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Question Paper Code : 80134

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Electrical and Electronics Engineering

EE 8451 — LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulation 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the term Encapsulation.

2. List the advantages of thin film resistors.

3. Give the various types of frequency compensation.

4. The output voltage of a certain op-amp circuit changes by 20 V in 4 μs. What is its slew rate?

5. List the four requirements of an Instrumentation amplifier.

6. Give the circuit using Op-amp for a first order low-pass filter with variable gain.

7. Determine the frequency of oscillations, if the duty cycle D = 20% and the ON period $T_{on} = 2$ ms.

8. Draw the output of a missing pulse detector.

9. What is a Load cell?

10. Give the seven output voltage options available in fixed voltage series regulator.

PART B — (5 × 13 = 65 marks)

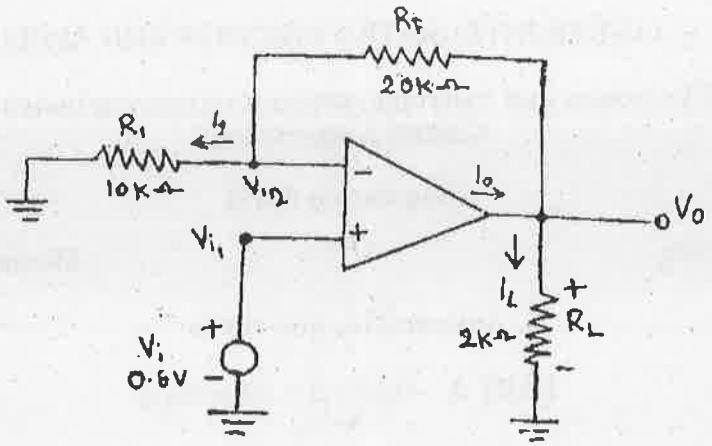
11. (a) (i) Explain the fabrication technique of FET in detail. (7)

(ii) Discuss the Photolithographic process with necessary illustrations. (6)

Or

(b) Describe the methods in Thin and Thick film technology.

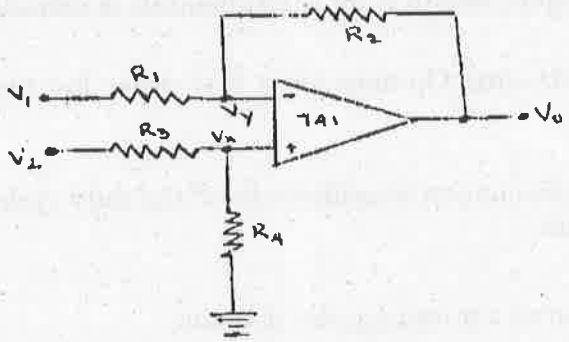
12. (a) For the given non-inverting amplifier shown in figure below, determine (i) A_v; (ii) V_0; (iii) I_L and (iv) I_0.



Or

(b) Explain with neat circuit expressions about the working of (i) Inverting Amplifiers (ii) Integrating circuit and derive the gain. (6 + 7)

13. (a) Find the following for the given Op-amp differential amplifier : (i) The gain of the amplifier (ii) The input resistance (iii) Output voltage, when the inputs are $1\sin(2000t)$ V and $1.2\sin(2000t)$ and the $R_1 = R_3 = 1.2$ kΩ and $R_2 = R_4 = 22$ kΩ.



Or

(b) Discuss the application of Op-amps, with necessary equivalent circuits and expressions for (i) D/A converter (ii) A/D converter.

14. (a) In detail, explain the functional block and characteristics of 555 Timer with its PWM application.

Or

(b) Discuss the ICC 566 as a voltage controlled oscillator with necessary illustrations.

15. (a) Explain the Fixed voltage regulator and its applications.

Or

(b) Explain the function of SMPS with neat waveforms and schema.

PART C — (1 × 15 = 15 marks)

16. (a) With neat figures explain the design of a circuit for performing (i) square wave generation (ii) sweep signal conversion (iii) clamped signal output. (15)

Or

(b) Determine the output frequency f_0, lock range Δf_L and capture range Δf_C of IC 565. Assume $R_1 = 15\,k\Omega$, $C_1 = 0.01\,\mu F$, $C = 1\,\mu F$ and the supply voltage is +12 V. (15)