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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **11EE225/12EE229/EE262** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **MEASUREMENTS AND INSTRUMENTATION** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Course outcome** | | | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | | | | |
| 1. | An\_\_\_\_\_\_\_\_\_\_\_ is the one which is based on electronic or electrical principals for its measurement operation. | | CO1 | | | (1) |
| 2. | The permanent magnet moving coil instrument working under \_\_\_\_\_\_\_\_\_\_\_\_ Principle. | | CO2 | | | (1) |
| 3. | There is a controlling force present in a power factor meter (Y/N). | | CO2 | | | (1) |
| 4. | The electrodynamics type wattmeters are generally referred as \_\_\_\_\_\_\_\_\_\_. | | CO2 | | | (1) |
| 5. | Gauge factor of a strain gauge is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | | | (1) |
| 6. | \_\_\_\_\_\_\_ is used in earth resistance measurement. | | CO2 | | | (1) |
| 7. | Shaft Encoder is used in measurement of \_\_\_\_\_\_\_\_\_ displacement. | | CO2 | | | (1) |
| 8. | The most commonly used material for metallic resistance thermometer is \_\_\_\_\_\_\_ | | CO2 | | | (1) |
| 9. | The radio frequency spectrum analyzer covers a frequency range of \_\_\_\_\_\_\_\_. | | CO3 | | | (1) |
| 10. | \_\_\_\_\_\_\_\_ is the study of energy distribution across the frequency spectrum of a given electrical signal. | | CO3 | | | (1) |
| **PART B(5 X 3= 15 MARKS)** | | | | | | |
| 11. | Present the structure of the fundamental elements of an instrumentation system. | | CO1 | | | (3) |
| 12. | What is the percentage error that is used in the calibration of energy meters? | | CO3 | | | (3) |
| 13. | According to your understanding what are the conditions to name a bridge as null type Wheatstone bridge. | | CO3 | | | (3) |
| 14. | List the various thermo electric laws to be discussed in thermocouples. | | CO2 | | | (3) |
| 15. | Discuss the pros and cons of a digital instrument. | | CO2 | | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | | | | |
| 16. | a. | Comment on the dynamic characteristics of an instrument with the transfer function for a liner time invariant system. | CO2 | | | (8) |
| b. | Present the possible error in an instrument and suggest the various ways to identify those errors. | CO3 | | | (7) |
| (OR) | | | | | | |
| 17. | a. | Elaborate on the different types of damping in an instrumentation system. | | CO2 | | (8) |
| b. | Discuss on the various static characteristics of an instrument that does not vary with time. | | CO1 | | (7) |
| 18. |  | Elaborate on the electro dynamometer type wattmeter with a neat sketch and derive the instantaneous torque and average deflecting torque. | | CO2 | | (15) |
| (OR) | | | | | | |
| 19. |  | Discuss on the different adjustments to be made in a single phase energy meter instrument. | | CO3 | | (15) |
| 20. | a. | Justify the reason why Kelvin bridge is called as the double bridge and derive its balance equation. | | CO3 | | (8) |
| b. | Write a small not on the unbalanced conditions in an Ac Bridge. | | CO3 | | (7) |
| (OR) | | | | | | |
| 21. | a. | With the application of Schering’s bridge explain its operation with a relevant diagram. | | CO2 | | (8) |
| b. | Derive the general expression to measure the frequency by using the wein bridge. | | CO2 | | (7) |
| 22. | a. | With the help of a neat sketch narrate the principal operation of a variable differential transformer transducer. | | CO2 | | (8) |
| b. | What are capacitive transducers? Discuss in detail on any one such type with relevant diagrams. | | CO2 | | (7) |
| (OR) | | | | | | |
| 23. | a. | State the principal property utilized for measurement of temperature using Platinum resistance thermometers with an relevant diagram. | | | CO3 | (10) |
| b. | With a graphical sketch express the characteristics of any three materials used in resistance thermometers. | | | CO3 | (5) |
| 24. |  | Classify the spectrum analyzer into two major categories on account of instrumentation limitations and capability. | | | CO2 | (15) |
| (OR) | | | | | | |
| 25. |  | Explain with a suitable diagram the operation of a dual channel oscilloscope. | | | CO2 | (15) |

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