

Question Paper Code: 94B02

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Fourth Semester

Biomedical Engineering

19UBM402 - ANALOG AND DIGITAL INTEGRATED CIRCUITS

(Regulation 2019)

Duration : 1.45 hours

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any TEN of the following questions)

1. An operational amplifier has a slew rate of 25V/ms. How long will it take for the output to change from 0 to 15 V? CO2 - Ap
2. Explain the concept of virtual grounding. CO1 - U
3. What are the uses of instrumentation amplifier? CO1 - U
4. Design a first order low-pass filter at a cut-off frequency of 2 kHz with a passband gain of 2. CO2 - Ap
5. What is V_{UT} and V_{LT} of Schmitt Trigger? CO1 - U
6. Compare and Contrast the types of ADC w.r.to Speed, Cost and Size. CO3 - An
7. List the applications of IC555 in astable mode of operation. CO1 - U
8. Design the value of R required in a Monostable Multivibrator with $T_{on} = 1.1 RC$ using IC 555 Timer, when $C = 0.1 \mu F$. CO2 - Ap
9. What are the merits of switching regulator? CO1 - U
10. Implement the following function with NAND gate. $Y = ABC + \bar{A}\bar{B}\bar{C} + B$ CO2 - Ap
11. Differentiate combinational and sequential circuit. CO3 - An
12. Draw a full adder using two half adders. CO1 - U
13. Differentiate latches and flip flops with an example. CO3 - An
14. What is race around condition? How it is avoided? CO1 - U
15. Write the truth table of toggle flipflop. CO1 - U

PART – B (3 X 10 = 30 Marks)

(Answer any THREE of the following questions)

16. Derive the closed loop gain of non-inverting amplifier in both ideal and practical case. CO1 - U
 17. Design a 4 bit R-2R ladder DAC and compute the analog equivalent of the binary input 1011. CO2 - Ap
 18. Differentiate and interpret between the two operating modes of 555 timer. CO3 - An
 19. Simplify the following function using Quine McCluskey method $F(A,B,C,D) = \Sigma(1,3,4,5,6,7,9,12,13)$. Also obtain the NAND implementation of the simplified expression. CO2 - Ap
 20. Design a mod-10 Synchronous binary counter using JK flip-flops. CO2 - Ap
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