

THE OPEN UNIVERSITY OF SRI LANKA  
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE  
B.SC. DEGREE PROGRAMME 2011/2012



**NO BOOK TEST: 02**

**CPU3141: DIGITAL COMPUTER FUNDAMENTALS**

**DURATION: ONE AND HALF HOURS ONLY (1.5 HOURS)**

---

**Date: 23<sup>rd</sup> April, 2012**

**Time: 4.00 p.m. to 5.30 p.m.**

---

Answer **ALL** Questions.

**Q1.**

- a. List four (04) properties of **Asynchronous Sequential Circuits**?
- b.
  - i. What is known as **Race Condition**?
  - ii. Give examples to **Noncritical Race Condition** and **Critical Race Condition**.
- c. Briefly explain the design steps of the **Asynchronous Circuits**.

**Q2.**

- a.
  - i. Draw the **Asynchronous counter** of 3 bits using **JK Flip Flops**.
  - ii. Draw the related timing diagram.
- b. What is the function of a **Frequency Divider**?
- c. List five (05) disadvantages of **Asynchronous counters**.
- d. Explain hazards in **Sequential circuits** using an example circuit.

**Q3.**

- a. Describe the components of the **Central Processing Unit**.
- b. What are the steps performed by each instruction of the Central processing Unit?
- c. Describe the **Memory Map** of a sample memory model.
- d. Briefly describe the following;
  - i. Word modules
  - ii. Byte modules

**\*\*\*All Rights Reserved\*\*\***