

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SECOND SEMESTER B.TECH DEGREE EXAMINATION, JUNE 2017

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. Write any four applications of electronics.
2. Explain working principle of transformer. Name any two classification of transformer.
3. A carbon resistor has colour code violet, green and brown. Find the range of resistance value.
4. What is extrinsic semiconductor? Give four examples for pentavalent impurity and trivalent impurity.
5. Calculate the value of emitter current of a transistor in active region for which  $\beta = 40$  and  $I_B = 25\mu A$ .
6. Draw the symbol of npn transistor. What are the typical doping concentrations and sizes of three regions of transistor?
7. Draw the block diagram of dc power supply and specify the functions of each block.
8. State Barkhausen's criterion for sustained oscillations.
9. Derive the expression for ripple factor of a half wave rectifier. What is its value?
10. Name any four parameters of operational amplifier. Give the values of these parameters for an ideal Op-Amp.
11. Draw the block diagram of Op-Amp and specify the function of each block.
12. Draw the symbol and truth table of XOR gate and XNOR gate.
13. Name and specify any four frequency bands used for satellite communication.
14. What are the needs for modulation?
15. The amplitude of carrier wave is 10V and frequency is 1KHz. Modulation index is 0.4. Calculate the total power transmitted of an AM wave.
16. Differentiate the concepts between uplink and downlink frequencies.
17. Write any four advantages of optical communication system over copper wire-based communication system.
18. What is frequency reuse?

19. Define total internal reflection. What is the approximate value of core and cladding diameter of OFC?
20. Name any four applications of CCTV.

### PART B

*Answer ANY 8 Questions. Each question carries 5 Marks.*

21. With the help of necessary diagram, explain carbon composition resistor and carbon film resistor.
22. Explain the basic principles of contactors and relays with the help of neat schematics.
23. With the help of diagrams, explain the principle of operation of npn transistor. What is the current gain of common emitter transistor? What is the relationship between  $\alpha$  and  $\beta$ ?
24. Explain the constructional details of LED and Solar Cell. Explain the working of each.
25. Briefly explain the working of Zener voltage regulator. Discuss the line regulation of a Zener voltage regulator.
26. Draw the circuit and explain the working of RC coupled common emitter amplifier. Plot its frequency response showing the cut off frequencies.
27. Explain the structure and operation of n type and p type semiconductor.
28. Define CMRR and slew rate of Op-Amp. Derive the expression for the gain of inverting and non-inverting amplifier using Op-Amp.
29. Draw the block diagram and explain the working of a function generator.
30. Construct XOR gate and XNOR gate using any one type of the universal gates only.

### PART C

*Answer ANY 4 Questions. Each question carries 5 Marks.*

31. What is communication satellite and explain the operation of satellite communication system? Write any two application of satellite communication system.
32. What is modulation? Differentiate between amplitude modulation and frequency modulation. Define frequency deviation of FM.
33. Draw the block diagram of FM super heterodyne receiver and explain the working.
34. Explain the operation of cellular mobile communication system. Explain the steps involved in a typical call connection between two mobile users.
35. Draw the block diagram of optical communication system and explain. Write any two applications of optical communication system.
36. Draw the block diagram and explain the working of a cable TV system.

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