

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-I & II (NEW) EXAMINATION – SUMMER-2019

Subject Code: 2110016

Date: 07/06/2019

Subject Name: Basic Electronics

Time: 10:30 AM TO 01:00 PM

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 (a) Find correct option

07

1. Which resistor is smallest in size ?
(a) $1000\text{ M}\Omega$, 100 W (c) $100\text{ K}\Omega$, 1 W
(b) $1000\text{ K}\Omega$, 0.5 W (d) $10\text{ }\Omega$, 1 W
2. Capacitor $C_1=C_2=C_3= 0.1\text{ }\mu\text{F}$ connected in parallel. This parallel module is connected in series with $C_4=0.3\text{ }\mu\text{F}$. what is equivalent capacitance
(a) $0.3\text{ }\mu\text{F}$ (c) $0.15\text{ }\mu\text{F}$
(b) $0.6\text{ }\mu\text{F}$ (d) $0.0\text{ }\mu\text{F}$
3. OPAMP 1 having higher value of CMRR compare to OPAMP 2. Which OPAMP is better ?
(a) OPAMP 1 (c) OPAMP 2
(b) Both (d) better OPAMP cannot checked with CMRR
4. EX OR gate having 4 inputs $A=B=C=1$, $D=0$ Output $Y=$ ____
(a) 0 (c) 1
(b) Don't care (d) EX OR gate with 4 inputs is not possible.
5. Ideal current source having source resistance =_____
(a) 0 (c) $1\text{ }\Omega$
(b) $100\text{ K}\Omega$ (d) infinity
6. OP AMP can Perform
(a) NOT gate logic (c) Integration Operation
(b) LOG operation (d) All of above
7. Following of which digital signal is one of the type of impulse signal?
(a) $X(n)=0$, for all values of n
(b) $X(n)=1$, for all values of n
(c) $X(n)=1$ for $n=4$, $X(n)=0$ elsewhere
(d) $X(n)=0$ for $n < 0$, $X(n)=1$ for $n \geq 0$

- (b) Do as directed 07
1. Define : Resistivity
 2. List out all digital modulation systems. List out all Analog modulation systems
 3. Define CMRR, PSRR for OPAMP
 4. Define Noise in communication.
 5. Delta connected resistors having equal value of 3Ω . Find all equivalent star connected resistance values.
 6. Which theorem can apply in NODE analysis and MESH analysis for network solution.?
 7. List out any five OPAMP applications.
- Q.2** (a) Write characteristic of IDEAL OPAMP. 03
- (b) What is universal GATE ? Make EX-OR gate using one of the universal gate. 04
- (c) Explain the equivalent circuit of OP-AMP with suitable diagram. Explain the inverting and NON inverting operation of OP-AMP 07
- Q.3** (a) What is slew rate in OP AMP. Its value should be higher or lower for OPAMP to behave near to ideal.? 03
- (b) What is K MAP. Reduce the given function using K-map. 04
 $F(A,B,C,D) = \sum m_i (0, 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 14)$
- (c) state the NORTON's theorem . Find out current through 40Ω load resistor from node A to node B by using it. (Fig 1) 07
-
- Fig (1)
- Q.4** (a) Define potential, potential difference, current. 03
- (b) How to use ammeter and voltmeter to read current and voltage.? List out sensor to measure temperature. 04
- (c) State superposition theorem. Explain by taking a example. 07
- Q.5** (a) Compare LAN, MAN and WAN 03
- (b) State and explain De Morgan's Theorem with truth table 04
- (c) OP-AMP with non-inverting configuration $V_{cc} = \pm 15 \text{ V}$, input voltage $= 1 \text{ V}$, input resistance $R_i = 1 \text{ K}\Omega$. 07
 What is the value of output voltage if (1) feedback resistance $R_f = 0 \Omega$
 (2) feedback resistance $R_f = \text{infinity } \Omega$ (3) feedback resistance $R_f = 1 \Omega$
- Q.6** (a) Define AM, FM and PM. 03
- (b) Draw and explain functional block diagram of a signal processing system 04
- (c) Explain sampling, quantization and coding process for PCM . 07
- Q.7** (a) Compare open loop and close loop system 03
- (b) Write short note on Cellular communication system 04
- (c) Explain any seven rules for block diagram reduction of control system with necessary diagram. 07
