Signals and Systems Quiz#2

Name: _____ ID No.: _____ 93/10/11

1. (10%) A system can be viewed as a process in which _____ signals are transformed by the system or cause the system to respond in some way, resulting in other signals as _____.

2. (10%) A system is said to be _____ if its output for each value of the independent variable at a given time is dependent on the input at only the same time.

3. (10%) Is the discrete system $y[n] = \sum_{k=-\infty}^{n} x[k]$ with or without memory? Answer Yes or No.

4. (10%) A system is said to be _____ if distinct inputs lead to distinct outputs.

5. (10%) Is the averaging system $y[n] = \frac{1}{2M+1} \sum_{k=-M}^{M} x[n-k]$ causal? Answer Yes or No.

6. (10%) If the input to a _____ system is bounded, then the output must also be bounded and therefore cannot diverge.

7. (10%) A system is time _____ if the behavior and characteristics of the system are fixed over time.

8. (20%) Please draw (a) a series-parallel interconnection of four systems; (b) a feedback interconnection of two systems.

9. (20%) A continuous-time linear system S with input $x(t)$ and output $y(t)$ yields the following input-output pairs:

$$x(t) = e^{j2t} \longrightarrow y(t) = e^{j3t},$$
$$x(t) = e^{-j2t} \longrightarrow y(t) = e^{-j3t}.$$

(a) If $x_1(t) = \cos(2t)$, determine the corresponding output $y_1(t)$ for system S.
(b) If $x_2(t) = \cos(2(t - \frac{1}{2}))$, determine the corresponding output $y_2(t)$ for system S.