

**1BIT5 - Digital Electronics And Microprocessor Paper-V**

P. Pages : 2

GUG/S/19/1424

Time : Three Hours



Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
  2. Draw neat and labelled diagram and use supporting data wherever necessary.
  3. Avoid vague answers and write specific answer related to questions.

1. Either
- a) Perform the following subtraction using 1's complement method. 8
- |                |                |
|----------------|----------------|
| i) 11010-10110 | ii) 10111-1110 |
| iii) 1010-1111 | iv) 11011-100  |
- b) Explain NAND and NOR gate as a universal gates. 8

**OR**

- c) What is Hexadecimal Number system? State its advantages over other system. 8  
Convert the following.
- |                           |                              |
|---------------------------|------------------------------|
| i) $(74)_{10} = (?)_{16}$ | ii) $(43.2)_{10} = (?)_{16}$ |
|---------------------------|------------------------------|
- d) Explain the following codes. 8
- |                     |                  |
|---------------------|------------------|
| i) Excess – 3 code. | ii) Parity code. |
|---------------------|------------------|
2. Either
- a) What is Half Adder? State its limitation. Explain the operation of 4-bit 2's complement Adder/ subtractor with diagram. 8
- b) Map the following expression and simplify using K-map. 8
- |  |
|--|
| i) $Y = \overline{A}B\overline{C}D + ABCD + ABC\overline{D} + A\overline{B}CD$ |
| ii) $Y = \overline{[A \cdot (\overline{AB})]} [B \cdot (\overline{AB})]$       |

**OR**

- c) Explain the different laws and identifiers of Boolean Algebra. 8
- d) Simplify the following expression using Boolean laws and then draw simplified logic diagram for it. 8
- |  |
|--|
| i) $Y = \overline{A}B\overline{C} + \overline{A}B\overline{C} + \overline{A}B\overline{C} + A\overline{B}C$  |
| ii) $Y = \overline{A}B\overline{C}D + \overline{A}B\overline{C}D + \overline{A}B\overline{C}D + \overline{A}B\overline{C}D + \overline{A}B\overline{C}D$ |
3. Either
- a) What is UP/DOWN counter? Explain the construction and working of 4-bit down counter with timing diagram. 8
- b) What is RSFF? Draw a logic symbol for RSFF. Explain the construction and working of clocked RSFF. Draw its timing diagram. 8

**OR**

- c) Explain the construction and working of 4-bit SISO shift register. **8**
- d) Draw the logical diagram of JKMS flip – flop and explain how it can be used to avoid race around condition. **8**

**4.** Either

- a) What are the Assembler directives and operators? State any six assembler directives and explain. **8**
- b) Draw the block diagram of 8086 microprocessor and explain. **8**

**OR**

- c) What is status flag? Explain flag register format of 8086  $\mu$ P. **8**
- d) State and explain any four logical instructions used in 8086  $\mu$ P with example. **8**

**5.** Solve all the questions.

- a) Give the symbol, Boolean equation and truth Table for following logic gates. **4**
  - i) AND ii) NOT
  - iii) OR iv) EX-NOR
- b) Write a short note on encoder. **4**
- c) Explain the working of 4-bit Ring counter with its proper logic diagram-Draw its timing diagram. **4**
- d) Write a program for subtraction of two numbers on 8086  $\mu$ P. **4**

\*\*\*\*\*