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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?
  - b) Write down the advantages of a negative feedback amplifier.
  - c) Derive the expression for collector current for a CE transistor.
  - d) The gain of a certain amplifier is 30dB. Express it numerically.
  - e) Write down the four applications of a diode.
  - f) Realize a NOR gate from NAND gate.
  - g) Convert the decimal number -32 to its equivalent and 2's complement form.
  - h) How BJT acts as a switch?
  - i) State the characteristics of an ideal op-amp.
  - j) Draw the block diagram of a 8X1 MUX.
- 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)
- Draw the input and output voltage and current waveforms
  - The efficiency of the circuit.
  - The ripple factor.
- Q8** Write short answer on any TWO : (5 x 2)
- CRT
  - SR Flip-Flop
  - Zener diode as voltage regulator
  - Static and Dynamic Memories