THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
B.SC. DEGREE PROGRAMME
NO BOOK TEST II – (2016-2017)
CPU3141: DIGITAL COMPUTER FUNDAMENTALS
DURATION: ONE HOUR (1 HOUR)

Date: 04.11.2017 **Time: 9.00 am – 10.00 am**

Answer **All** Questions

Q1.

i. **Registers** are temporary units that store words. Write a brief description about registers.

ii. **Shift registers** operate in four (04) different modes. Name them, and draw **block diagram** of one shift register.

iii. Draw block diagram of **4- bit Synchronous Binary Counter** using **JK flip-flops.**

iv. Draw the block diagram and timing diagram of **4- bit Asynchronous Decode Counter** (MOD-10 counter) using **JK flip flops.**

v. Design a **divide by 128 counter** using **TTL 7493 ICs.** Describe the method and draw the block diagram of the final Circuit.

Q2.

i. What are the steps of **fetch execute cycle.**

ii. Classify following computer storage according to their **speed, capacity, cost** and **volatility/ performance.**

a) Registers
b) RAM
c) CD
d) Hard disk
e) Flash drives
f) External hard disk
g) Cache

iii. Draw a **Dynamic RAM cell** using a **D- flip flop** (name the diagram accordingly).

iv. Explain following combinations of **interaction policies.**

a) Write back with write allocate

b) Write through with no write allocate

v. Draw the **Fuse Map** for the following **PLA Programming Table.**

Product team		Inputs			Outputs	
		A	B	C	(T)	(C)
A B	1	1	1	-	1	-
A C'	2	1	-	0	1	1
B'C'	3	-	0	0	-	1
A'BC	4	0	1	1	-	1
ABC	5	1	1	1	1	-