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Submission Deadline : 28/10/2020 09:58

First Quiz C

Q.1 [MCQ, 3 Marks, Put the correct option(s) in the Box] Which of the following statement(s) is (are) true.

- a) The function $f : [0, 1] \rightarrow \mathbb{R}$ defined as $f(x) = \frac{1}{n}$, on $x \in (\frac{1}{n+1}, \frac{1}{n}]$, $\forall n \in \mathbb{N}$ and $f(0) = 0$, is not piecewise continuous.
- b) The function $f : [0, 1] \rightarrow \mathbb{R}$ defined as $f(x) = x \sin(\frac{1}{x})$, $x \neq 0$ and $f(0) = 0$, is piecewise continuous.
- c) If the fundamental period of f is 2, then the fundamental period of f^{2020} is also 2.
- d) None of the above.

This is a long answer type question. You can either upload a file or type your answer below.

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or

a, b

Q.2 [Descriptive Question, 5 Marks] Consider the function $f(x) = 1$ on $(-\frac{\pi}{2}, \frac{\pi}{2})$, and $f(x) = 0$ on $[-\pi, -\frac{\pi}{2}] \cup [\frac{\pi}{2}, \pi]$. Using this function find the value of the following series:

$$\sum_{n=0}^{\infty} \frac{\sin^2\left(\frac{(2n+1)\pi}{2}\right)}{(2n+1)^2}$$

This is a long answer type question. You can either upload a file or type your answer below.

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or

Q.3 [MCQ, 3 Marks, Put the correct option(s) in the Box] Consider the function $f(x) = \sin^2(x)$ on real line. Then

- a). fundamental period of f is 2π .
- b). f is not a periodic function.
- c). fundamental period of f is π
- d). f is an infinitely many times differentiable function.
- e). None of the above.

This is a long answer type question. You can either upload a file or type your answer below.

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c, d

a) $h(3) = 2$
b) $h(3) = 36$
c) $g(3) = -2$
d) $g(3) = -36$
e) None of the above.

UPLOAD A FILE

A screenshot of the CKEditor toolbar and text area. The toolbar is at the top, containing icons for undo, redo, bold, italic, underline, strikethrough, link, unlink, source, and others. Below the toolbar, the text area contains the text "a, C".

1. Calculate the Fourier coefficients a_0, a_n and b_n , of f .
2. Hence find the value of the series $1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \frac{1}{9^2} + \dots$

UPLOAD A FILE

A screenshot of the CKEditor toolbar. The toolbar contains various icons for text editing (bold, italic, underline, strikethrough, subscript, superscript, text color, background color), undo/redo, indent/outdent, list creation, link/unlink, source code, and help. Below the icons is a row of buttons for text formatting: Bold (B), Italic (I), Underline (U), Strikethrough (ABC), Subscript (x₂), Superscript (x²), and Text Color (I_x). To the right of these are buttons for bulleted list, numbered list, decrease indent, increase indent, and double quote. Further right are dropdown menus for 'Styles' and 'Normal', and a help button with a question mark. The bottom status bar shows 'div p'.

SUBMIT