Moda
MAA4226 MAA5228 **Quizzes Q** 26Sep2010

Q1: Fri. 3 Sep Let E be the set $\left\{5+\left[[-1]^n\cdot\frac{3n-1}{n}\right]\right\}_{n\in\mathbb{Z}_+}$. Then $\sup_{\mathbb{R}}(E)=$ ______ and $\inf_{\mathbb{R}}(E)=$ ______.

Q2: Wed. 8 Sep A ***TOS*** [***totally ordered set***] $(\Omega,\prec)$ satisfies axioms [Rather than use words such as "symmetric", write each axiom *precisely*, using quantification]: [Imagine 3 blank lines].

A TOS $(\Omega,\prec)$ has the GLBP IFF [Remember Qfn!]: ______ [Imagine 3 blank lines].

Q3: Mon. 29Nov Please write **DNE** in a blank if the described object does not exist or if the indicated operation cannot be performed.

a) The MacSe of $\frac{1}{1-5x^3}$ has RoC= ______.
MacSe(x)= ______.

Write the first 5 non-zero terms,
e.g, $8x^3+\frac{1}{8}x^6+\frac{3}{2}x^8-x^{12}-7x^{15}+\cdots$.

b) $\sum_{n=0}^{\infty}\left[\frac{4-3\boldsymbol{i}}{5}\right]^n=$ ______ $+\left[\boldsymbol{i}\cdot\right.$ ______ $\left.\right]$.

Q4: Fri?. 21 Jan? i) A TS Ω is ***connected*** if ...: [Define all terms you use.] [Imagine 5 blank lines].

ii) In TS Ω we have a point $p\in\Omega$ and sets $\{E_n\}_{n=1}^{\infty}$. For each n, our E_n owns p, and is connected. Prove that $X:=\bigcup_{n=1}^{\infty}E_n$ is connected.

Q5: Fri. 28 Jan *Am I in class today?*

circle one "Yes!" "Of course!"

Q6: Fri. 04 Feb *Am I in class today?*

circle one "Yes!" "Of course!"

Q7: Wed. 9Feb a) OYOSOP, state the Cauchy Mean-Value Theorem on the closed interval $J:=[4,7]$.

b) OYOSOP, state Liouville's Thm: *Suppose* $\boldsymbol{\alpha}\in\mathbb{R}$ *is an algebraic number of degree* $\mathfrak{D}:=\mathrm{Deg}(\boldsymbol{\alpha})\overset{note}{\geqslant}2$. *Then* ...

Q8: Mon. 14Mar $S:=\mathbb{D}\cap(0,1)$ is circle $\mathcal{F}_\sigma$ $\mathcal{G}_\delta$, because circle an operator
$S=\bigcap\bigcup_{n=1}^{\infty}E_n$, where E_n *is* ______

Q9: Wed. 16Mar For $n=2,3,4,\ldots$, let $g_n\colon[0,1]\to\mathbb{R}$ be the P.L fnc with these cutpoint and height tuples:

$$\vec{\mathbf{p}}:=(0,1/n^3,1/n^2,1)\quad\text{and}$$
$$\vec{\mathbf{h}}:=(0,\quad n,\quad 0,\quad 0).$$

Circle those senses in which seq $(g_n)_{n=1}^{\infty}$ converges:
pointwise $\|\cdot\|_3$ $\|\cdot\|_2$ $\|\cdot\|_1$ $\|\cdot\|_{\sup}$

Q10: Fri ?. 18Mar ? *Create world some peace.*

§A Potential quiz/exam problems

Some of these may appear on quizzes/exams; naturally, with different data. *Please write **DNE** in a blank if the described object does not exist or if the indicated operation cannot be performed.*

I1) On $J:=[3,7]$, we have partition P with cutpoints $p_0=3<p_1<\cdots<p_9=7$. For fnc $g\colon J\to\mathbb{R}$, the defn of $\mathrm{Osc}^g(\mathsf{P})$ is: [Imagine 5 blank lines]

I2) Interval $J:=[-3,\boldsymbol{\pi}]$ has ptn P with cutpoints $\{-3,1,\boldsymbol{\pi}\}$. Define $\alpha:=[x\mapsto\sqrt[3]{x}\cdot\mathbf{1}_{\mathbb{Q}}(x)]$. Then $\mathrm{Osc}^\alpha(\mathsf{P})=$ ______ $+$ ______.

Equipping P with sample points $\{-2,\boldsymbol{\pi}/2\}$, now $\mathrm{RS}^\alpha(\mathsf{P})=$ ______.

I3) Prove: *Suppose* $f\in\mathrm{RI}(J\to\mathbb{R})$ *and* $L>0$, *where* $L:=\left[\inf_{x\in J}|f(x)|\right]$. *Prove that* $1/f$ *is integrable.*