Math 104 - Rimmer
Hand in Hw # 11

Name___________________________________
Recitation Number________________

Spring 2013

PROBLEM 12: Determine whether the following series converge or diverge

$$\text{(i)} \quad \sum_{n=1}^{\infty} (\ln(2n) - \ln n) \quad \text{(ii)} \quad \sum_{n=1}^{\infty} \frac{1}{n^{\pi}} \quad \text{(iii)} \quad \sum_{n=1}^{\infty} \frac{(\cos(n))^2}{\sqrt{n^5}}$$

You must explain your reasoning for each series, even if you can deduce the answer by process of elimination.

(a) All series converge
(b) (i) and (iii) diverge; (ii) converges
(c) (i) and (ii) diverge; (iii) converges
(d) All series diverge
(e) (ii) and (iii) converge; (i) diverges
(f) (ii) converges; (i) and (iii) diverge

Math 104 - Rimmer
Hand in Hw # 11

Name____________________________________

Recitation Number________________

Fall 2012

9. Which of the assertions below hold for the following series:

$$\text{I}: \quad \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}} \qquad \text{II}: \quad \sum_{n=1}^{\infty} \frac{n}{\sqrt{7n^5 - 6n}} \qquad \text{III}: \quad \sum_{n=0}^{\infty} \frac{2^n - 5^n}{3^n + 4^n}$$

(a) I, II, III are convergent (b) I, II, III are divergent (c) only I converges

(d) only I and II converge (e) only I and III diverge (f) only III converges

Math 104 - Rimmer Name___________________________________
Hand in Hw # 11 Recitation Number________________

Spring 2012

2. Determine whether the following series are convergent or divergent. For full credit be sure to explain your reasoning and tell what test was used.

$$\text{(I)}\sum_{n=1}^{\infty}\frac{e^{1/n}}{n^2} \qquad \text{(II)}\sum_{n=1}^{\infty}\left(\frac{8n}{5+7n}\right)^n \qquad \text{(III)}\sum_{n=1}^{\infty}\frac{\arctan(n)}{\sqrt{n^7}}$$

	(I)	(II)	(III)
A)	convergent	convergent	convergent
B)	convergent	convergent	divergent
C)	convergent	divergent	convergent
D)	convergent	divergent	divergent
E)	divergent	convergent	convergent
F)	divergent	convergent	divergent
G)	divergent	divergent	convergent
H)	divergent	divergent	divergent

Name____________________________________
Recitation Number________________

Fall 2011

14 Which of the following series converge?

$$\text{(I)} \sum_{n=2}^{\infty} \frac{\ln n}{n^3} \qquad \text{(II)} \sum_{n=2}^{\infty} \frac{n^3}{\ln n} \qquad \text{(III)} \sum_{n=1}^{\infty} \frac{n}{2^n} \qquad \text{(IV)} \sum_{n=1}^{\infty} e^{1/n}$$

(A) I & II	(B) I & III	(C) I & IV	(D) II & III
(E) II & IV	(F) III & IV	(G) all four of them	(H) none of them

Math 104 - Rimmer Name___________________________________
Hand in Hw # 11 Recitation Number________________

Spring 2011

14. The series

$$\sum_{n=1}^{\infty} \frac{10n^3 2^{n+4}}{\pi^n}$$

(a) converges by the alternating series test.
(b) diverges by the alternating series test.
(c) converges by the ratio test.
(d) diverges by the ratio test.
(e) converges because the terms approach 0.
(f) diverges because the terms do not approach 0.

Math 104 - Rimmer
Hand in Hw # 11

Name___________________________________
Recitation Number________________

Fall 2010

10. Which statement is true for

$$\text{(I)} \sum_{n=1}^{\infty} e^n \qquad \text{(II)} \sum_{n=1}^{\infty} \frac{1}{n^e} \qquad \text{(III)} \sum_{n=1}^{\infty} \frac{(n!)^2}{(2n)!} \qquad \text{(IV)} \sum_{n=1}^{\infty} \frac{n^2}{n^2+1}.$$

(A) All four series converge.

(B) None of the series converge.

(C) Only (I) and (II) converge.

(D) Only (I) and (III) converge.

(E) Only (I) and (IV) converge.

(F) Only (II) and (III) converge.

(G) Only (II) and (IV) converge.

(H) Only (III) and (IV) converge.

Math 104 - Rimmer
Hand in Hw # 11

Name___________________________________
Recitation Number________________

Spring 2010

16. The series $\sum_{n=1}^{\infty} \frac{n^n}{n!}$

(a) converges because the terms approach 0.
(b) diverges because the terms do not approach 0.
(c) converges by the alternating series test.
(d) diverges by the alternating series test.
(e) converges by the comparison test.
(f) diverges by the geometric series test.

Math 104 - Rimmer Name___________________________________
Hand in Hw # 11 Recitation Number________________

Spring 2010

17. The series $\sum_{n=1}^{\infty}(-1)^n \frac{(n+3)2^{2n}}{3^{n+100}}$

(a) converges absolutely by the ratio test.
(b) converges conditionally (but not absolutely) by the ratio test.
(c) diverges by the ratio test.
(d) converges absolutely by comparison with $\sum_{n=1}^{\infty} \frac{1}{3^n}$.
(e) converges conditionally (but not absolutely) by comparison with $\sum_{n=1}^{\infty}(-1)^n \frac{n+3}{3^n}$.
(f) diverges by comparison with $\sum_{n=1}^{\infty}(-1)^n 4^n$.

Math 104 - Rimmer
Hand in Hw # 11

Name___________________________________
Recitation Number________________

ANSWERS:

Spring 2013 # 12: E

Fall 2012 # 9: D

Spring 2012 # 2: C

Fall 2011 # 14: B

Spring 2011 # 14: C

Fall 2010 # 10: F

Spring 2010 # 16: B

Spring 2010 # 17: C