C **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: U4408

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Fourth Semester

Electronics and Communication Engineering

21UEC408-PRINCIPLES OF LINEAR INTEGRATED CIRCUITS

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. What is the use of notch and dot in DIP ICs? CO1-U

   (a) Determine the pin configuration (b) Designed to represent device type

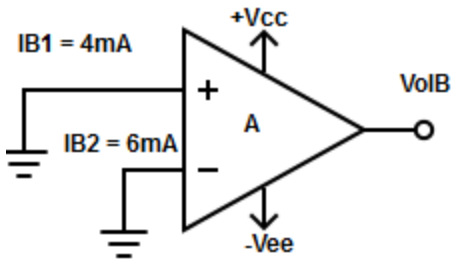
   (c) Represent property of IC (d) Find the pin number

2. What makes the output voltage equals to zero in practical op-amp? CO1-U

   (a) Input offset voltage (b) Output offset voltage

   (c) Offset minimizing voltage (d) Error voltage

3. Find the input bias current for the circuit given below CO3- App



   (a) 10mA (b) 5mA (c) 2mA (d) 6mA

4. At which state the phase-locked loop tracks any change in input frequency? CO1- U

   (a) Free running state (b) Capture state

   (c) Phase locked state (d) All of the above

5. How many control lines are present in analog to digital converter in addition to reference voltage? CO1- U

(a) Three (b) Two (c) One (d) None of the above

PART – B (5 x 3= 15 Marks)

6. Define an Integrated circuit. CO1- U

7. The output of an operational amplifier is 5V peak sine wave whose slew rate is 0.5V/μs. Find the maximum allowable frequency of the signal. CO2-App

8. Draw the output waveform of a clipper circuit with input signal amplitude of 5V and reference voltage of +2V. CO3-App

9. In a Monostable Multivibrator using 555 timer, R=100kΩ and the time delay is 100ms.Solve for the value of C. CO5-App

10. If the analog signal V_a is +4.129V .Find the equivalent digital number using dual slope ADC. CO6-App

PART – C (5 x 16= 80 Marks)

11. (a) Discuss in detail about the basic planar process in fabrication of ICs. CO1-U (16)

Or

(b) Explain in detail about silicon wafer preparation and photolithography. CO1-U (16)

12. (a) (i) Explain the circuit which produce the output with 180^0 phase shift of the input signal and also produce the output with 0^0 phase shift of the input signal. CO1-U (16)

(ii) Illustrate the function of the current source which provides constant current in the load.

Or

(b) Explain the DC characteristics of an operational amplifier. CO1-U (16)

13. (a) Design the circuit which is used to produce the integration and differentiation of the input square input signal. CO3- App (16)

Or

(b) Design a Schmitt trigger that produces square wave from input sine wave. CO3- App (16)

14. (a) Design an Astable Multivibrator using IC 555 with its frequency of oscillation is 1 KHz. CO4- App (16)

Or

(b) Determine the change in DC control voltage V_c during lock, if input signal frequency f_s = 10 KHz, the free running frequency is 10.66 KHz and the V/F transfer coefficient of VCO is 6600 Hz/V and analyze the same with f_s = 20 KHz input signal. CO4- App (16)

15. (a) Design a 3 bit weighted resistor DAC with neat diagram. CO6- App (16)

Or

(b) Design an 8 bit the successive approximation ADC with neat diagram. CO6- App (16)