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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 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 a an amplifier of gain 100. The ouput of the amplifier should be 1800 out of phase with the input. | CO3 | 8 |
| b. | Design an opmap circuit whose output voltage is given by V0=V1-V2+V3-V4 | CO1 | 12 |
| (OR) | | | | |
| 2. | a. | Design and construct an amplifier that gives an output voltage ten times that of input. | CO2 | 8 |
| b. | Design an op amp circuit to implement this equation V0 = V1 | CO2 | 6 |
| c. | State the reason for the offset currents at the input of the op amp | CO1 | 6 |
| 3. |  | Analyze the circuit given below. Mention the characteristics and significance of the given circuit. Calculate the output voltage for the circuit when V1 = 2.5 V and V2 = 2.25 | CO3 | 20 |
| (OR) | | | | |
| 4. | a. | List various applications of Comparators | CO1 | 4 |
|  | b. | Describe in detail any two medical isolation amplifiers | CO2 | 8 |
|  | c. | Write short notes on various frequency compensation techniques for opamp AC analysis | CO1 | 8 |
| 5. | a. | Design and construct a first order Low pass filter for a cut off frequency of 1Khz and draw the response. | CO3 | 10 |
|  | b. | With relevant diagrams illustrate BPF as a combination of LPF and HPF | CO1 | 10 |
| (OR) | | | | |
| 6. |  | An IC 555 chip has been used to construct a pulse generator. Typical pin connections with components are shown below. It is desired to generate a square pulse of 10 kHz.   Evaluate values of RA and RB if the capacitor C has the value of 0.01 µF for the configuration chosen. If necessary you can suggest modification in the external configuration. | CO3 | 20 |
| 7. | a. | Explain in brief the significance of digitizing. | CO2 | 3 |
|  | b. | What are the various digital interfaces used? | CO2 | 5 |
|  | c. | Explain ADC and its types | CO2 | 12 |
| (OR) | | | | |
| 8. | a. | Write short notes on Voltage controlled oscillator. | CO2 | 8 |
|  | b. | Briefly explain PLL and its biomedical applications. | CO3 | 12 |
|  | | **Compulsory:** |  |  |
| 9. |  | Discuss in detail about the electrical hazards and the safety measures in biomedical applications. | CO3 | 20 |

ALL THE BEST