Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 25072

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third Semester

Electronics and Communication Engineering

EC 8351 — ELECTRONIC CIRCUITS – I

(Common to Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How thermal runaway occurs in a transistor?

2. When does a transistor act as a switch?

3. What is the slope of AC load line?

4. Find CMRR of differential amplifier in dB with differential gain 300 and common mode gain of 0.2.

5. Give the relation between pinch off voltage and drain resistance.

6. How a MOSFET can be used to amplify a time varying voltage?

7. What is the reason for the drop in gain at the low frequency region and at the high frequency region?

8. Define rise time. Give the relationship between bandwidth and rise time.

9. Compare the SMPS with linear power supply.

10. Why capacitor input filter is not suitable for variable loads?

PART B — (5 × 13 = 65 marks)

11. (a) With neat diagrams, explain any two bias compensation techniques and state its advantages and disadvantages.

Or

(b) Explain voltage divider bias method for BJT and derive an expression for stability factors.

12. (a) Examine the circuit diagram for a differential amplifier using BJT's. Describe common mode and differential modes of working.

Or

(b) Analyze the changes in the AC characteristics of a common emitter amplifier when an emitter resistor and an emitter bypass capacitor are incorporated in the design. Explain with necessary equations.

13. (a) Derive voltage gain, input and output impedance of common source JFET amplifier with neat circuit diagram and equivalent circuit.

Or

(b) (i) Bring out the small signal parameters of MOSFET. (7)

(ii) Construct the small signal equivalent circuit for common source NMOS and explain. (6)

14. (a) Derive the expressions for the short circuit current gain of common emitter amplifier at high frequency.

Or

(b) Develop the high frequency equivalent circuit of a MOSFET from its geometry and derive the expression for short circuit current gain in the common source configuration.

15. (a) Discuss the working of centre tapped full wave rectifier with neat diagram. Also derive the expression for the rectification efficiency, ripple factor, transformer utilization factor and peak factor of full wave rectifier.

Or

(b) Elucidate the process and procedure of troubleshooting and fault analysis in electronic circuits.

PART C — (1 × 15 = 15 marks)

16. (a) Draw and explain the characteristics of BiCMOS cascode amplifier and derive the expression for voltage gain.. Also discuss graphically the amplification process of a BiCMOS amplifier circuit.

Or

(b) Explain the operation of cascade amplifier and derive voltage gain, overall input resistance, overall current gain and output impedance.

———————