|  |  |  |
| --- | --- | --- |
| CMR INSTITUTE OFTECHNOLOGY |  |  |
|

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| USN | 1 | C | R |  |  |  |  |  |  |  |

 |
| Internal Assesment Test – 2 |
| Sub: Control Engineering | Code: 10ME82 |
| Date: 19/04/2018 | Duration: 90 mins | Max Marks: 50 | Sem: 8 | Branch (sections): ME (A,B) |
| Answer any ONE question from Part A and TWO questions from Part B. Good luck! |
| **PART A** | Marks | OBE |
| CO | RBT |
| 1  | Obtain the overall transfer function of the block diagram by reduction technique. C:\Users\CMRIT\Downloads\New Doc 2018-04-16.jpg | [10] | CO2 | L3 |
| 2  | Obtain the overall transfer function by using Mason’s gain formula. | [10] | CO2 | L3 |
|  | C:\Users\CMRIT\Downloads\New Doc 2018-04-16 (1).jpg |  |

|  |  |  |
| --- | --- | --- |
| CMR INSTITUTE OFTECHNOLOGY |  |  |
|

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| USN | 1 | C | R |  |  |  |  |  |  |  |

 |
| Internal Assesment Test – 2 |
| Sub: Control Engineering | Code: 10ME82 |
| Date: 19/04/2018 | Duration: 90 mins | Max Marks: 50 | Sem: 8 | Branch (sections): ME (A,B) |
| Answer any ONE question from Part A and TWO questions from Part B. Good luck! |
| **PART A** | Marks | OBE |
| CO | RBT |
| 1  | Obtain the overall transfer function of the block diagram shown in fig. 1 by reduction technique. C:\Users\CMRIT\Downloads\New Doc 2018-04-16.jpg | [10] | CO2 | L3 |
| 2  | Obtain the overall transfer function by using Mason’s gain formula. | [10] | CO2 | L3 |
|  | C:\Users\CMRIT\Downloads\New Doc 2018-04-16 (1).jpg |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 3 | **PART B**The open loop transfer function of a unity feedback system is $G\left(s\right)=\frac{K(s+2)}{s(s+4)(s+10)}$Find K to get PM = +30° | [20] | CO6 | L4 |
| 4 | Sketch the Bode plot for the transfer function$ G\left(s\right)H\left(s\right)=\frac{Ks^{2}}{\left(1+0.02s\right)(1+0.2s)}$Determine the value of K for the gain cross over frequency to be 5 rad/sec. | [20] | CO6 | L4 |
| 5 | For a certain feedback system $ G\left(s\right)H\left(s\right)=\frac{3\left(s+1\right)(s+6)}{s^{2}(s^{2}+18s+400)}$ .Sketch the Bode plot and comment on G.M, P.M and stability. | [20] | CO6 | L4 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 3 | **PART B**The open loop transfer function of a unity feedback system is $G\left(s\right)=\frac{K(s+2)}{s(s+4)(s+10)}$Find K to get PM = +30° | [20] | CO6 | L4 |
| 4 | Sketch the Bode plot for the transfer function$ G\left(s\right)H\left(s\right)=\frac{Ks^{2}}{\left(1+0.02s\right)(1+0.2s)}$Determine the value of K for the gain cross over frequency to be 5 rad/sec. | [20] | CO6 | L4 |
| 5 | For a certain feedback system $ G\left(s\right)H\left(s\right)=\frac{3\left(s+1\right)(s+6)}{s^{2}(s^{2}+18s+400)}$ .Sketch the Bode plot and comment on G.M, P.M and stability. | [20] | CO6 | L4 |