Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Sub.Code:** | **14EC2008** | **Duration :** | **3hrs** |
| **Sub.name:** | **LINEAR INTEGRATED CIRCUITS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Show with the help of circuit diagram an op-amp that can be used as,  i) Inverting Amplifier ii) Non-Inverting Amplifier. | CO1 | 10 |
| b. | Design an Op-amp differentiator that will differentiate an input signal with fmax= 500Hz. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Design an op-amp circuit to obtain the difference between two voltages V1, V2. | CO1 | 5 |
| b. | With necessary circuit diagrams prove that the operational amplifier can be used as a Integrator. State the problems associated with the basic integrator and design a practical integrator to overcome the drawbacks. | CO1 | 15 |
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| 3. | a. | Derive the expression for frequency of an astable multivibrator using IC 741. | CO1 | 15 |
| b. | A Schmitt trigger circuit with R2=100Ω, R1=50KΩ, Vref=0V, Vi=1 Vpp(peak to peak) sine wave and saturation voltages are +14V &-14V. Determine threshold voltages VUT and VLT. | CO1 | 5 |
| (OR) | | | | |
| 4. |  | State the Barkhausen criterion.With suitable circuits predict the expression for the frequency of Phase shift oscillator. | CO1 | 20 |
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| 5. | a. | Design a Wide-band pass filter having fl=600Hz,fh=2KHz and pass band gain of 4.Find the value of Q of the filter. | CO1 | 5 |
| b. | Explain the working of Monostable multivibrator using IC 555 timer and derive the expression for frequency of oscillations. | CO2 | 15 |
| (OR) | | | | |
| 6. | a. | Compile an expression for the transfer function of a first order low pass filter. Also derive the expression for frequency response. | CO1 | 10 |
| b. | Draw and explain the functional block diagram of IC 555 timer. | CO2 | 10 |
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| 7. | a. | Give the functional description of a 555 timer and also explain how it works as an astable multivibrator. Derive the value of T | CO2 | 12 |
| b. | Explain the functional modules of a Phase locked loops with the necessary diagrams. | CO3 | 8 |
| (OR) | | | | |
| 8. |  | With a neat circuit diagram explain the methods used in weighted resistor, R-2R digital to analog converter. | CO3 | 20 |
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|  | | **Compulsory**: |  |  |
| 9. |  | With neat diagrams explain the basic planar process involved in chip fabrication. | CO3 | 20 |