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Reg. No. : ..... Name : .....

SECOND SEMESTER B.TECH. DEGREE EXAMINATION, MAY/JUNE 2016

EC100 : BASICS OF ELECTRONICS ENGINEERING

Max. Marks : 100 Duration : 3 Hours

PART – A

Answer **all** Questions. **Each** carrying **two** marks **each.**

1. Write any four applications of electronics in the field of medical science.
2. A carbon resistor has the colour bands: green, blue, red and gold. What is its resistance value ? Also, write the colour band sequence for $390 \pm 20\% \Omega$.
3. What is the difference between active and passive components ? Name at least two in each category.
4. A Germanium diode carries a current of 1mA at room temperature when a forward bias of 0.15V is applied. Estimate the reverse saturation current at room temperature.
5. Derive the relationship between α and β of a transistor.
6. Draw the symbol and write the general specifications of the following :
   a) Zener diode
   b) NPN transistor.
7. What is the need for feedback in oscillators ? Explain the criteria for sustained oscillation.
8. Define ripple factor and write the values for half wave, center tapped and bridge rectifiers.
9. Draw the block diagram of a public address system.
10. Define the terms CMRR and slew rate. Give its value for an ideal op-amp.

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11. Which are the universal gates ? Why are they called so ? Realize an AND gate using any one universal gate.

12. Draw the block diagram of a function generator and mark the output wave form of each block.

13. Why modulation is required in communication ?

14. Define percentage of modulation in AM and describe how the modulation index of AM wave evaluated from the waveform ?

15. Write radar range equation and specify the parameters used in the equation.

16. Why uplink frequency is different from downlink frequency in satellite communication ?

17. What is meant by frequency reuse in cellular communication ?

18. What are the major light sources used in optical fiber communication ?

19. Why FM preferred to AM for sound signal transmission in TV system ?

20. Describe the major features of HDTV system.

PART – B

Answer **any 8** Questions. **Each** carrying **five** marks **each.**

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

22. Draw and explain the construction of electrolytic capacitor. Write its general specifications and applications.

23. Plot the forward and reverse characteristics of a PN diode and discuss it.

24. Compare the three transistor configurations and write the applications of each.

25. Discuss the working principle of solar cell and photo diode and differentiate them.

26. With neat circuit diagram and waveforms explain the working of a bridge rectifier with capacitor filter.

27. Discuss the need for biasing in amplifiers. Explain the functions of each component in RC coupled amplifier with relevant waveforms.

28. What is comparator ? Explain the working of an op-amp based comparator with circuit diagram and waveforms.

29. Explain the principle and working of a digital multimeter with block diagram and list the advantages over analog multimeter.

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

PART – C

Answer **any 4** Questions. **Each** carrying **five** marks **each.**

31. Draw the block diagram of AM super heterodyne receiver and explain the functions of each block.

32. Draw and explain the block diagram of pulsed radar.

33. What are the satellite system link models ? Explain with neat diagram.

34. What are the major network switching subsystems in GSM and explain the functions of each.

35. With the help of block diagram, explain the working of an optical fiber communication system. What are the advantages ?

36. Explain the operation of CCTV with block diagram and mention its applications.
