Solution of ECE 315 Test 12 F08

$$x[n] = u[n] - u[n-4] \overset{F}{\longleftrightarrow} X(F)$$
A

$$x[n] \overset{F}{\longleftrightarrow} X(F) = \delta_1(F) * \sum_{k=-4}^{4} |k| \delta(F - k/20)$$
B

$$x[n] \overset{F}{\longleftrightarrow} X(F) = j \sin(8\pi F)$$
C

$$x[n] = 10\,\mathrm{sinc}(n/12) \overset{F}{\longleftrightarrow} X(F)$$
D

$$x[n] = \mathrm{tri}(n/8) * \delta_4[n] \overset{F}{\longleftrightarrow} X(F)$$
E

$$x[n] = \mathrm{sinc}(n/3) * \mathrm{sinc}(n/6) \overset{F}{\longleftrightarrow} X(F)$$
F

$$x[n] = \mathrm{sinc}(n/3) * \mathrm{rect}_2[n] \overset{F}{\longleftrightarrow} X(F)$$
G

$$x[n] \overset{F}{\longleftrightarrow} X(F) = \mathrm{drcl}(F,3) \circledast \mathrm{drcl}(F,4)$$
H

Circle the correct answers to the following questions about the time and frequency-domain functions above.

1. Which $x[n]$'s are periodic? A B C D E F G H
   BE

2. Which $X(F)$'s are periodic? A B C D E F G H
   ABCDEFGH

3. Which $x[n]$'s have infinite energy? A B C D E F G H
   BE

4. Which $x[n]$'s are time-limited? A B C D E F G H
   (Time limited means having non-zero values only for a finite time.)
   ACH

5. Which $X(F)$'s are bandlimited? A B C D E F G H
   (Bandlimited means in the frequency range $|F| < 1/2$ there are non-zero values only for $|F| < F_0 < 1/2$.)
   BDEF

6. For which $x[n]$'s is $\sum_{n=-\infty}^{\infty} x[n] = 0$? A B C D E F G H
   BC

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$x[n] = \text{sinc}(n/3) * \text{rect}_2[n] \overset{F}{\longleftrightarrow} X(F)$
A

$x[n] \overset{F}{\longleftrightarrow} X(F) = \text{drcl}(F,3) \circledast \text{drcl}(F,4)$
B

$x[n] = u[n] - u[n-4] \overset{F}{\longleftrightarrow} X(F)$
C

$x[n] = \text{sinc}(n/3) * \text{sinc}(n/6) \overset{F}{\longleftrightarrow} X(F)$
D

$x[n] = 10\,\text{sinc}(n/12) \overset{F}{\longleftrightarrow} X(F)$
E

$x[n] \overset{F}{\longleftrightarrow} X(F) = \delta_1(F) * \sum_{k=-4}^{4} |k| \delta(F - k/20)$
F

$x[n] \overset{F}{\longleftrightarrow} X(F) = j\sin(8\pi F)$
G

$x[n] = \text{tri}(n/8) * \delta_4[n] \overset{F}{\longleftrightarrow} X(F)$
H

Circle the correct answers to the following questions about the time and frequency-domain functions above.

1. Which $x[n]$'s are periodic? A B C D E F G H
   FH

2. Which $X(F)$'s are periodic? A B C D E F G H
   ABCDEFGH

3. Which $x[n]$'s have infinite energy? A B C D E F G H
   FH

4. Which $x[n]$'s are time-limited? A B C D E F G H
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   (Bandlimited means in the frequency range $|F| < 1/2$ there are non-zero values only for $|F| < F_0 < 1/2$.)
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Solution of ECE 315 Test 12 F08

$x[n] \overset{F}{\longleftrightarrow} X(F) = \text{drcl}(F,3) \circledast \text{drcl}(F,4)$
A

$x[n] = \text{sinc}(n/3) * \text{rect}_2[n] \overset{F}{\longleftrightarrow} X(F)$
B

$x[n] = u[n] - u[n-4] \overset{F}{\longleftrightarrow} X(F)$
C

$x[n] = \text{sinc}(n/3) * \text{sinc}(n/6) \overset{F}{\longleftrightarrow} X(F)$
D

$x[n] = \text{tri}(n/8) * \delta_4[n] \overset{F}{\longleftrightarrow} X(F)$
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$x[n] \overset{F}{\longleftrightarrow} X(F) = j\sin(8\pi F)$
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G

$x[n] \overset{F}{\longleftrightarrow} X(F) = \delta_1(F) * \sum_{k=-4}^{4} |k| \delta(F - k/20)$
H

Circle the correct answers to the following questions about the time and frequency-domain functions above.

1. Which $x[n]$'s are periodic? A B C D E F G H
   EH

2. Which $X(F)$'s are periodic? A B C D E F G H
   ABCDEFGH

3. Which $x[n]$'s have infinite energy? A B C D E F G H
   EH

4. Which $x[n]$'s are time-limited? A B C D E F G H
   (Time limited means having non-zero values only for a finite time.)
   ACF

5. Which $X(F)$'s are bandlimited? A B C D E F G H
   (Bandlimited means in the frequency range $|F| < 1/2$ there are non-zero values only for $|F| < F_0 < 1/2$.)
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