Sub Code:REC309

Paper Id: 130304 Roll No:

B.TECH
(SEM-III) THEORY EXAMINATION 2019-20
ANALOG AND DIGITAL ELECTRONICS

Time: 3 Hours *Total Marks: 70*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

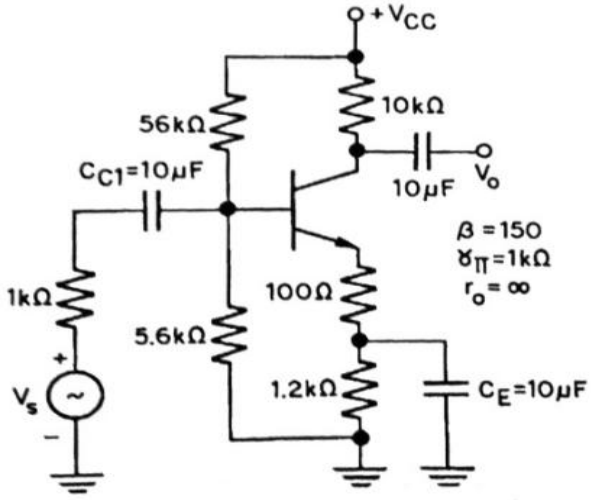
1. **Attempt all questions in brief.** **7 x 2 = 14**

a. What is LED?
b. What is combinational circuit and sequential circuit?
c. How oscillators generate sustained oscillation?
d. What is the effect of capacitors in low frequency response?
e. What is volatile memory?
f. What is the basic difference between latch and flipflop?
g. Explain universal shift register.

SECTION B

2. **Attempt any three of the following:** **7 x 3 = 21**

a. Explain Tunnel diode. Draw its constructional details and characteristic curve.
b. For the BJT amplifier circuit shown in figure determine:
   (i) The lower half frequency due to coupling capacitor (i) C_{c1} (ii) C_E
   (ii) The overall lower cut off frequency of the amplifier circuit



c. Explain Wein bridge oscillator and also derive its frequency of oscillation.

d. Implement the following Boolean function using SOP and draw the logic gates
   F(A, B, C,)= πM (2,4,5,6)

e. With the neat logical diagram and timing diagram, explain the operation of 3 bit binary ripple up/down counter constructed using JK Flip flop

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SECTION C

3. **Attempt any one part of the following:** **7 x 1 = 7**

(a) Explain power device SCR with its characteristics and applications. Compare it with Transistor.

(b) What is a Schottky diode? Explain its characteristic and applications.

4. **Attempt any one part of the following:** **7 x 1 = 7**

(a) Explain voltage series and current shunt feedback with the help of circuit and block diagram and derive the relation for gain and input/output impedance with and without feedback.

(b) Explain Hartley oscillator and also determine its frequency of oscillation.

5. **Attempt any one parts of the following:** **7 x1 = 7**

(a) Explain multistage amplifier for RC coupled indicating its gain.

(b) Discuss the high frequency equivalent circuit of FET and hence derive gain bandwidth product for any one configuration.

6. **Attempt any one parts of the following:** **7 x1 = 7**

(a) Convert SR Flip Flop to JK Flip flop? Draw the transition table in support of your answer.

(b) What are Multiplexer? Design a 8 to 1 MUX using two 4 to 1 MUX.

7. **Attempt any one parts of the following:** **7 x1 = 7**

(a) Explain ROM with the help of block diagram? Compare RAM with ROM.

(b) Design a combinational circuit using PAL for following Boolean Expression

$X(A,B,C,D)=\sum(7,8,9,10,11,12,13,14,15)$

$Z(A,B,C,D)=\sum(1,2,8,12,13)$