BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER : I**
BRANCH: ECE/CSE/IT/EEE **SESSION : MO/19**

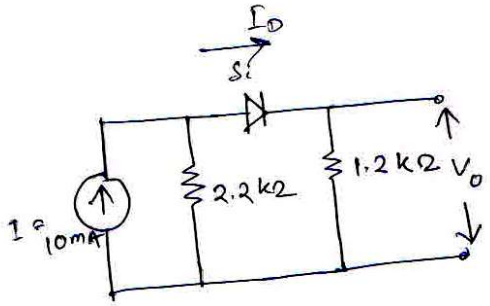
SUBJECT: EC101 BASIC OF ELECTRONICS ENGINEERING

TIME: 3.00Hrs. **FULL MARKS: 50**

INSTRUCTIONS:
1. 1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Write down the expression for diode current. Draw the V-I characteristics of a silicon diode. Compare it with the ideal diode. [5]

Q.1(b) Calculate V_0 and I_D for the following Circuit. [5]



Q.2(a) Define operating point. Write down it's significance in transistor operation. With suitable diagram explain how the operation point shifts with base current, collector resistance and biasing voltage individually in a fixed bias configuration. [5]

Q.2(b) With suitable diagram explain the construction and working of depletion type MOSFET. Compare it with enhancement type MOSFET. [5]

Q.3(a) Define barkhausen criteria for sustained oscillation. Draw the circuit diagram of RC phase shift oscillator using OAAMP. Justify how barkhausen criteria is achieved in it. [5]

Q.3(b) Write down four characteristics of Ideal OPAMP. Draw the circuit diagram of a non-inverting amplifier using OPAMP. Derive the expression of gain. [5]

Q.4(a) Realize the following using NAND gates only. [5]
Y=AB'C+A'BC+ABC

Q.4(b) Write down the truth table for a full adder. Realize the full adder circuit using basic logic gates. [5]

Q.5(a) Draw the basic block diagram of a communication system. Explain the individual block. [5]

Q.5(b) The maximum and minimum amplitude of the amplitude modulated wave is 1.75V and 0.25V respectively. Calculate the modulation index. If the carrier wave power is 400W, calculate the single sideband power and total power of the modulated wave. [5]

:::::06/12/2019E::::