

Printed Pages : 3

TEC-11

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0306

Roll No.

--	--	--	--	--	--	--	--	--	--

B. Tech.**(SEM. VII) EXAMINATION, 2008-09
DIGITAL SYSTEM DESIGN USING VHDL***Time : 3 Hours]**[Total Marks : 100*

- Note :*
- (1) Attempt all questions.*
 - (2) Each question carries equal marks.*

1 Attempt any **four** parts : **5×4=20**

- (a) Write a behavioural styple of VHDL Code for 4×1 MUX.
- (b) Develop a VHDL code for a JK flip flop using conditional assignment statement.
- (c) What are the various VHDL operators? Explain each with examples.
- (d) Write a short note on VHDL packages and libraries.
- (e) Explain the various VHDL delays.
- (f) Discuss the compilation, simulation and synthesis of VHDL code.

2 Attempt any **four** parts : **5×4=20**

- (a) Develop a VHDL module that describes one bit of a full adder with accumulator.

0306]



1

[Contd..

- (b) Draw the block diagram of the faster multiplier including its state graph.
- (c) Consider a 4x4 array multiplier with 4 bit multiplicand and multiplier with a 8 bit result.
 - (i) Draw the block diagram of the multiplier.
 - (ii) How many AND gates, full adder and half adders did you use?
- (d) Design an SM block that has 3 input variables (a,b,c) 4 outputs (w,x,y,z) and two exit paths. For this block output Z is always 1 and w is 1 if a and b both are 1. If C=1 and a=0, y=1 and exit path 1 is taken. If C=0 and a=1, x=1 and exit path 2 is taken.
- (e) Explain a method used to realize SM charts with an example.
- (f) Write a short note on Xilinx 3000 series FPGAs.

3 Attempt any **two** parts : **10×2=20**

- (a) What are the various floating point operations? Draw and explain the flow chart for floating point multiplication.
- (b) Two floating point numbers are added to form a floating point sum:

$$\left(F_1 \times 2^{E_1}\right) + \left(F_2 \times 2^{E_2}\right) = F \times 2^E$$

Assume that F_1 and F_2 are normalized and the result should be normalized. List the steps to carry out floating point addition including all special cases.

- (c) Write a short note on one hot state assignment.



Attempt any **two** parts :

10×2=20

- (a) Draw and explain SM chart for simplified 486 bus interface.
- (b) Write a VHDL code for simple 6116 state RAM model.
- (c) Design the interfacing between memory to a microprocessor bus.

5 Attempt any **two** parts :

10×2=20

- (a) Explain the UART block diagram with SM chart for the receiver.
- (b) Write various control instructions of 6805 microcontroller. Give one example of each instruction.
- (c) Design the CPU of 6805 microcontroller with the suitable instructions.