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| **Scheme of Valuation/Answer Key**(Scheme of evaluation (marks in brackets) and answers of problems/key) |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**FIFTH SEMESTER B.TECH (S) DEGREE EXAMINATION, MAY 2019 |
| **Course Code: EE307** |
| **Course Name: SIGNAL AND SYSTEMS** |
| Max. Marks: 100 |  | Duration: 3 Hours |
| **PART A** |
|  |  | ***Answer all questions, each carries5 marks.*** | Marks |
| 1 |  | Explanation with example – 5 marks | (5) |
| 2 |  | $X\left(s\right)=\frac{2s+5}{(s+3)(s+2)}$ – 4marksROC: $σ>-2$ – 1mark | (5) |
| 3 |  | Statement – 1 markProof – 4 marks | (5) |
| 4 |  | Explanation with block diagram – 5 marks | (5) |
| 5 |  | $X\left(z\right)=\frac{z}{z-a}$ – 3 marks ROC: |z| > |a| - 1 mark | (5) |
| 6 |  | Statement – 1 markProof – 4 marks | (5) |
| 7 |  | Converting to Fourier transform – 3 marks$x\left(n\right)=3\left(\frac{1}{2}\right)^{n}u\left(n\right)-2 \left(\frac{1}{3}\right)^{n}u(n)$ – 2 marks | (5) |
| 8 |  | Any 3 types of nonlinearities – 5 marks | (5) |
| **PART B** |
| ***Answer any twofull questions, each carries10 marks.*** |
| 9 |   | Any 5 types of signals with example – 10 marks | (10) |
| 10 |  | Conversion to laplace transform and partial fraction – 4 marks$y\left(t\right)=\frac{1}{2}u\left(t\right)+\frac{25}{4}e^{-4t}-\frac{25}{3}e^{-3t}$ – 6 marks | (10) |
| 11 |  | Check for causality, linearity and time invariance – 6 marksSystem is non causal, linear and time variant- 4 marks | (10) |
| **PART C** |
| ***Answer any twofull questions, each carries10 marks.*** |
| 12 |  | T = $π$ $ω=2$ – 1 markFormula – 2 marksCalculation of Fourier coefficients – 5 marksFinal expression – 2 marks | (10) |
| 13 |  | 1. Convolution sum – 2marks

$y\left(n\right)=\left\{6,5,3,11,14,6\right\}$ – 4 marks1. Equation -1 mark (4)

Transform – 3mark | (6) |
| 14 |  | Any 5 properties with proof – 10 marks | (10) |
| **PART D** |
| ***Answer any twofull questions, each carries 10 marks.*** |
| 15 |  | $x\left(n\right)=2(-1)^{n}-(-2)^{n}$ – 7marksFor n<0, x(n) =0 – 3 marks | (10) |
| 16 | a) | Formula – 1 markDTFT is $\frac{1}{1-2e^{-jω}}$ – 4 marks | (5) |
|  | b) | Any 3 properties – 5 marks | (5) |
| 17 | a) | Initial value = 0 – 2.5 marksFinal value = ½ - 2.5 marks | (5) |
|  | b) | Properties of DTFT – 5 marks | (5) |
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