Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII(NEW) EXAMINATION – SUMMER 2019

Subject Code: 2172409 **Date: 27/05/2019**

Subject Name: Digital Signal Processing for Power Electronics

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Define and classify signals.	**03**
	(b)	Explain the requirement of Fourier transformation.	**04**
	(c)	Describe round-off effect in digital filters. Explain the concept of limit cycle oscillations.	**07**
Q.2	**(a)**	What is FFT? List the applications of FFT.	**03**
	(b)	Explain Modified Harvard Architecture of DSP.	**04**
	(c)	Explain the concept of pipelining in DSP using an example.	**07**
		OR	
	(c)	What is MAC in DSP? Describe its features and advantages in DSP.	**07**
Q.3	**(a)**	What is ROC? List its properties.	**03**
	(b)	List the properties of DTFT.	**04**
	(c)	Derive and explain the relationship between Z transform and DFT transform.	**07**
		OR	
Q.3	**(a)**	What do you understand by frequency domain sampling?	**03**
	(b)	Compare DTFT and DFT.	**04**
	(c)	Derive and explain the relationship between Z transform and Fourier transform.	**07**
Q.4	**(a)**	What is FFT? What are its types?	**03**
	(b)	Explain sampling process and reconstruction of signal.	**04**
	(c)	Explain Radix-2 FFT algorithm with a suitable example.	**07**
		OR	
Q.4	**(a)**	Explain quantization effects in computation of DFT.	**03**
	(b)	Differentiate FFT from DFT. Which one is more efficient and why?	**04**
	(c)	Explain DIT FFT algorithm with a suitable example.	**07**
Q.5	**(a)**	Explain the need of Z transform in Power Electronics applications with reference to DSP.	**03**
	(b)	Explain the interconnection of LTI systems in brief.	**04**
	(c)	Discuss cascade realization of FIR system in detail.	**07**
		OR	
Q.5	**(a)**	List the applications of DSP in Power Electronics.	**03**
	(b)	Sketch the signal represented by $x1(t) = \delta\cos(t)$	**04**
	(c)	Define: 1) ROC 2) Convolution 3) LTI system 4) Periodicity 5) Aliasing 6) State Space 7) Correlation	**07**

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