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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

SUMMER TERM END TERM EXAMINATION - AUGUST 2024

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| **Semester :V** | **Date :06.08.2024** |
| **Course Code :ECE3007** | **Time :09:30 am to 12:30pm** |
| **Course Name :Control Systems** | **Max Marks :100** |
| **Program : BTech** | **Weightage :50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 2M=10M** | | | |
| 1 | Classification of Control Systems. | (CO 1) | [Knowledge] |
|  | | | |
| 2 | Classify the properties of signal flow graph. | (CO1) | [Knowledge] |
|  | | | |
| 3 | Draw the transient response specification. | (CO2) | [Knowledge] |
|  | | | |
| 4 | List the standard Test Inputs. | (CO2) | [Knowledge] |
|  | | | |
| 5 | Define concept of stability. | (CO3) | [Knowledge] |
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| 6 | What is Hurwitzs criterion? | (CO3) | [Knowledge] |
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| 7 | Define State space Equation. | (CO4) | [Knowledge] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 8 | Find the transfer function of the system represented by the signal flow graph | (CO1) | [Application] |
|  | | | |
| 9 | Reduce the block diagram and hence find the closed loop transfer function | (CO1) | [Application] |
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| 10 | Sketch the root locus of the system whose open loop transfer function is . | (CO3) | [Application] |
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| 11 | Write the differential equations governing the system shown below and hence find the transfer function | (CO1) | [Application] |
|  | | | |
| 12 | Check whether the system given below is controllable and observable | (CO4) | [Comprehension] |
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| 13 | Find the state space form of | (CO4) | [Application] |
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| 14 | For the closed loop transfer function, Find the Find the state space form of . | (CO4) | [Application] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 20M=40M** | | | |
| 15 | Find the zero-input response of the system for the given initial conditions | (CO4) | [Application] |
|  | | | |
| 16 | Sketch the Bode plot for the following transfer function and obtain the gain and phase cross over frequencies. | (CO3) | [Application] |
|  | | | |
| 17 | A unity feedback control system has an open loop transfer function  Sketch the root locus. | (CO3) | [Application] |
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