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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 :** | **12EI252/11EI215** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **INSTRUMENTATION AND PROCESS CONTROL FOR FOOD ENGINEERS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Laplace transform of a (e-at ) is \_\_\_\_\_\_\_\_\_. | (1) |
| 2. | Define steady state design. | (1) |
| 3. | List the advantage of closed loop system. | (1) |
| 4. | What is the purpose of spring in a control valve? | (1) |
| 5. | What are the components of feedback control system? | (1) |
| 6. | Draw the block diagram rule for eliminating negative feedback loop. | (1) |
| 7. | The Pascal (Pa) unit of pressure is written as:  a)mg/mL b)N.m-2 c)MmHg d)Kg . m2 | (1) |
| 8. | In calibration of temperature sensors by fixed point method, the device is calibrated at:   1. ice point (0°C) (b) steam point (100°C) (c) sulphur point (444.6°C) (d) all of the above | (1) |
| 9. | What is the principle of ultrasonic level sensor? | (1) |
| 10. | What is the use of Buoyancy meter? | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | What is a transient response? | (3) |
| 12 | Define servo- mechanism. | (3) |
| 13 | Write the Mason’s gain formula? | (3) |
| 14 | Define seebeck effect. | (3) |
| 15 | Draw U-Type densitometer. | (3) |

**PART C(5 X 15= 75 MARKS)**

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| 16. | Describe the Fundamental process control system and draw the automatic process control system with example. | (15) |
|  | (OR) |  |
| 17. | Obtain the Laplace transform of standard input signals.  (i) step function (ii) exponential function (iii) ramp function and sine function | (15) |
| 18. | What is control system? Explain open loop and closed loop control system with example? | (15) |
|  | (OR) |  |
| 19. | With relevant diagram explain the construction and working of pneumatically operated control valve. | (15) |
| 20. | Use Mason’s gain formula for determining the overall transfer function of the system shown in Fig. | (15) |
|  | (OR) |  |
| 21. | Construct Routh array and determine the stability of the system represented by the characteristic equation, s5+s4+2s3+2s2+3s+5=0.Comment on the location of the roots of characteristic equation. | (15) |
| 22. | Explain the construction and working of RTD. | (15) |
|  | (OR) |  |
| 23. | Explain the construction and working of Inductive pressure transducer. | (15) |
| 24. | Describe the construction and operation of a float type and capacitor type level indicating system. | (15) |
|  | (OR) |  |
| 25. | Explain the working of gas chromatography in detail with a neat sketch. | (15) |

ALL THE BEST