Course No: TEC1304
Course Title: Understanding Telecom.
Date: 21 / 05/ 2013
No. of Questions: 4
Time: 2 hours
Using Calculator (YES)

University of Palestine

FINAL Exam
2012/2013
Total Grade: 100

Instructor Name: Dr. Anwar Mousa
Student No.: _____
Student Name: _____
College Name: Faculty of IT
Dep. / Specialist: _____
Using Dictionary (No)

- ***Answer all Questions***

First Question — No. of Branches (2) — (20/100)

Q1 B1 **(10/20)**

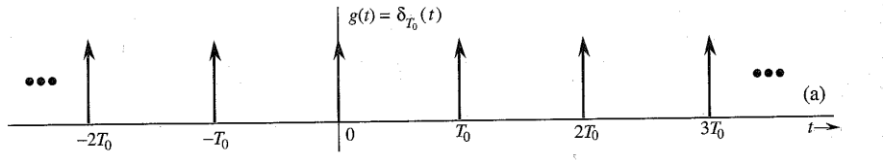
Compare the expressions of the trigonometric Fourier series for a signal *g(t)* and the compact trigonometric Fourier series.

Q1 B2 **(10/20)**

Show the relation between the coefficients of the exponential Fourier series and the compact trigonometric Fourier series for a signal

Second Question — No. of Branches (1) — (25/100)

Q2 B1



For the above periodic impulse train:

a. **Find the compact Fourier series and sketch the corresponding spectra.**
b. **Find the exponential Fourier series and sketch the corresponding spectra.**
c. **Compare the two spectra.**

Third Question — No. of Branches (3) — (25/100)

Q3 B1 **(5/25)**

Find the Fourier transform of $\delta(t)$

Q3 B2 **(10/25)**

Find the Fourier transform of the sinusoid $\delta(t - t_0)$

Q3 B3 **(10/25)**

Find the inverse Fourier transform of $\delta(\omega - \omega_0)$.

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Fourth Question — No. of Branches (2) — (30/100)

Q4 B1 **(15/30)**

If $g(t) \xrightarrow{FT} G(\omega)$ **then find the Fourier Transforms (FT) of**

a. $g(-t)$

b. $g(3t)$

c. **Based on *b.*, if a signal is compressed by a factor of 3 in time domain, explain what happens to its spectra (frequency domain).**

Q4 B2 **(15/30)**

$g(t)$ **is a power signal and input to a linear time-invariant system whose impulse response is** *h(t).* **If** $z(t)$ **is the corresponding output:**

a. Express the output as a function of the input and impulse response in time and frequency domains

b. Find out the power spectral density of the output signal. And write down the power expression of the output signal as a function of the power spectral density.

End of Questions

Good Luck