

Roll No.

--	--	--	--	--	--	--	--	--	--

**B.E / B.Tech ( Full Time ) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2014**

**ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH**

**THIRD semester**

**EC 9215 ELECTRONIC DEVICES AND CIRCUITS**

(Regulation 2008)

Time : 3 Hours

Answer ALL Questions

Max. Marks :100

**PART-A (10 x 2 = 20 Marks)**

1. Determine the charge carrier transit time for a silicon diode which has a capacitance of 11nF when the forward current is  $I_F=50\text{mA}$ .
2. Compare the output optical power Vs input drive current (P-I) characteristics of LED and LASER diode.
3. Why N-channel MOSFETs are preferred over P- channel MOSFETs.
4. Compare the VMOS and DMOS.
5. What are the features of CC amplifiers.
6. Draw the circuit diagram of a source follower.
7. Write a short note on BiMOS cascode amplifier.
8. What are the advantages of using FET input stages.
9. If the open loop gain of an amplifier is 100 and feedback factor is 0.05, calculate the closed loop gain of the feedback amplifier.
10. State Barkhausen conditions for sinusoidal oscillators.

**Part – B ( 5 x 16 = 80 marks)**

11. Derive and explain the expression for ideal voltage-current characteristics of the PN junction diode.
12. a) Draw and explain the principle of operation and characteristic curve of Common Base (CB) Configuration. Indicate the impact of  $V_{CB}$  on cut-in voltage at input characteristics and also indicate the various regions of operation at the output characteristics of Common Base Configuration.

**(OR)**

- b) Explain with neat diagram the construction and principle of operation of n-channel JFET. Also explain the output and transconductance characteristics.

13. a) Draw any two bias arrangements for BJTs. With circuit diagram and small signal equivalent circuit, obtain the expressions for the midband voltage gain, input impedance and output impedance of a common emitter amplifier.

(OR)

- b) With circuit diagram and small signal equivalent circuit, explain the common source amplifier using MOSFET.
14. a) Draw the circuit diagram of a differential amplifier. Using the small signal equivalent circuits of difference mode and common mode, obtain the expression for CMRR.

(OR)

- b) With circuit diagram and the frequency response characteristics, explain a single tuned amplifier. What are the applications of tuned amplifiers. Explain briefly any one method of neutralization.
15. a) (i) Draw the topologies of the four types <sup>of</sup> feedback amplifiers. Compare them on the basis of the input and output impedance characteristics and the type of stabilized forward transfer gain. (12)
- (ii) Compare the frequency response characteristics of an amplifier with and without negative feedback. (4)

(OR)

- b) (i) Explain with the circuit diagram and expression for the output frequency, a Wienbridge oscillator. (10)
- (ii) Draw the electrical equivalent circuit and the impedance characteristics of a Quartz crystal. What are the advantages of crystal oscillators. (6)

\*\*\*\*\*