Reg. No.   Name:

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2016

Course Code: EC100

Course Name: BASICS OF ELECTRONICS ENGINEERING

Max. Marks: 100   Duration: 3 Hours

PART A

Answer ALL questions. Each question carries 2 marks

1. Differentiate relays and contactors and write the applications of each.

2. What is tolerance of a resistor? Find the resistance range for the carbon resistor having the colour bands: yellow, violet, red and gold.

3. Write any four applications of electronics in the field of defence.

4. Draw the energy band diagrams of insulator, semiconductor and conductor.

5. How does an Avalanche breakdown differ from Zener break down?

6. Write the type number of the following: a) Low frequency low power transistor, b) High frequency low power transistor, c) Power Transistor, d) Rectifier Diode.

7. What is the working principle of SMPS?

8. Describe the role of different capacitors in RC coupled amplifier?

9. Define bandwidth of an amplifier and mark the important parameters in the frequency response graph.

10. Draw the internal block diagram of op-amp and write the functions of each block?

11. Realize the logic functions: Sum $S = A+B$ and Carry $C_Y = AB$ using gates and prepare the truth table.

12. What are the advantages of integrated circuits?

13. What is frequency modulation? Write the frequency bands used for AM and FM broadcast.

14. Write the RADAR range equation and list the factors affecting the range.

15. Distinguish between LEO, MEO and GEO satellites.

16. Discuss the basic principle of GPS.

17. Compare the features of GSM and CDMA.

18. Explain the total internal reflection in optical fiber with the help of a diagram.

19. What is the need for cell splitting in cellular communication system?

20. What are the characteristics of Plasma Display?

PART B

Answer any 8 complete questions each having 5 marks

21. Discuss the construction, working and application of electrolytic capacitor.

22. What is the basic working principle of transformer? List at least four different types of transformers and its applications.

23. Draw the VI characteristics of Zener diode and explain the principle of working.

24. Draw a sketch to show all the current components of an NPN transistor and derive the relation between currents.

25. Compare CB, CE and CC configurations of a transistor. Enumerate the applications of each configuration.

26. What is a full wave rectifier? Derive the expression for rectifier efficiency and ripple factor.

27. Draw the circuit diagram of a single stage RC coupled amplifier and explain the significance of each component.

28. Draw the circuit and explain the working of an inverting amplifier with op-amp and derive the expression for its closed loop gain.

29. Differentiate between analog and digital integrated circuits. Write at least four application specific integrated circuits from each group.

30. Draw the block diagram of a digital storage oscilloscope and specify the functions of each block.

Answer any 4 complete questions each having 5 marks

31. Define amplitude modulation. Draw the AM signal and its spectrum. Derive an expression for modulation index and total power in an AM signal.

32. What are the different types of RADARs and explain any one type with a block diagram.

33. What is satellite transponder? Explain its working with a block diagram.

34. Describe with the help of diagrams, how a call is established between two mobile phone subscribers.

35. Sketch the elements associated with an optical fiber communication system and describe the different types of optical fiber cables available for establishing the link.

36. Sketch the elements associated with a cable TV system and explain the functions of each.