Printed Pages: 4 **NEC-409(A)**

(Following Paper ID and Roll No. to be filled in your Answer Books)	
Paper ID : 131410	**Roll No.**

B.TECH.

Theory Examination (Semester-IV) 2015-16

ANALOG & DIGITAL ELECTRONICS

Time : 3 Hours ***Max. Marks : 100***

Section-A

Q1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

(a) What are the different materials used for the manufacturing of LED?

(b) What is the drawback in S-R flip-flop? How it can be eliminated?

(c) What are the various applications of the Multiplexer?

(d) What are the differences between Combinational and Sequential logic circuits?

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(e) What is a priority encoder?

(f) What is the Brakhausen criterion for the feedback amplifiers?

(g) What is the effect of negative feedback on characteristics of an amplifier?

(h) Mention few properties of series-shunt and shunt series feedback amplifiers.

(i) What is the principle of sinusoidal oscillator?

Section-B

Q2. Attempt any five questions from this section. **(10×5=50)**

(a) What is a photodiode? Draw typical I-V characteristic curves at two illumination levels and explain how does it work as a photoresistor?

(b) Draw the logic diagram of a two-to-four line decoder using NOR gates only.

(c) An RC coupled amplifier has a voltage gain of 1000, f_1=50Hz and f_2=200 KHz and a distortion of 5% without feedback. Find the amplifier voltage gain, f_1, f_2 and distortion when negative feedback is applied with feedback ratio of 0.01.

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(d) Design a combinational circuit whose input is a four-bit number and whose output is the 2's compliment of the input number.

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

(f) A Colpitt's oscillator is designed with C_1=100 Pf and C_2=7500 Pf. The inductance is variable. Determine the range of inductance values, if the frequency of oscillation is to vary between 750 kHz and 2050 kHz.

(g) Find the characteristic equations of all flip-flops with the help of K-map.

(h) Explain the working of the universal shift register.

Section-C

Note: Attempt any two questions from this section.

(15×2=30)

Q3. Discuss the current-voltage and capacitance-voltage characteristics and applications of the following:

a) Varactor diode

b) Tunnel diode

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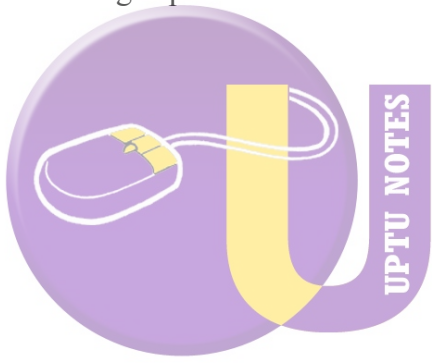
Q4. Draw the low frequency small signal model of a transistor in CB and CE configurations and explain significance of each model.

Q5. (a) What is the problem associated with the JK flip flop? How it can be overcome? Explain with necessary diagrams.

(b) An 8-bit successive approximation ADC has a resolution of 20mV. What will be its digital output for an analog input of 2.17V?



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