Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–2nd EXAMINATION– SUMMER 2018

Subject Code: 2110016 **Date: 22-05-2018**

Subject Name: Basic Electronics

Time: 02:30 pm to 05:00 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) Choose the appropriate option from the following **07**

1. For the operational amplifier with inverting configuration the change in the phase of the output voltage is _____.
(a) 180^o , (b) 90^o ,(c) 270^o , (d) 45^o

2. The output of a logic gate is '1' when all its input are at logic 0.The gate is either:
(a) NAND or an EX OR gate (b) NOR or an EX-NOR gate
(c) an OR or an EX NOR gate (d) an AND or an EX-OR gate

3. The time period which has highest frequency is
(a) 0.02 sec, (b) 0.01 sec ,(c) 1 sec , (d) 2 sec

4. The network elements such as resistances, capacitances, inductances are not physically separable, then this network elements are known as
(a) Lumped Network (b) Distributed Network
(c) Unilateral Network (d) Bilateral Network

5. To increase the voltage capacity of a cell, several cells should be connected in:
(a) parallel (b) series (c) parallel resonant (d) series resonant

6. In TV transmission, picture signals are transmitted by:
(a) AM (b) FM (c) PCM (d) None of the above

7. An automatic toaster is a _____ loop control system.
(a) Open (b) Closed (c) Semi-closed (d) any of the above.

(b) Choose the appropriate option from the following **07**

1. An ideal voltage source should have
(a) large value of EMF (b) Small value of EMF
(c) Zero Source Resistance (d) Infinite Source Resistance

2. Superposition theorem can be applied only to circuits having
(a) resistive elements (b) passive elements
(c) Non-linear elements (d) linear bilateral elements.

3. CMRR of an OP-AMP is
(a) Finite (b) Infinite (c) Zero (d) Unity

4. A gate in which all inputs must be low to get high output is called
(a) AND (b) NAND (c) NOT (d) NOR

5. PPM is a _____.
(a) linear modulation technique (b) Analogue modulation technique
(c) digital modulation technique (d) None of the above

6. Which of the following elements is not used in an automatic control system?
(a) sensor (b) Error detector
(c) oscillator (d) final control element

7. Kirchhoff's voltage law is not applicable to circuits with
(a) Lumped parameters (b) Passive elements
(c) Distributed parameters (d) Non-linear elements

Q.2	**(a)**	State and explain Kirchhoff's law.	**03**
	(b)	Write a short note on CRO.	**04**
	(c)	Determine the voltage across the 20 ohm resistor in the circuit shown in figure (1), with the application of superposition theorem.	**07**

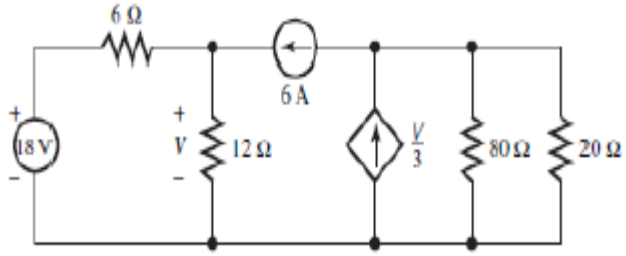

Figure (1)

Q.3	**(a)**	Explain NOR gate as a universal gate.	**03**
	(b)	Explain in brief following properties of OP-AMP (a) Input Resistance (b) Open loop voltage gain (c) CMRR (d) Input off set voltage	**04**
	(c)	Explain the equivalent circuit of OP-AMP with suitable diagram. Explain the inverting and non-inverting operation of OP-AMP.	**07**
Q.4	**(a)**	State and explain De Morgan's Theorem with truth table.	**03**
	(b)	Reduce the given function using K-map. $F(A,B,C,D) = \Sigma m_i (1,3,5,7,8,9,13,14)$.	**04**
	(c)	Classify the types of Computer network? Explain each one of them in brief.	**07**
Q.5	**(a)**	Give the classification of signals.	**03**
	(b)	Classify network topologies and draw each one of them.	**04**
	(c)	Draw and explain functional block diagram of a signal processing system	**07**
Q.6	**(a)**	Draw the block diagram of pulse code modulation.	**03**
	(b)	Write short note on Cellular communication system.	**04**
	(c)	Explain Radio receiver and explain tunnel radio frequency receiver and super heterodyne receiver.	**07**
Q.7	**(a)**	State and explain Thevenin's theorem.	**03**
	(b)	Compare open loop and close loop system.	**04**
	(c)	Explain digital control system with necessary block diagrams.	**07**

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