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Question Paper Code:R3305

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Third Semester

Electrical and Electronics Engineering

R21UEE305- LINEAR IC APPLICATIONS

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

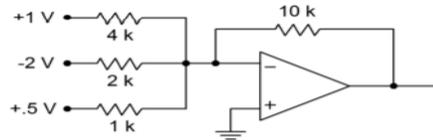
PART A - (10 x 2 = 20 Marks)

1. Explain the reasons for using aluminum in the metallization process of IC fabrication. CO1- U
2. Identify IC's on the basis of chip size and circuit complexity CO1- U
3. Illustrate and interpret the 8-pin layout of IC 741 with proper labeling. CO1- U
4. Design an amplifier with gain of +5 and input resistance $10k\Omega$ using one op-amp. CO3-App
5. List the features of instrumentation amplifier. CO1- U
6. What are the applications of comparator? CO1- U
7. Explain the pin diagram of IC555. CO1- U
8. Explain why the lock-in range is important for proper operation of a PLL. CO1- U
9. What is a voltage regulator CO1- U
10. Classify the different types of voltage regulators CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Illustrate the Epitaxial Growth Process and Diffusion Process in Integrated Circuit Fabrication using a clear diagram. CO1 - U (16)
- Or
- (b) Explain Silicon wafer preparation and Oxidation Process in Integrated Circuit Fabrication using a clear diagram. CO1 -U (16)

12. (a) Calculate the output of the summing amplifier in figure below, CO3- App (16)
with the given DC input voltages.



Or

- (b) Design the Operational Amplifier Circuit in which the gain is negative. Values of Input Resistor are 10K ohm. Feedback Resistor is 100K ohm, Input Voltage is 1V, A load of 25K ohm is connected to the output terminal. Calculate i) Input Current ii) Output Voltage iii) Load Current and iv) Total Current i_0 . CO3- App (16)
13. (a) Design an amplifier circuit which has high CMRR, very low DC offset and high open loop gain. CO3- App (16)
Or
(b) Design a circuit to generate square wave simultaneously with the frequency of 1KHz. CO3- App (16)
14. (a) Design a circuit to generate one pulse with the frequency of 1KHz using 555 Timer. CO3- App (16)
Or
(b) Construct the circuit which has two quasi-stable states using IC555 and derive the frequency of output signal. CO3- App (16)
15. (a) Analyze how the charging and discharging of the capacitor inside IC 8038 leads to the generation of triangular and square waveforms. CO5- Ana (16)
Or
(b) Analyze how the internal reference voltage of LM723 influences the stability and accuracy of the regulated output. CO5- Ana (16)