

# Faculty of Science & Humanities

# Semester End Examination Question Paper – B. Tech.

**Department :** Mathematics

**Programme :** B. Tech.

**Semester/Batch :** 3rd /2016

**Examination Date** : 15th December 2017

**Course Code :** BSC207A

**Course Title :** Engineering Mathematics - 3

**Semester End Examination-MATLAB**

**INSTRUCTIONS TO STUDENTS:**

1. Answer all questions.
2. Use only SI units.
3. Use of non-programmable scientific calculator is permitted.
4. Use of data handbook permitted wherever applicable.
5. Missing data may be appropriately assumed.
6. Indicate the question numbers clearly against your answers.

**Maximum Duration: 2 Hour Maximum Marks: 50**

**IMPORTANT:**

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No.** | **a** | | **b** | | **c** | | **Max. Marks** | **Marks Awarded** | |
| **Examiner-1** | **Examiner-2** |
| **1** |  |  |  |  |  |  | **10** |  |  |
| **2** |  |  |  |  |  |  | **10** |  |  |
| **3** |  |  |  |  |  |  | **10** |  |  |
| **4** |  |  |  |  |  |  | **10** |  |  |
| **5** |  |  |  |  |  |  | **10** |  |  |
| **Total Marks** | | | | | | | **50** |  |  |
| **25** |  |  |
| **Signature with date** | | | | | | | |  |  |

**Question No. 1 (ILO1&2) (3+3+4 =10 Marks)**

Solve the following problems by using built-in MATLAB command:

1. Obtain the Fourier transform of the function
2. Determine the Laplace transform of the function
3. Plot the vector field in theinterval

.

**Question No. 2 (ILO4) (4+6=10 Marks)**

Write a MATLAB function to plot the following periodic functions:

1. , in the interval.
2. , in the interval .

**Question No. 3 (ILO4) (7+3=10 Marks)**

For the given data set of a periodic function of period, answer the following:

|  |  |  |  |  |  |  |  |  |
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|  |  |  |  | 5.3 |  |  |  |  |

1. Write a MATLAB code to determine the Fourier series up to the third harmonic.
2. Plot the data set and the Fourier series in the same graph. Comment on the graph.

**Question No. 4(Manual calculation) (ILO4) (10 Marks)**

Determine the complex Fourier series expansion of the periodic function defined by

.

**Question No. 5 (ILO4) (7+3=10 Marks)**

For the given periodic function in question 4, answer the following:

1. Write a MATLAB code to determine the complex Fourier series.
2. Plot the periodic function and the complex Fourier series in the same figure for the interval. Comment on the plot.

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