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Total Number of Pages : 02

B.Tech  
BE2101

2<sup>nd</sup> Semester Back Examination 2017-18  
BASIC ELECTRONICS

BRANCH : AEIE, AERO, AUTO, BIOMED, BIOTECH, CHEM, CIVIL, CSE, ECE, EEE, EIE, ELECTRICAL, ENV, ETC, FASHION, FAT, IEE, IT, ITE, MANUFAC, MANUTECH, MARINE, MECH, METTA, METTAMIN, MINERAL, MINING, MME, PE, PLASTIC, TEXTILE

Time : 3 Hours

Max Marks : 70

Q.CODE : C1179

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Answer all parts of a question at a place.

- Q1** Answer the following questions : (2 x 10)
- a) What is the meaning of CMRR of an Op-amp? (2)
  - b) Write down the advantages of a negative feedback amplifier. (2)
  - c) Derive the expression for collector current for a CE transistor. (2)
  - d) The gain of a certain amplifier is 30dB. Express it numerically. (2)
  - e) Write down the four applications of a diode. (2)
  - f) Realize a NOR gate from NAND gate. (2)
  - g) Convert the decimal number -32 to its equivalent and 2's complement form. (2)
  - h) How BJT acts as a switch? (2)
  - i) State the characteristics of an ideal op-amp. (2)
  - j) Draw the block diagram of a 8X1 MUX. (2)
- Q2**
- a) Explain the operation of a p-n junction diode with V-I characteristics. (5)
  - b) Explain the operation of Full-wave Rectifier (Center Tapped Type) with input-output waveforms. (5)
- Q3**
- a) Draw circuits for both inverting and non-inverting amplifier using op-amp. Derive the expression for the gain of an inverting amplifier. (7)
  - b) Draw the block diagram of function generator and explain its operation. (3)
- Q4**
- a) What are the conditions of oscillation? Derive the expression of frequency of oscillation and also the condition of oscillation in a RC phase shift oscillator. (5)
  - b) What is the input impedance of an ideal CRO? Why? Explain CRO as a voltmeter. (5)
- Q5**
- a) The open loop gain of an amplifier changes by 5%. If 10dB negative feedback is applied, calculate percentage change of the closed loop gain? (5)
  - b) What is active, saturation and cut-off region of a transistor? Explain with necessary diagram. (5)

**Q6 a)** Implement the following function using NOR gate only **(7)**  
 $F(A, B, C, D) = (A+C)(B+D)$ .

**b)** Draw the physical structure, drain characteristics, transfer characteristics and circuit symbol of an n-channel depletion type MOSFET. **(3)**

**Q7** A crystal diode having an internal resistance  $r_i = 10\Omega$  is used for center tapped full wave rectification. If the applied voltage is  $V = 50 \sin(\pi t)$  and the load resistance is  $R_L = 1K\Omega$ , determine the followings **(10)**

i) Draw the input and output voltage and current waveforms

ii) The efficiency of the circuit.

iii) The ripple factor.

**Q8 Write short answer on any TWO : (5 x 2)**

a) CRT

b) SR Flip-Flop

c) Zener diode as voltage regulator

d) Static and Dynamic Memories