# 14EI801

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Electronics and Instrumentation Engineering** | | |
| **Eight Semester** | **Computer Control of Process** | | |
| **Time:** Three Hours | | **Maximum:** 60 Marks | |
| *Answer ALL Questions from PART-A.* | | | (12X1 = 12 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X12=48 Marks) |
| PART – A | | | |

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| 1. | Answer all questions | | (12X1=12 Marks) | |
|  | a) | What is the basic need of computers in process control? | |  |
|  | b) | Define observability | |  |
|  | c) | Draw the block diagram of data acquisition system | |  |
|  | d) | Represent the state model of discrete time system | |  |
|  | e) | Distinguish between position and velocity PID algorithms | |  |
|  | f) | Give an example of instantaneous process? | |  |
|  | g) | What is the necessity of mathematical modelling | |  |
|  | h) | Write the modified Z transform of unit ramp function | |  |
|  | i) | Mention the names of DCS available in the market by various vendors | |  |
|  | j) | What is the function of I/O module in PLC | |  |
|  | k) | Define Artificial Intelligence | |  |
|  | l) | List the applications of Expert control system | |  |
| **PART - B** | | | | |
| 2. | a) | List the merits and demerits of computer control system | | 4M |
|  | b) | Illustrate the operation of Supervisory control and Direct digital control systems | | 8M |
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| 3. | a) | Derive the state model of computer control system | | 6M |
|  | b) | Relate the state model in discrete time domain to pulse transfer function | | 6M |
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| 4. | a) | Formulate the Mathematical model of first order processes without and with pure delay in discrete time domain | | 6M |
|  | b) | Derive the modified Z -transform of unit step and unit exponential inputs | | 6M |
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| 5. | a) | Design deadbeat algorithm for a process whose transfer function is given by & T=1sec. | | 6M |
|  | b) | Mention the advantages of PID control algorithm compared to other digital algorithms. Explain the operation of position PID control algorithm with the help of flow chart. Mention the advantages of velocity form over position form PID controller. | | 6M |
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| 6. | a) | Illustrate the operation of layered structure of DCS | | 8M |
|  | b) | Explain the configuration steps used in DCS | | 4M |
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| 7. | a) | Outline the various programming languages used in PLC | | 8M |
|  | b) | Explain the configuration steps used for PLC | | 4M |
|  | | | | |
| 8. | a) | What is meant by system identification? Explain the various steps involved in system identification in detail. | | 6M |
|  | b) | Suggest a suitable control system to control the dynamics of non-deterministic systems. With a neat block diagram explain the operation of control system. | | 6M |
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| 9. | a) | Distinguish between AI and EDP systems | | 4M |
|  | b) | Define Knowledge base system and explain the structure of expert system with neat diagram | | 8M |

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