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

G:\logo and QP Template\logo 3 Feb 2018 final.tif

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

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EC2054** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIO-MEDICAL SIGNAL PROCESSING** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Explain the basic procedure involved in computer aided diagnosis of biomedical signals with a case study. | CO1 | 20 |
| (OR) | | | | |
| 2. | a. | List the objectives of biomedical signal analysis and specify the necessity for preprocessing in biomedical signals. | CO1 | 12 |
| b. | Draw the block Diagram of EMG Recording Setup and explain briefly. | CO3 | 8 |
|  |  |  |  |  |
| 3. | a. | Develop a parameter to discriminate between a normal ECG waveforms and ectopic beats. | CO3 | 15 |
| b. | Display the relationship between depolarization time and ion permeability in a cell. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | Explain the types of evoked potential in detail. | CO3 | 14 |
| b. | Why maternal interference occurs in fetal ECG? How it can be detected? | CO2 | 6 |
|  |  |  |  |  |
| 5. | a. | Explain the application of EEG signal analysis to diagnose sleep disorder. | CO3 | 15 |
| b. | How pattern recognition is employed in EEG waves? | CO3 | 5 |
| (OR) | | | | |
| 6. |  | Illustrate the training algorithm of back propagation neural network with necessary equations. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Bayesian classifier can be used to classify the abnormal biomedical signals.Justify the statement with suitable examples. | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | Explain the method of linear prediction adopted in biomedical signal processing. | CO1 | 8 |
| b. | What is the necessity of filtering in analysis of EEG,EMG and ECG waves? Explain any one of the filter with necessary equations. | CO1 | 12 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the time frequency models of EMG in detail. | CO3 | 10 |
| b. | Summarize the concept of wavelets in analyzing the signals for abnormality detection. | CO2 | 10 |