Printed pages: 02 Sub Code: REC309

Paper Id: 3 0 8 2 Roll No. | | | | | | | | | | |

B.Tech

(SEM III) THEORY EXAMINATION 2017-18

ANALOG & DIGITAL ELECTRONICS

Time: 3 Hours Total Marks: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

   a. What is SCR draw its characteristic?
   b. Why germanium is not used for the construction of photo diodes?
   c. What is a cascade amplifier?
   d. What are the drawbacks of negative feedback?
   e. Encode the decimal numbers 43 and 295 into BCD code.
   f. For the logic operation $f = A\overline{B}D + \overline{A}BC + B\overline{C}\overline{D}$ obtain the standard POS equation.
   g. What is the difference between EPROM and EEPROM?

SECTION B

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

   a. Explain basic structure of LED, its operation. Also calculate the LED voltage drop and current.
   b. Explain Common collector amplifier and find its input resistance, voltage and current gain.
   c. Discuss the effect of negative feedback of voltage gain , stability , distortion, bandwidth, output and input impedance of an amplifier in series shunt configuration.
   d. Realize a JK flip flop using NAND and NOR gate. Also give their truth table and wave forms.
   e. Explain universal shift registers in detail with the help of proper diagrams.

SECTION C

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

   (a) Explain tunnel diode and phenomenon of tunneling. Also give the equivalent circuit, characteristic of tunnel diode and application.
   (b) Explain construction and working of Schottky diode. Draw its characteristic and write merits and demerits and applications.

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

   (a) What do mean by multistage amplifier? And derive the relation for the product of gain bandwidth.
   (b) Explain common emitter configuration as an amplifier and derive the relations for frequency response.

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

   (a) Sketch the circuit of Wien bridge. Derive the expression for frequency of oscillation. Does the oscillation take place with sustained oscillation?

(b) What is a clap oscillator and its frequency of oscillation?
Determine the frequency of oscillations of a clap oscillator if the component values are as follows.
$C_1 = 100pf$, $C_2 = 1.2\ nf$, $C_3 = 12pf$ and $L_3 = 8\mu H$.

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

(a) Design a half adder using multiplexer.

(b) Explain multiplexer and demultiplexer. Design a 32:1 multiplexer using two 16:1 multiplexer.

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

(a) Differentiate between synchronous and asynchronous digital sequential circuit and design MOD-5 counter.

(b) Give the classification of semiconductor memory and explain the function of PLA in detail.