



ISRA UNIVERSITY
Islamabad Campus

DEPARTMENT OF ELECTRICAL ENGINEERING

MID SEMESTER EXAMINATION - FALL 2018

Program: B.E. (Electrical)

Course Title: Signal & Systems

Total Marks: 30

Day & Date: Tue, November 13, 2018

Course Code: EE-313

Duration: 1 Hour 30 Min

Start Time: 0930 PST

(Use CAPITAL letters)

Student Name:	Invigilator's Name:
Student Signature:	Invigilator's Signature:
Student Regd. No:	Date:

Section-I

Multiple Choice Questions

Marks: 6

Time Allowed: 20 Minutes

Each statement is followed by four answers, marked A, B, C & D; only one of them is the best answer. Encircle the best answer. Each correctly circled best answer carries one mark. There is no negative marking for incorrect answer. No mark will be given for over writing, cutting or more than one encircled answers.

PLEASE DO NOT OPEN THE PAPER UNTIL ASKED TO DO SO

*******Good Luck*******

1. Signal is defined as:
 - a) A quantitative description of a physical phenomenon, event or the process.
 - b) A function represents a physical quantity or variable containing the information about the behavior and nature of the phenomenon.
 - c) A device or a set of rules defining the functional relation between the input and output.
 - d) Both (a) and (b) ✓

2. A system which is linear is said to obey the rules of:
 - a) Scaling
 - b) Additivity
 - c) Both scaling and additivity ✓
 - d) None of the above

3. In a time shift operation, if $t_0 > 0$ then:
 - a) The time shift is known as advance.
 - b) The time shift is known as delay. ✓
 - c) The signal is decimated.
 - d) None of the above.

4. Signals can be:
 - a) Digital
 - b) Analog
 - c) Either (a) or (b) ✓
 - d) None of the above.

5. A time invariant system is a system whose output:
 - a) Increases with a delay in input
 - b) Remains same with a delay in input ✓
 - c) Decreases with a delay in input
 - d) Vanishes with a delay in input

6. A system is said to be defined as non-causal, when:
 - a) The output at the present depends on the input at an earlier time.
 - b) The output at the present does not depend on the factor of time at all.
 - c) The output at the present depends on the input at a time instant in the future. ✓
 - d) The output at the present depends on the input at the current time.

7. All causal systems must have the component of:
 - a) Memory ✓
 - b) Time invariance
 - c) Stability
 - d) Linearity

8. The period of the signal $x(t) = 8 \sin\left(0.8\pi t + \frac{\pi}{4}\right)$ is:
- 0.4π s.
 - 0.8π s.
 - 2.5 s ✓
 - None of the above.
9. A signal $x(t)$ is said to be power signal if:
- $0 < P < \infty$ and $E = \infty$ ✓
 - $0 < P < E$ and $E = 0$
 - $0 < P < \infty$ and $E = 0$
 - None of the above
10. Given two continuous time signals $x(t) = e^{-t}$ and $h(t) = e^{-2t}$ which exists for $t > 0$, the convolution $y(t) = x(t) * h(t)$ is:
- $e^{-t} - e^{-2t}$ ✓
 - e^{-3t}
 - e^{+t}
 - $e^{-t} + e^{-2t}$
11. A signal cannot be both an energy signal and a power signal.
- False.
 - True. ✓
 - May be.
 - None of the above.
12. The discrete-time unit impulse function $\delta[n]$ is defined as:
- $\delta[n] = \begin{cases} 0 & \text{for } n = 0 \\ 1 & \text{for } n \neq 0 \end{cases}$
 - $\delta[n] = \begin{cases} 1 & \text{for } n = 0 \\ 0 & \text{for } n \neq 0 \end{cases}$ ✓
 - $\delta[n] = \begin{cases} 1 & \text{for } n > 0 \\ 0 & \text{for } n < 0 \end{cases}$
 - None of the above.
13. The convolution of $x(t)$ and $h(t)$ is defined by:
- $y(t) = \int_{-\infty}^{\infty} x(\tau)h(t - \tau)d\tau$
 - $y(t) = \int_{-\infty}^{\infty} [x(\tau) + h(t - \tau)]d\tau$
 - $y(t) = \int_{-\infty}^{\infty} x(\tau) - h(t - \tau)d\tau$
 - None of the above. ✓

14. Which mathematical notation specifies the condition of periodicity for a continuous time signal?
- a) $x(t) = x(t + T_0)$ ✓
 - b) $x(t) = x(-t)$
 - c) $x(n) = x(t + T_0)$
 - d) None of the above.
15. _____ data have discrete states and take discrete values?
- a) Analog
 - b) Digital ✓
 - c) Both (a) & (b)
 - d) None of the above.
16. _____ is the rate of change with respect to time.
- a) Time
 - b) Amplitude
 - c) Frequency ✓
 - d) None of the above.
17. If the output of the signal is double to that of the input signal, then it is called:
- a) Time Scaling
 - b) Amplitude Scaling ✓
 - c) Time Shifting
 - d) None of the above.
18. Frequency and period are _____.
- a) The same
 - b) Proportional to each other
 - c) Inverse of each other ✓
 - d) None of the above.