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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**  V SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018 | | | | | |
| **Course Code: AE307** | | | | | |
| **Course Name: SIGNALS AND SYSTEMS** | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
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| **PART A** | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | Marks |
| 1 | a) | (i)= 6/8=; A rational number is periodic.  (ii) Steps  Even=  Odd= | | | (2)  (1)  (1)  (1) |
|  | b) | (i)Equation &Calculation.  Energy signal ; E=1/6; P=0  (ii)Equation& Calculation  Power signal; E=infinity; P=1/2 | | | (1.5)  (1)  (1.5)  (1) |
|  | c) | (i)    (ii) | | | (2.5)  (2.5) |
| 2 | a) | (i) Causal  Stable  (ii) not causal  Not stable  (iii) not causal  Stable  (iv) Not causal  h(n) ≠ 0 ; for n<0  Stable | | | (2)  (2)  (2)  (2) |
|  | b) | i) Non linear, Justification  (ii) Non Linear, Justification  (iii) Linear, Justification | | | ( 1)  ( 1)  ( 1)  ( 1) |
|  | c) | (i) Time variant  (ii) Time variant | | | (1.5)  (1.5) |
| 3 | a) | Equation  Diagrams and steps  Answer | | | (1)  (3.5)  (3) |
|  | b) | Steps and calculations | | | (6)  (1.5) |
| **PART B** | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | |
| 4 | a) | Equations  Diagram  Explanation | | | (2)  (1)  (4.5) |
|  | b) | Explanation | | | (7.5) |
| 5 | a) | Explanation with equation.  Properties | | | (3.5)  (4) |
|  | b) | Sampling theorem  Aliasing  Reconstruction filter | | | (2.5)  (2.5)  (2.5) |
| 6 | a) | N = 16, Ωo = 2π/ 16= π/8  K=-7 to 8  Equation and comparison | | | (1)  (1)  (3) |
|  | b) | Steps | | | (4)  (1) |
|  | c) | Equation  Steps  Magnitude and Phase Spectra | | | (1)  (2)  (1)  (1) |
| **PART C** | | | | | |
| ***Answer any two full questions,each carries 20 marks.*** | | | | | |
| 7 | a) | (i) Equation  Steps  Answer,  Zeros at s = -5/2 and poles at s = -2 and s = -3 ,Plot S plane  (ii) Equation and steps  Poles at and Plot S plane | | | (1)  (1)  (1)  (2)  (2.5)  (1)  (1.5) |
|  | b) | Appling z domain Differentiation property    Next  Applying Time reversal property  =  Applying Convolution Property | | | (2)  (2)  (1)  (2)  (1)  (1)  (1) |
| 8 | a) | Steps | | | (4)  (1) |
|  | b) | Steps  Not stable | | | (3)  (1)  (1) |
|  | c) | Properties (each point carrying 2 marks) | | | (10) |
| 9 | a) | (i) Linearity  (ii)Time shifting  (iii)Convolution | | | (2)  (3)  (5) |
|  | b) | Steps | | | (4)  (1) |
|  | c) | Steps(Partial Fraction)  A=1; B=2; C= -2 | | | (4)  (1) |
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