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



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **15EI2005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOSIGNAL CONDITIONING 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. | Design an opmap circuit whose output voltage is given by  V0=V1-V2+V3-V4 | CO1 | 14 |
| b. | For the op – amp configuration shown in figure, determine the Rf if the gain required is 100. | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | An op amp has bias currents IB1 and IB2 as 400nA and 300nA. Calculate the input bias current of the op amp. | CO1 | 5 |
| b. | Explain the types of bio signals mostly used for signal conditioning applications. | CO3 | 5 |
| c. | Design and construct an amplifier that gives an output voltage ten times that of input. | CO2 | 10 |
|  |  |  |  |  |
| 3. | a. | Derive the first order low pass filter using opamp. | CO2 | 8 |
|  | b. | Explain the function of op amp as diffentiator, draw the waveforms. | CO3 | 12 |
| (OR) | | | | |
| 4. |  | Design and construct a monostable multivibrator circuit for timing applications. | CO2 | 20 |
|  |  |  |  |  |
| 5. | a. | Describe in detail on PLL. | CO1 | 6 |
|  | b. | Explain in brief about voltage control oscillator with relevant schematics. | CO1 | 14 |
| (OR) | | | | |
| 6. | a. | With a neat diagram explain capacitively coupled medical isolation amplifier and its significance. | CO3 | 12 |
|  | b. | Comment on optical mode of isolation in bio measurement. | CO3 | 8 |
|  |  |  |  |  |
| 7. | a. | Describe in detail various ADCs. | CO2 | 8 |
|  | b. | Write short notes on different types of DACs. | CO2 | 12 |
| (OR) | | | | |
| 8. | a. | Design a second order HPF for a cut of frequency of 3 KHz and draw the response. | CO1 | 10 |
|  | b. | The response of a filter is equivalent to integrator. Identify the filter type and justify. | CO1 | 6 |
|  | c. | Differentiate wide bandpass and narrow bandpass filters. | CO2 | 4 |
|  | | **Compulsory:** |  |  |
| 9. |  | Discuss on various electrical interface problems and safety standards in bio potential measurements. | CO3 | 20 |

ALL THE BEST