Printed Pages: 02 **Sub Code: NEC409A**

Paper Id: 131427 **Roll No.** | | | | | | | | | | |

(SEM. IV) THEORY EXAMINATION 2017-18
ANALOG AND DIGITAL ELECTRONICS

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections.
2. Assume any missing data.

SECTION A

1. Attempt *all* questions in brief. **2 x10 = 20**

a. What are the different materials used for the manufacturing of LED?
b. Explain V-I characteristics of tunnel diode.
c. What is the necessity of frequency response analysis?
d. What are the advantages of introducing negative feedback?
e. State the Barkhausen criterion for an oscillator.
f. Define piezoelectric effect.
g. Compare combinational and sequential logic circuits.
h. What is the difference between Decoder and Demultiplexer.
i. Write short note on Schmitt trigger with diagram?
j. Explain PROM in brief.

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a. Explain the principle and working of light emitting diode (LED) with V-I characteristics. An LED is connected across a voltage source of +10 V through a series resistance of 820 Ω. Calculate the LED current. Assume the voltage drop across an LED of 15 V.
b. Distinguish between current feedback and voltage feedback with appropriate circuit /block diagram.
c. Explain Hartly oscillator and derive the equation for oscillation?
d. Explain the operation of master slave flip flop and show how the race around condition is eliminated.
e. Explain the organization of RAM with the help of neat diagram. Also describe the switching regulators.

SECTION C

3. Attempt any one parts of the following: **10 x 1 = 10**

a. What is photodiode? Draw typical I-V characteristic curves at two illumination levels and explain how does it work as a photo resistor?

b. With the help of output characteristics explain how a transistor is used as a switch.

4. Attempt any one parts of the following: **10 x 1 = 10**

a) Draw and explain high frequency equivalent circuit of the typical RC coupled common emitter amplifier.

b) Describe the properties of series-shunt and shunt-shunt feedback amplifier. List five characteristics of an amplifier which are modified by negative feedback.

5. Attempt any one parts of the following: 10 x 1 = 10

a) Draw a neat diagram of phase shift oscillator using BJT. Derive an expression for its frequency of oscillation.

b) Explain the properties of a quartz crystal which are responsible for its use in an oscillator.

6. Attempt any one parts of the following: 10 x 1 = 10

a) Draw and explain the 4-bit SISO, SIPO, PISO and PIPO shift register with its waveforms.

b) Design a 3-bit synchronous counter using D-flip flop.

7. Attempt any one parts of the following: 10 x 1 = 10

a) Explain A/D convertor using voltage to frequency convertor. Describe any one method of A/D convertor.

b) What are the voltage regulators? Discuss the working of shunt and series Op-Amp based voltage regulators.