Printed Pages: 3 | 595 | EEC-309

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 131325 | Roll No. | | | | | | | | | |

B.Tech

(SEM. III) THEORY EXAMINATION, 2015-16

ANALOG & DIGITAL ELECTRONICS

[Time:3 hours] [Total Marks:100]

SECTION-A

1. Attempt **all** parts. All parts carry equal marks. Write answer of each part in short. (10x2=20)

   (a) Enlist the materials used for the fabrication of LEDs.

   (b) What is varactor diode?

   (c) Define the term tunneling.

   (d) What do you mean by quantum efficiency?

   (e) Draw the small signal model of voltage amplifier and current amplifier.

   (f) List the capacitances which are responsible for the gain reduction at low frequency.

   (g) Implement half adder using 2x1 MUX.

   (h) What are shift registers.

   (i) Define Bark-Husen criteria for sustain oscillations.

   (j) What are data converters.

SECTION-B

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

2. Explain the working of reverse recovery diode with a neat V-I characteristics diagram.

3. Define the term negative feedback. Explain in detail the properties of negative feedback.

4. What is the difference between combinational and sequential circuit design?

   (a) 4-bit priority encoder.

   (b) 4-bit parallel-in-serial-out shift register.

5. Explain the working of wein bridge oscillator. Also calculate the frequency of oscillation and loop gain for the same.

6. Explain the working of op-amp based astable and monostable multivibrator.

7. What materials are popular for designing crystal oscillators. Explain the working of crystal oscillator, also calculate its resonance frequency.

8. (a) Comment on the statement "MUX is a universal circuit". Implement the Boolean function $F(A,B,C) = \pi(o,2,5)$ using 4x1 multiplexer

   (b) Explain the working of Asynchronous Decade counter.

9. Explain the following:

   (i) Non-inverting Schmitt trigger.

   (ii) Switching regulator

SECTION-C

Attempt **any two** questions from this section. $(15 \times 2 = 30)$

10. Explain the working of tunnel diode with the help of neat energy band diagram.

11. Draw the high frequency equivalent circuit or the RC coupled common emitter amplifier.

12. Design a 4-bit universal shift register. Also explain its working for all the possible cases.

—x