



G1080

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## APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

### Scheme for Valuation/Answer Key

*Scheme of evaluation (marks in brackets) and answers of problems/key*

**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION (S), MAY 2019**

**Course Code: EE407**

**Course Name: DIGITAL SIGNAL PROCESSING**

Max. Marks: 100

Duration: 3 Hours

#### PART A

*Answer all questions, each carries 5 marks.*

		Marks
1	Need of zero padding -2 marks $y(n) = \{-1, -4, -7, -6\}$ – 3 marks	(5)
2	Linear phase realization (1 mark), equation (2 mark), Realization structure (2 mark)	(5)
3	Conversion equation- 1 marks Partial fraction of H(s)-1 marks Substitution and final equation-3 marks	(5)
4	Window function-1 marks, comparison based on main lobe width, side lobe height, attenuation etc-4 marks	(5)
5	Sign magnitude -1 marks, 1's complement-2 marks, 2's complement-2 marks	(5)
6	Definition-3 marks Description -2 marks	(5)
7	Name of buses- 3 marks functions-2 marks	(5)
8	One mark each	(5)

#### PART B

*Answer any two full questions, each carries 9 marks.*

9	8 point FFT butterfly diagram (5 marks), Steps (3 marks), Final answer (2 marks)	(10)
10	a) $y(n) = \{2, 5, 7, -1, -8, -7, 7, 17, 13, 1, -6\}$ Overlap save method – 3 marks, convolution of each blocks – 1 marks , final result - 1mark	(5)
	b) Obtain transfer function (1 mark) , Realization with structure (4 marks)	(5)
11	Parallel realization with structure (Block diagram/signal flow graph)-5 marks Cascade realization with structure (Block diagram/signal flow graph)-5 marks	(10)

#### PART C

*Answer any two full questions, each carries 9 marks.*

- 12 Pre-warping- 1marks, Find order and cut off frequency-3 marks, Calculation of H(s)-2 (10)  
marks, Transformation equation-1 marks, Substitution and final answer- 3 marks

$$H(z) = \frac{0.2332(1+z^{-1})^2}{1+0.4394z^{-1}+0.3845z^{-2}+0.0416z^{-3}}$$

- 13 a) Transfer function H(s)-2 marks, Transformation equation-1 marks, Calculation of (6)  
H(z)-3 marks  
b) Four points, one mark each (4)
- 14 Steps -5 marks, windowing-3 marks, Final answer -2 marks (10)

**PART D**

*Answer any two full questions, each carries 12 marks.*

- 15 a) product quantization noise model- 5marks (5)  
b) Equation -2 marks, output noise power- 3marks (5)
- 16 a) Table formulation- 3 marks (5)  
Limit cycle -2 marks  
b) TREG- 2.5 marks, PREG- 2.5 marks (5)
- 17 Block digram-7 marks (10)  
Explantion-3 marks

