

## **QUESTION BANK**

**Course: Analog Electronics**

**Course Code: BTEE-302-18**

**Semester: 3<sup>rd</sup>**

### **2 Marks**

1. What is biasing and need for biasing?
2. Comparison of n-channel MOSFET and p-channel MOSFET.
3. Comparison of MOSFET and BJT.
4. Why voltage divider bias is commonly used in amplifier circuit?
5. Comparison of the three BJT configurations (CE, CC and CB).
6. What are the types of biasing?
7. Define the stability factor.
8. Draw the small signal equivalent of p-MOSFET.
9. Why N channel FET's are preferred over P channel FET's?
10. Write the formula for gain calculation?
11. Define differential amplifier.
12. What is CMRR and its formula?
13. Define positive and negative feedback?
14. What are the advantages of negative feedback?
15. What is meant by phase and gain margin?
16. Define open loop and closed loop gain.
17. What is Barkhausen criterion?
18. What is the difference between amplifier and oscillator?
19. Explain any of the RC phase shift oscillator in detail.
20. Explain any of the LC oscillator in detail.

21. Draw the VI Characteristics of the PN Diode.
22. What is depletion region in PN junction?
23. What is forward bias and reverse bias in a PN junction?
24. Define the term diffusion current.
25. What is break down? What are its types?
26. Why BJT is called current controlled device?
27. Draw the characteristics of CE configuration.
28. Define current amplification factor in BJT.
29. Discuss the major difference between a bipolar & unipolar device?
30. Give some applications of BJT.
31. Draw the V-I characteristics curve of MOSFET.
32. Define Common Mode Rejection Ratio.
33. Define Operational amplifier?
34. Draw the internal circuit of OPAMP.
35. What are the ideal characteristics of OP-AMP?

**5 Marks/ 10 Marks**

1. Explain any two methods of biasing BJT and derive its stability factor.
2. Explain the small signal analysis of BJT CB amplifier and derive the expression.
3. Derive gain, input and output impedance of common drain MOSFET amplifier with neat circuit diagram and equivalent circuit.
4. (i). Derive the voltage gain of CE amplifier.  
(ii). Describe the CC amplifier.
5. Derive the expression for CMRR of emitter coupled differential amplifier.
6. Explain the characteristics of negative feedback amplifier.

7. With neat sketch compose the construction, operation and its characteristics of PN junction diode. Also list its advantages, disadvantages and its applications.
8. Explain the operation of NPN and PNP transistors.
9. (i) Explain the input and output characteristics of a transistor in CB configuration.  
(ii) Give the comparison of CE, CB, and CC configuration.
10. Draw the circuit diagram of a NPN transistor CE configuration and the input and output characteristics. Also define its operating regions.
11. (i) Explain the input and output characteristics of a transistor in CC configuration.  
(ii) Give the relationship between  $\alpha$ ,  $\beta$  and  $\gamma$  of a transistor.
12. With neat diagram explain the working of Enhancement MOSFET & Depletion MOSFET with its necessary characteristics curve.
13. (i) Give some characteristics of MOSFET.  
(ii) Explain the operation of dual gate MOSFET.
14. Depletion region decreases during Forward bias and increases during Reverse bias in the case of a p-n junction diode.-justify
15. Develop the equation for differential mode gain and common mode gain of a differential amplifier using BJT. Derive the expression for differential mode gain and common mode gain.
16. Illustrate the circuit of emitter coupled BJT differential amplifier, and derive expressions for differential gain, common mode gain and CMRR.
17. Derive the expression for current gain, input impedance and voltage gain of a CE Transistor Amplifier.
18. Draw and Explain the internal block diagram of an op-amp circuit.
19. List the six characteristics of an ideal op-amp and explain in detail and give the practical op-amp equivalent circuit.
20. (i) Examine the functions of all the basic building blocks of an Op-Amp.  
(ii) Explain the application of op-amp as adder and Subtractor.