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# INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous) 

## B.Tech III Semester End Examinations (Regular), February - 2021

Regulation: IARE-R18
BASIC ELECTRONICS ENGINEERING
Time: 3 Hours (CE)

Max Marks: 70
Answer any Four Questions from Part A
Answer any Five Questions from Part B

## PART - A

1. Describe the concept of load line analysis involved in pn junction diode.
2. Outline the symbols of NPN and PNP transistor.
3. Explain about the operation principle of comparator.
4. Explain in brief the principle of operation of successive approximation ADC.
5. Convert the following binary numbers to decimal numbers i) $101_{2}$ ii) $1011_{2}$
6. Find the value of $\beta$ if i) $\alpha=0.9$ ii) $\alpha=0.98$ iii) $\alpha=0.99$.
7. Show the relation between $I_{C}, \beta, I_{B}$ and $I_{C B O}$ in bipolar junction transistor.
8. Discuss in detail about the synchronous counter circuit.

## PART - B

9. Explain in detail about the semiconductor diode using both ideal versus practical cases.
10. An AC voltage of peak value 20 V is connected in series with a silicon diode and load resistance of $500 \Omega$. If the forward resistance of diode is $10 \Omega$, Find:
i) Peak current through diode
ii) Peak output voltage. What will be these values if the diode is assumed to be ideal?
11. Explain the construction and operation of common collector configuration.
12. In a common base connection, $\alpha=0.95$. The voltage drop across $2 \mathrm{k} \Omega$ resistance which is connected in the collector is 2V. Find the base current.
13. Describe the construction and operation of voltage follower circuit.
14. Explain in detail about the differentiator and integrator circuit.
15. Discuss the operation of parallel comparator type ADC with circuit diagram.
16. Design an astable multivibrator using 555 timer to produce 1 Khz square wave form for duty cycle $=0.50$ [10M]
17. Explain the JK and master slave flip-flop. Give its timing waveform.
18. Find the boolean algebra expression for the following circuit shown in Figure 1.


Figure 1

