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| **ASSIGNMENT** | |
| **Course Code** | ECC201A |
| **Course Name** | Signals and Systems |
| **Programme** | B.Tech |
| **Department** | CSE |
| **Faculty** | FET |

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| **Reg. No** | 17ETCS002159 |
| **Semester/Year** | 03/2018 |
| **Course Leader/s** | Ms. Prafulla Kumari |

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| **Declaration Sheet** | | | | | | | | |
| Student Name | Satyajit Ghana | | | | | | | |
| Reg. No | 17ETCS002159 | | | | | | | |
| Programme | B.Tech | | | | | Semester/Year | 04/2019 | |
| Course Code | ECC201A | | | | | | | |
| Course Title | Signals and Systems | | | | | | | |
| Course Date |  | | to | |  | | | |
| Course Leader | Ms. Prafulla Kumari | | | | | | | |
| **Declaration**  The assignment submitted herewith is a result of my own investigations and that I have conformed to the guidelines against plagiarism as laid out in the Student Handbook. All sections of the text and results, which have been obtained from other sources, are fully referenced. I understand that cheating and plagiarism constitute a breach of University regulations and will be dealt with accordingly. | | | | | | | | |
| Signature of the Student | |  | | | | | Date |  |
| Submission date stamp  (by Examination & Assessment Section) | |  | | | | | | |
| Signature of the Course Leader and date | | | | Signature of the Reviewer and date | | | | |
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# **Question No. 1**

**Solution to Question No. 1 Part A:**

**“Discrete Cosine Transform for Audio Signal Processing”**

## A 1.1 Introduction:

Overview to the question (students are expected to give a brief introduction to the context on which the question is set, applications, limitations, new developments happening and students own views on the question and the paragraph should not exceed 200 words and references should be cited and it should be authored by the students means to say students should not be borrowing sentences as they are from any referred literature)

## A 1.2 Application:

Students are expected to provide the solution to the question considering the points mentioned in the marking scheme of the assignment question

## A 1.3 Conclusion:

Students are expected to discuss the solutions obtained in section 1.2 and present their views/suggestions/recommendations (not to exceed 150 words)

# **Question No. 2**

**Solution to Question No. 1 Part B:**

## B 1.1 Formulate and solve the Difference Equation using the given data:

Given that the traffic during the current hour depends on the traffic during past two hours and on external factors. The external factors are found to be of the form .

The Difference Equation can be formulated as,

The values given are:

Hence the Equation becomes,

The Auxiliary Equation for is,

The Natural Response is,

Given,

The Forced Response is,

Substituting these in

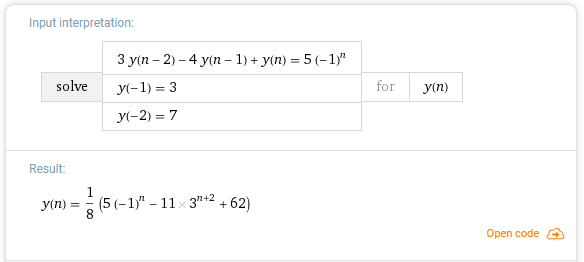
The Total Response is,

Given the boundary conditions,

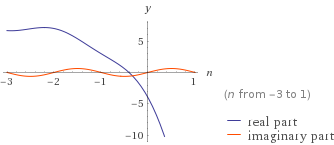
Substituting these values into

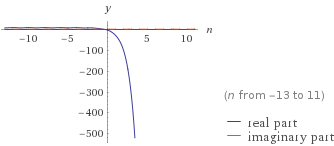
From and ,

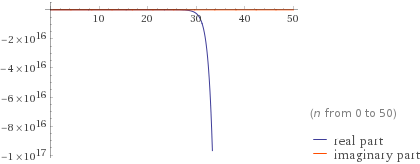
Hence the Final Equation becomes,



## B 1.2 Plot the traffic as a function of :







## B 1.3 Comment on the variability of the traffic using the solution:

Students are expected to discuss the solutions obtained in section 1.2 and present their views/suggestions/recommendations (not to exceed 150 words)

# **Question No. 3**

**Solution to Question No. 2 Part B:**

Given data:

: Amplitude 6, from t = -1 to t = 1

: Amplitude 2, from t = 0 to t = 2

: Amplitude 4, from t = 2 to t = 3

## B 2.1 Compute the Laplace Transforms , and :

Overview to the question (students are expected to give a brief introduction on the context on which the question is set, applications, limitations, new developments happening and students own views on the question and the paragraph should not exceed more than 200 words and references should be cited and it should be authored by the students means to say students should not be borrowing sentences as they are from any referred literature)

## B 2.2 Compute the response of the system when only is transmitted over :

Students are expected to provide the solution to the question considering the points mentioned in the marking scheme of the assignment question

## B 2.3 Recover the message signal from :

Students are expected to discuss the solutions obtained in section 1.2 and present their views/suggestions/recommendations (not to exceed 150 words)

## B 2.4 Analyze the effect of change in operation between the message and the watermark on the response and are convolved instead of being added:

Students are expected to draw conclusions based on the discussions and suggestions (not to exceed 100 words)

**Bibliography**

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All referencing, bibliography needs to be done as described in the following article:

<http://www.msruas.ac.in/pdf_files/VCBlogs/Academic%20Good%20Practices.pdf>