SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E – EEE
Title of the paper: Digital Signal Processing & ITS Application
Semester: V Max.Marks: 80
Sub.Code: 514502 Time: 3 Hours
Date: 27-04-2009 Session: AN

PART – A (10 x 2 = 20)

Answer All the Questions

1. What is linear phase response of a filter?
2. Give any two properties of Butterworth low pass filter.
3. What is meant by bilinear transformation method of designing IIR filter?
4. What are the advantages of FIR filter over IIR filter?
5. What is quantization error?
6. Draw the direct form realization of FIR system.
7. What is wait – state generator in TMS320F2407 processor?
8. Write the different names of memory available in TMS320F2407 processor.
9. Write the main application areas of speech coding.
10. What is autocorrelation?

PART – B (5 x 12 = 60)

Answer All the Questions

11. For the given analog transfer function determine H(z) using impulse invariance and bilinear transformation methods. Assume T = 1ms.

$$H(S) = \frac{2}{(S+1)(S+2}$$

(or)

12. Design butterworth filter satisfying the constraints

$$0.707 \le |H(e^{jw})| \le 1 \quad \text{for } 0 \le w \le \Pi/2$$

$$|H(e^{jw})| \le 0.2 \quad \text{for } 3\Pi/4 \le w \le \Pi$$

With T = 1 second using impulse invariance method.

13. Design FIR filter using Hamming window with N = 7 for the ideal frequency response

$$H_d(e^{j\omega}) = e^{-j3\omega}; \; -\frac{\Pi}{8} \le \omega \le \frac{\Pi}{8}$$

$$= 0 \quad ; \; \frac{\Pi}{8} \le |\omega| \le \Pi$$

(or)

14. What are the desirable characteristics of the window? Explain design procedures FIR filter using rectangular and hanning windows.

15. (a) With examples, discuss the fixed point representation of number.
(b) Discuss the problems associated with realization of IIR system.

(or)

16. With respect to finite word length effects in digital filters, discuss about
(a) Over flow limit cycle oscillation
(b) Scaling.

17. Explain the architecture of TMS320F2407 Processor with block diagram.

(or)

18. Explain the following with respect to TMS 320 family processor.
(a) Features
(b) Pipelining operation
(c) Addressing modes

19. Discuss the role DSP in pulse generation in detail.

(or)

20. Explain how DSP can be used in speed control of DC motor.