MT224 Differential Equations (Call-II)

Friday, September 27, 2019

Course Instructors

Arfan Shahzad

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Serial No:

Mid Term-I Exam

Total Time:60 Min

Total Marks: 30

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Signature of Invigilator

Roll No	Section	Signature

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.

Instructions:

1. Verify at the start of the exam that you have a total of six (6) questions printed on seven (07) pages including this title page.
2. Attempt all questions on the question-book and in the given order.
3. The exam is closed books, closed notes. Please see that the area in your threshold is free of any material classified as 'useful in the paper' or else there may a charge of cheating.
4. Read the questions carefully for clarity of context and understanding of meaning and make assumptions wherever required, for neither the invigilator will address your queries, nor the teacher/examiner will come to the examination hall for any assistance.
5. Fit in all your answers in the provided space. You may use extra space on the last page if required. If you do so, clearly mark question/part number on that page to avoid confusion.
6. Use only your own stationery and calculator. If you do not have your own calculator, use manual calculations.
7. Use only permanent ink-pens. Only the questions attempted with permanent ink-pens will be considered. Any part of paper done in lead pencil cannot be claimed for checking/rechecking.

	Q-1	Q-2	Q-3	Q-4	Q-5	Q-6	Total
Total Marks	05	05	05	05	05	05	**30**
Marks Obtained							

Vetted By: _____ **Vetter Signature:** _____

University Answer Sheet Required: **No** ☐ **Yes** ☐

Question # 1	05 Points

Determine the convergence or divergence of the given sequences.

a. $a_n = \frac{\ln(n^2+1)}{\sqrt{n}}$

b. $a_n = \frac{2^n+4^n}{3^n+4^n}$

Question # 2	05 Points

If possible, Find the sum of series $\sum_{n=1}^{\infty} \frac{\sqrt{n+1}-\sqrt{n}}{\sqrt{n^2+n}}$.

Question # 3	05 Points

Determine the convergence or divergence of the series $\sum_{n=1}^{\infty}(-1)^n \frac{n^2(n+2)!}{n!3^{2n}}$.

Question # 4	05 Points

Determine the convergence or divergence of the series $\sum_{n=1}^{\infty} \frac{7}{(2n+5)^n}$.

Question # 5	05 Points

Determine, whether the series $\sum_{n=2}^{\infty}(-1)^{n+1}\frac{1}{n\,ln(n)}$ converges absolutely, converges conditionally or diverges?

Question # 6	05 Points

Find the Maclaurin series expansion of the function $f(x) = \frac{e^x + e^{-x}}{2}$.