

Max Marks: 30

22/11/2017

APL103 – EXPERIMENTAL METHODS

Major

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Entry #: 2016TT10898

Question 1 (4 Marks): Draw the graph for the Fourier series of:

$$f(x) = |x|$$

given: $-2 < x < 2$ and $f(x+4) = f(x)$

Question 2 (6 Marks): Give the Fourier series for:

$$f(x) = x$$

given: $0 < x < 4$ and $f(x+4) = f(x)$

Question 3 (5 Marks): Following sound pressure levels were observed for a machine operating in a noisy environment:

SPL of machine + Background noise = 90 dB

SPL of the Background noise = 80 dB

Determine the SPL of the machine alone.

Question 4 (5 Marks): List the parameters you will choose for condition monitoring of a steam turbine, also briefly explain the reason behind our selection.

Question 5 (5 Marks): Explain and sketch the working of ultrasonic method related to the condition monitoring of a component.

Question 6 (5 Marks): Explain and sketch the working of a Band pass filter as discussed in the class. Also explain how you can design a band pass filter to search for a frequency of interest from a random signal.

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NOTE: IF you think something is missing, please feel free to assume the data. But do not forget to clearly mention your assumption/s.