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**POSTGRADUATE INSTITUTE OF MEDICINE**  
**UNIVERSITY OF COLOMBO**

**MSc (BIOMEDICAL INFORMATICS) END OF SEMESTER I**  
**EXAMINATION – MARCH 2019**

**Date:- 15<sup>th</sup> March 2019**

**Time:- 1.00 p.m. – 2.30 p.m.**

**Answer all questions.**

**Answer each question in a separate book.**

**MODULE I**

**Mathematics for Computing and Object Oriented Programming**

1.

- 1.1. Compare and contrast the concepts 'Object' and 'Class' in Object Orient Programming giving suitable examples. (30 marks)
- 1.2. Briefly describe 'Multiple Inheritance' in relation to Java programming language. (30 marks)
- 1.3. Write a pseudo-code to capture body temperature, either in Celsius (C or c) or Fahrenheit (F or f) and convert it to the other unit (e.g. if the temperature was entered in Celsius, the result should be presented in Fahrenheit). The code should be able to handle the exception of either C/c or F/f being entered as the unit of input temperature.  
Formula for temperature conversion is,  $(32^{\circ}\text{F} - 32) \times 5/9 = 0^{\circ}\text{C}$ . (40 marks)

**Module 4**

**Networking, Computer Hardware, Operating Systems and Application Packages**

2.

- 2.1. List the differences between an application software and an operating system. (30 marks)
- 2.2. List the seven (07) layers of Open Systems Interconnection (OSI) model. (15 marks)
- 2.3. Briefly describe the functions of two (02) selected layers listed above in 2.2. (20 marks)
- 2.4. List the components of Communication. (15 marks)
- 2.5. Briefly describe two (02) selected components listed above in 2.4. (20 marks)

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**Module 5**  
**Software Engineering and Software Project Management**

- 3.
- 3.1. Compare and contrast 'Use Case Diagram' and 'Activity Diagram' giving suitable examples. (40 marks)
  - 3.2. Briefly describe a Software Process Model with an example. (10 marks)
  - 3.3. You have been given the responsibility of designing the National Primary Care Information System. Draw a Sequence Diagram to facilitate registering a new patient for a first contact care visit at a district hospital which is connected to the Master Patient Index (MPI). The Sequence Diagram should include a scenario where a patient is not been issued a Personal Health Number (PHN) before.

Assume Sri Lanka is having a MPI with PHN, patient's name, birthday and gender as the main data elements. The MPI can provide patient details to electronic medical records when a record is requested/searched with a PHN number. MPI is also capable of creating a new PHN for patients, who are not registered in the MPI previously and forward the newly created PHN to the medical record system registering the new (previously not-registered) patient. (50 marks)