

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-I & II (NEW) EXAMINATION – WINTER 2015

Subject Code: 2110016

Date: 29/12/2015

Subject Name: Basic Electronics

Time: 10:30am to 01:00pm

Total Marks: 70

Instructions:

1. Question No. 1 is compulsory. Attempt any four out of remaining Six questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 Objective Question (MCQ)

(a)

07

1. Which component has a positive and a negative side?
(a) A potentiometer (b) A fuse (c) A resistor (d) A battery
2. To increase the current capacity of a cell, several cells should be connected in:
(a) parallel (b) series (c) parallel resonant (d) series resonant
3. Which tolerance rating would a high-quality resistor have?
(a) 5% (b) 10% (c) 20% (d) 0.1%
4. What does a common multimeter measure?
(a) Resistance, capacitance and inductance (b) Voltage, current and resistance
(c) Resistance and reactance (d) SWR and power
5. Potential difference is measured by means of:
(a) a wattmeter (b) an ohmmeter (c) a voltmeter (d) an ammeter
6. A resistor in a circuit becomes very hot and starts to burn. This is because the resistor is dissipating too much:
(a) voltage (b) resistance (c) current (d) power
7. In most of modern IC op-amps, the 741 requires _____ power supplies
(a) 1 (b) 2 (c) 3 (d) 4

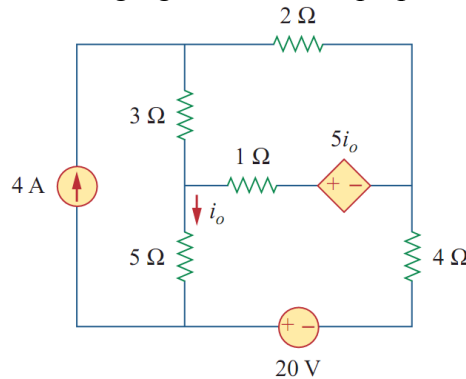
(b)

07

1. Electrical energy at a frequency of 1454 Hz is in what frequency range?
(a) Radio (b) Audio (c) High (d) Super-high
2. A circuit designed to increase the level of its input signal is called:
(a) an amplifier (b) a modulator (c) an oscillator (d) a receiver
3. In a frequency modulation receiver, the _____ is in between the antenna and the mixer.
(a) audio frequency amplifier (b) high frequency oscillator
(c) intermediate frequency amplifier (d) radio frequency amplifier
4. All arithmetic operation take place in the _____ of a computer
(a) CPU (b) ALU (c) ROM (d) Microprocessor
5. The logic gate which detects equality of two bits is
(a) EX-OR (b) EX-NOR (c) NOR (d) NAND
6. The basic building block for a logical circuit is _____
(a) A flip flop (b) A logical gate

- (c) An Adder (d) None of the above
7. A control system in which the control action is somehow dependent on the output is known as
- (a) closed loop System (b) semi closed loop system
(c) open system (d) None of the above

- Q.2** (a) Explain in brief about Dot Convention. **03**
 (b) Write a short note on Oscilloscope. **04**
 (c) For the circuit shown in following figure, use the superposition theorem to find i_o . **07**



- Q.3** (a) Classify the controlled source and draw schematics for each. **03**
 (b) Explain in brief following properties of operational amplifier. **04**
 (a) Input Resistance (b) Open Loop Voltage gain
 (c) CMRR (d) Input Offset Voltage
 (c) Write about ideal operational amplifier with necessary circuit diagram and equations. **07**
- Q.4** (a) Why differential amplifier is necessary? **03**
 (b) Obtain a minimum Boolean expression for $F(A,B,C,D) = \sum m_i ((1, 3, 4, 5, 6, 7, 10, 12)$ **04**
 (c) For the logic expression $Z = \overline{AB} + A\overline{B}$ **07**
 (i) Obtain the truth table.
 (ii) Name the operation performed
 (iii) Realize this operation using AND, OR, NOT gates
 (iv) Realize Same operation using only NAND gates
- Q.5** (a) Classify display devices. **03**
 (b) Classify network topologies and draw each one of them. **04**
 (c) Draw and explain microprocessor system architecture. **07**
- Q.6** (a) Draw block diagram of Pulse code Modulation. **03**
 (b) Explain in brief cellular concept in mobile radio system. **04**
 (c) State the need of modulation and what are the other advantages of modulation in communication system? **07**
- Q.7** (a) Define the following terms: **03**
 (a) Reflection (b) Directivity (c) Isotropic Radiator
 (b) What is transmission medium? What are the different types of transmission medium? **04**
 (c) Explain digital control system with necessary block diagrams. **07**