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#### APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

## FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, JULY 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. For the samples given below, specify the nominal value, tolerance, maximum and minimum value.
  - a. A resistor coloured -yellow, violet, orange and gold
  - b. A capacitor with code- 104K
- 2. Differentiate active and passive components. Name at least two in each category.
- 3. Write any four applications of electronics in the field of automobile.
- 4. How a potential barrier is created in an open circuited PN junction diode?
- 5. Why Silicon diode is more popular than Germanium? Mention its applications and cut-in voltage.
- 6. Draw the symbol and write the general specifications of the following
  - a) Photo diode
- b) PNP transistor
- 7. Define peak inverse voltage and write the values for Half wave, Centre tapped and Bridge rectifiers.
- 8. Draw the block diagram of a regulated power supply.
- 9. Compare positive and negative feedback.
- 10. What are the ideal characteristics of an op-amp?
- 11. What are the applications of CRO?
- 12. State and prove De-Morgan's theorem with truth table.
- 13. Modulation reduces the height of the antenna. Justify.
- 14. Define modulation index in AM and compute the percentage of modulation, when the maximum amplitude is 10V and minimum is 6V.
- 15. What is uplink and downlink in satellite communication? Which frequency is kept higher and why?
- 16. Write at least four important applications of RADARs.
- 17. What is hand-off in mobile communication and mention the types?

- 18. What are the major light detectors used in optical fiber communication system.
- 19. Why scanning and synchronizing is required in TV systems.
- 20. What is the need for cell splitting in cellular system?

#### PART B

#### Answer any 8 complete questions each having 5 marks

- 21. Discuss the construction, working and application of an electro-mechanical relay.
- 22. On what basis the capacitors are classified? List the different types of capacitors and discuss the operation of a variable capacitor?
- 23. Analyze the common emitter configuration of the transistor and derive the relation between  $\alpha$  and  $\beta$ .
- 24. Draw and explain the experimental setup for obtaining the forward and reverse characteristics of a diode and plot the approximate graphs for silicon and germanium diodes.
- 25. Differentiate intrinsic and extrinsic semiconductors and discuss the formation of PN junction.
- 26. With neat circuit diagram and waveforms explain the working of a centre tapped full wave rectifier with capacitor filter.
- 27. Draw and explain the block diagram of a public address system.
- 28. What are oscillators? List the types and principle involved. Explain the working of any one oscillator with circuit diagram.
- 29. Draw the circuit and explain the working of a non-inverting amplifier with op-amp and obtain the expression for its closed loop gain.
- 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. Draw the block diagram of AM receiver and explain the functions of each block with waveforms.
- 32. What is GPS? Explain how GPS tracks the position?
- 33. Explain with a block schematic of the transponder used in satellite and list the band of frequencies used for different applications.
- 34. How does a GSM network connect people around? Describe the sequence of operations and components involved.
- 35. Explain optical communication with the help of block diagram and list the merits and demerits.
- 36. Describe a typical HDTV system with block diagram.