Assignment 4

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| Q1 | Reduce the block diagram shown in Figure to a single transfer function,  T(s) = C(s)/R(s)  Convert the block diagram in to signal flow graph. |  |
| Q2 | Find the closed-loop transfer function, T(s) = C(s)/R(s) for the system shown in Figure using block diagram reduction.  Convert the block diagram in to signal flow graph. |  |
| Q3 | Find the equivalent transfer function,  T(s) = C(s)/R(s), for the system shown in Figure.  Convert the block diagram in to signal flow graph. |  |
| Q4 | Reduce the system shown in Figure to a single transfer function, T(s) = C(s)/R(s)  Convert the block diagram in to signal flow graph. |  |
| Q5 | Find the transfer function, T(s) = C(s)/R(s), for the system shown in Figure. Using Block diagram reduction method. |  |
| Q6 | For the system shown in Figure, find the percent overshoot, settling time, and peak time for a step input if the system’s response is underdamped. Also justify that the response is underdamped. |  |
| Q7 | For the system shown in Figure find the output c(t), if the input r(t) is a unit step. |  |
| Q8 | For the system shown in Figure, find the closed poles  of the closed-loop transfer function, T(s) = C(s)/R(s). |  |
| Q9 | For the system of Figure, find the value of K that yields 10% overshoot for a step input. |  |
| Q10 | For the system shown in Figure, find K and α to yield a settling time of 0.15 second and a 30% overshoot |  |
| Q11 | For the system of Figure, find the values of K1 and K2 to yield a peak time of 1.5 second and a settling time of 3.2 seconds for the closed-loop system’s step response. |  |
| Q12 | Using Mason’s rule, find the transfer function,  T(s) = C(s)/R(s), for the system represented in Figure |  |
| Q13 | Using Mason’s rule, find the transfer function,  T(s) = C(s)/R(s), for the system represented in Figure |  |
| Q14 | Use Mason’s rule to find the transfer function of the system shown in Figure. |  |
| Q15 | Use **block diagram reduction** to find the transfer function and compare your answer with that obtained by Mason’s rule. |  |