No. of Printed Pages : 3

BIEE-017

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

00626

Term-End Examination

June, 2014

BIEE-017 : DIGITAL ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions from question no. **1** to **10**. All questions carry equal marks. Missing data may be suitably assumed.*

1. Draw and give the expression for a 4-bit parallel subtractor using full adder. *10*

2. Design a synchronous mod-5 counter using J-K flip-flops. *10*

3. Draw the circuit for bipolar RAM cell and explain its operation in brief. *10*

4. (a) Determine minimal sum of product form for the following multiple output system using K-map :

$F = (A, B, C, D, E) =$

$\sum m(0, 1, 2, 3, 6, 7, 14, 15, 17, 19, 31)$

(b) Realize the following function using EX-OR and EX-NOR gates :

$F = AB\bar{C}\bar{D} + A\bar{B}\bar{C}D + \bar{A}\bar{B}CD + \bar{A}BC\bar{D}$

5×2=10

5. (a) Using four-input multiplexers, implement the following functions :

(i) $F(A, B, C) = \sum m(0, 2, 3, 5, 7)$ control variables A and B.

(ii) $F(A, B, C) = \sum m(1, 3, 4, 6, 7)$ control variables B and C.

(b) Prove the following identity :

$$X \cdot Y + \overline{X} \cdot Z + Y \cdot Z = X \cdot Y + \overline{X} \cdot Z$$

(c) Explain the operation of an Encoder and list some of its applications. $5+2\frac{1}{2}+2\frac{1}{2}=10$

6. With a neat diagram describe the internal architecture of 8085. State the function of each block. *10*

7. With suitable examples explain the various addressing modes available in the instruction set of 8086. *10*

8. Explain the following assembler directives : $2\times5=10$

(a) ENDS

(b) DQ

(c) DT

(d) ENDP

(e) DD

9. (a) What is meant by the vectored and non-vectored interrupts ? List out all the vector interrupts of 8085 and give their vector addresses. $5\times2=10$

(b) If 8085 is currently executing an interrupt service routine and another interrupt comes, then on what condition will this new interrupt be served ?

10. (a) What is the difference between 8086 and 8088 ?

(b) How much memory can be attached to 8086 ? Justify the result.

(c) Specify the memory location and its contents after the following instructions are executed :

```
MVI B, F7H
MOV A, B
STA XX75H
HLT
```

(d) Specify the contents of registers A, D and HL after execution of the following instructions :

```
LXI H, XX90H
SUB A
MVI D, OFH
LOOP : MOV M, A
INX H
DCR D
JNZ LOOP
HLT
```

$2\frac{1}{2} \times 4 = 10$
