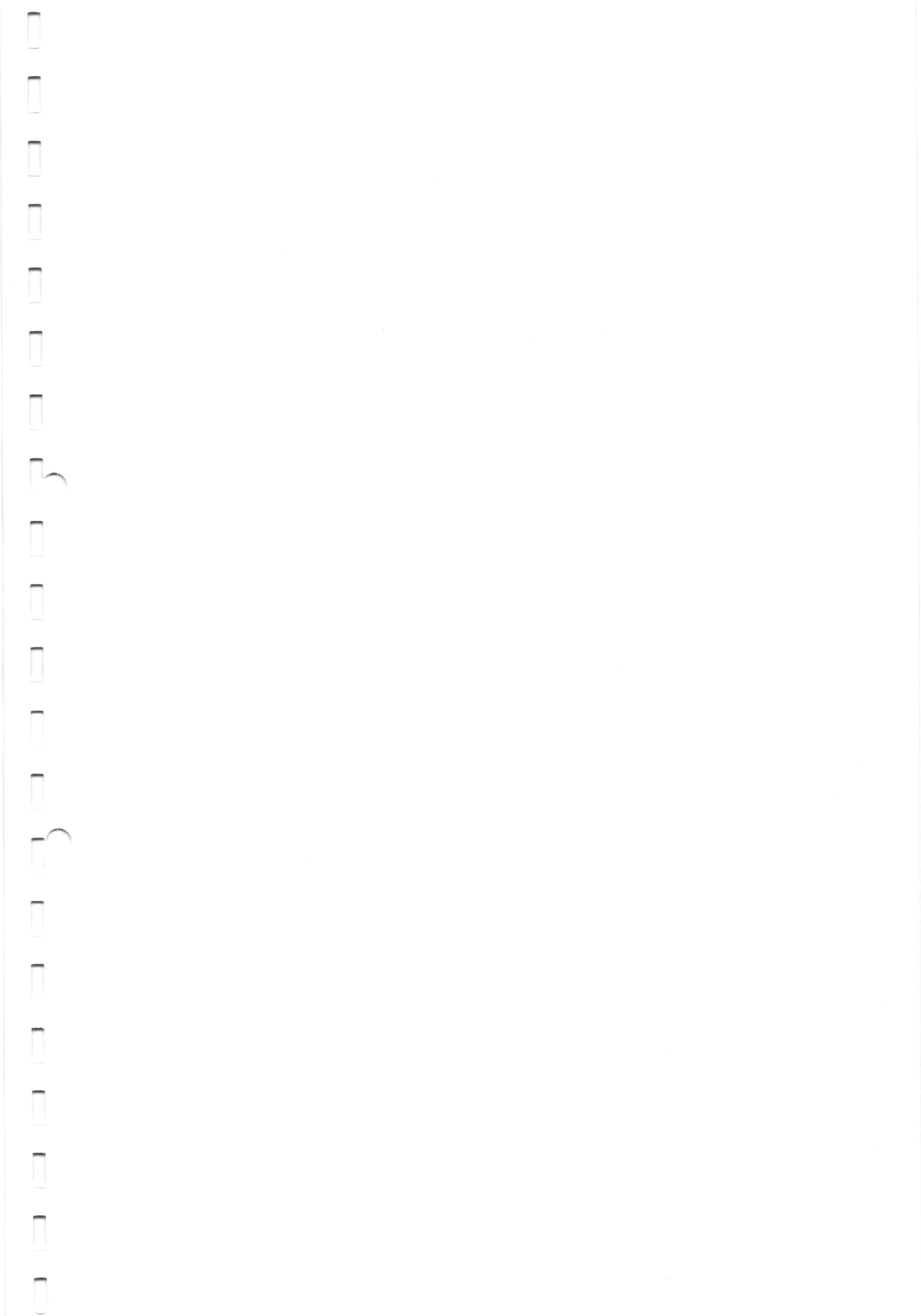
Attempt *ANY SIX* questions.

1. With example, explain different types of query optimization techniques for wireless sensor networks.
2. Define in-network data aggregation. Discuss on pros and cons of in-network data aggregation techniques for wireless sensor networks.
3. What do you mean by routing in wireless sensor networks? With example, explain data-centric routing protocol for wireless sensor networks.
4. What is the importance of middleware for WSN? Briefly explain middleware design principles, issues and challenges.
5. Describe different attacks on secrecy and authentication.
6. With example, explain data privacy and data security in wireless sensor networks.
7. How data is represented in wireless sensor networks (WSN)? Explain different in-networking functions for wireless sensor networks.

SECTION "C"  
[2Q × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Define communication protocol. Compare different standards available for the communication protocols for wireless sensor networks.
9. Wireless sensor networks (WSNs) have diverse area of applications. In the context of Nepal, which one of the most important issues can WSN address? With diagram, explain it.
10. With at least two examples for each, mention different types of experimental tools for WSN. Explain the characteristics of simulator, emulator, and test bed.



KATHMANDU UNIVERSITY  
End Semester Examination  
July, 2018

Mark scored:

Level : B.E.  
Year : IV

Course : COMP 479  
Semester: II

Exam Roll No. : Time: 30 mins.

F. M. : 10

Registration No.:

Date JUL 29 2018

SECTION "A"  
[20 Q × 0.5 = 10 marks]

Pick the Correct Answer.

1. Which is the responsibility of embedded processor?  
[ a ] schedule tasks [ b ] process data  
[ c ] control H/W components [ d ] All
2. Mica2 Mote has \_\_\_\_\_ flash memory.  
[ a ] 64-Kbyte [ b ] 128-Kbyte [ c ] 256-Kbyte [ d ] 32-Kbyte
3. Which is NOT an open source operating system?  
[ a ] TinyOS [ b ] Contiki [ c ] SOS [ d ] LiteOS
4. Borealis is \_\_\_\_\_ data stream engine model.  
[ a ] work-flow based [ b ] relation-based  
[ c ] object-based [ d ] None
5. How many types of sliding window operators are there in continuous query language?  
[ a ] 2 [ b ] 3 [ c ] 4 [ d ] 5
6. Which optimizer is used for load balancing?  
[ a ] local [ b ] global [ c ] neighborhood [ d ] cluster
7. Odd one out from the followings.  
[ a ] LEACH [ b ] TTDD [ c ] PEGASIS [ d ] Directed Diffusion
8. Data aggregation is also known as \_\_\_\_\_.  
[ a ] data fusion [ b ] data compression  
[ c ] both [ d ] none
9. In WSN, when duplicated messages are sent to the same node, it is called as \_\_\_\_\_.  
[ a ] Overlap [ b ] Overhang [ c ] Implosion [ d ] Aggregation
10. The Great Duck Island [Mainwaring et al. 2002] is example of sensor network deployment for \_\_\_\_\_.  
[ a ] environmental monitoring [ b ] agriculture management  
[ c ] personal health monitoring [ d ] intrusion detection
11. Which is NOT the constraint of WSNs?  
[ a ] energy [ b ] memory  
[ c ] unreliable communication [ d ] lower latency

12. Which defense mechanism is used for sinkhole attack?  
[ a ] redundancy checking                      [ b ] authentication  
[ c ] probing                                      [ d ] spread-spectrum
13. Odd one out from the followings.  
[ a ] Unfairness              [ b ] Collision              [ c ] Sybil attack              [ d ] Exhaustion
14. Which attack is not handled by RLEACH [Zhang, '08] protocol?  
[ a ] hello flood              [ b ] node replication      [ c ] replay                      [ d ] Grayhole
15. Agilla is which type of middleware?  
[ a ] message-oriented                              [ b ] re-programming  
[ c ] virtual machine                                [ d ] security
16. Which is the basic principle underlies nesC's design?  
[ a ] reflects TinyOS's design                      [ b ] dynamic language  
[ c ] sub-set of C                                      [ d ] all
17. Shawn is which type of simulator?  
[ a ] firmware level              [ b ] packet level              [ c ] instruction level      [ d ] algorithm level
18. Which one is NOT an Emulator?  
[ a ] NetTopo                      [ b ] Avrora                      [ c ] Mule                              [ d ] MSPSim
19. GSN belongs to which tool?  
[ a ] test-bed                      [ b ] simulator                      [ c ] emulator                      [ d ] data visualization
20. Data aggregation is implemented by how many functions?  
[ a ] 3                                      [ b ] 2                                      [ c ] 4                                      [ d ] 5