Total No. of printed pages = 3

Co-605/VLSI&ES/6th Sem/2016/N

VLSI AND EMBEDED SYSTEMS

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Question No. 5 is compulsory.

Answer any *three* from the rest.

1. (a) Mention different design styles used for VLSI and describe the semi-custom IC design style briefly with the help of diagram. 2+8=10

   (b) Describe the use of n-MOS and p-MOS transistors as pass transistors and list out the important features of each. 6

   (c) Describe the placement step in physical design. 4

[Turn over

2. (a) Draw the basic block diagram of an embeded system and explain the functioning of each block. 8

(b) Mention the different examples of embeded system. 2

(c) Compare the Von-Neumann architecture and Harvard architecture with proper diagram and features. 10

3. (a) Implement 2-input XNOR gate using c-MOS logic. 4

(b) Write a short note on floor planning. 6

(c) Implement the following Boolean logic using n-MOS logic :

$f(x, y, z, w) = w + x\,(y + z)$ 6

(d) Compare between semi-custom and full-custom IC design styles. 4

4. (a) What are the types of embeded microprocessor architecture and compare the salient features of each type. 2+8=10

(b) Draw the circuit diagram of inverters in various integration technologies and explain the operation of n-MOS inverter with resistive load. 4+6=10

5. (a) Mention the different types design methodologies for an embeded system.

(b) Define LUT and mention its use.

(c) What is the function of I/O pads in an integrated circuit ?

(d) Implement the function $f = \overline{A}M$ c-MOS logic.

(e) What do you mean by physical domain description of an integrated circuit ?

$5 \times 2 = 10$