



Course Title: *Sensor Networks*
Date: Sun., 05-June-2016

Course Code: *EEEC612*
Allowed time: (3) hrs.

Year: *M.Sc.*
No. of Pages: (2)

Remarks: (answer the following questions... assume any missing data... arrange your answer booklet

Use graphs and examples whenever you have a chance during your answer

Question No. 1: (20) Marks

- a) Using block diagrams, show the construction of a node that is a member in a wireless sensor network. Indicate the purpose of each block.
- b) Compare the node architecture for an IMote based node to a XYZ node.
- c) Deduce the differences between serial peripheral interface (SPI) and the inter integrated circuit (I²C) in terms of : bus size, addressing, speed, and standardization.

Question No. 2: (10) Marks

- a) Estimate the similarities and differences between the media access protocols: CSMA/CD to the CSMA/CA
- b) From your knowledge of the characteristics of a WSN, Deduce the necessary characteristics that should be available in the WSN's MAC protocols.

Question No. 3: (20) Marks

- a) In designing a routing protocol for a wireless sensor network, Estimate the challenging factors that should be overcome. Give a short description for each factor, and suggest solutions for each.
- b) With the aid of sketches explain the SPIN routing protocol
- c) Name the different SPIN family of protocols and deduce the purpose of each one
- d) With the aid of sketches describe an example of data flow in a WSN employing the SPIN protocol