MATH 132 **EXAMINATION III** **FALL 2008**

This exam should have 18 questions . Part I will have 16 multiple choice questions , 5 points each . Part II will have 2 handgraded questions , 10 points each . Please check to see that your exam is complete . If you do not have a **PENCIL** to mark your card , please ask to borrow one from your proctor .

Write your **ID NUMBER** (not your SS number) on the six blank lines on the top of your answer card , using one blank for each digit . **Shade in the corresponding boxes below** . Also **Print your name at the top of your card** .

PART I : (80 points)

1) Find the sum of the series , $\frac{4}{9} + \frac{4}{27} + \frac{4}{81} + \frac{4}{243} + \ldots$, if it converges .

A) $\frac{5}{2}$
B) $\frac{7}{2}$
C) $\frac{10}{9}$
D) $\frac{3}{4}$
E) $\frac{5}{4}$
F) $\frac{7}{4}$
G) $\frac{3}{2}$
H) $\frac{4}{3}$
I) $\frac{5}{3}$
J) *diverges*

2) Find the **limit** of the sequence $\left\{ \frac{1}{(1/10)^n} \right\}_{n=1}^{\infty}$, if it converges .

A) 0
B) 1
C) $\frac{10}{9}$
D) $\frac{100}{9}$
E) $\frac{211}{9}$
F) 200
G) $\frac{1}{9}$
H) $\frac{1}{27}$
I) $\frac{1}{81}$
J) diverges

3) Determine whether the **sequence** $\left\{\cos(\frac{1}{n}) + n \cdot sin(\frac{1}{n})\right\}_{n=1}^{\infty}$ **converges** or **diverges** . If it converges then **find the limit** .

A) $\frac{2}{3}$
B) $\frac{1}{2}$
C) 3
D) 4
E) $\frac{2}{5}$
F) 2
G) 0
H) $\frac{3}{5}$
I) 1
J) diverges

4) Find the **sum** of the series $\sum_{n=1}^{\infty} \frac{1+2^n}{3^n}$, if it converges .

A) 1

B) 1.5

C) 2

D) 2.5

E) 3

F) 3.5

G) 4

H) 4.5

I) 5

J) diverges

5) Which of the following three series is **convergent ?**

I) $\sum_{n=1}^{\infty} \frac{n+2}{n^{3/2}}$ *II)* $\sum_{n=2}^{\infty} \frac{1}{n \cdot ln(n)}$ *III)* $\sum_{n=1}^{\infty} \frac{n}{\sqrt{1+n^2}}$

A) *I* B) *II* C) *III* D) *I* & *II* E) *I* & *III* F) *II* & *III* G) *I*, *II* & III H) all diverge

6) If $s = \sum_{n=1}^{\infty} \frac{1}{n^3}$ *and* $s_{10} = \sum_{n=1}^{10} \frac{1}{n^3}$ (10^{th} partial sum) then from **bounds for the remainder** in the **integral test** , we know that $|s - s_{10}|$ is **less than :**

A) 0.01

B) 0.001

C) 0.002

D) 0.03

E) 0.004

F) 0.05

G) 0.005

H) 0.06

I) 0.007

J) 0.07