

**R7**

Code: R7411908

B.Tech IV Year I Semester (R07) Supplementary Examinations, May 2013

**DSP PROCESSORS AND ARCHITECTURES**

(Electronics and Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions  
All questions carry equal marks

\*\*\*\*\*

- 1 (a) What are the advantages and disadvantages of programmable DSP processors?  
(b) Explain with a block diagram a basic DSP system and what the issues to be considered in designing a DSP system.
- 2 (a) Define the terms:  
(i) Dynamic range.  
(ii) Precision.  
(iii) Fixed point format.  
(iv) Floating point format.  
(b) Compare the dynamic range and percentage resolution of a signal that uses:  
(i) 16-point fixed point format.  
(ii) 32-point floating point format with 14 bit for the mantissa and 8-bit for the exponent.
- 3 Explain the functionality of MAC unit. Explain how overflow/underflow conditions can be avoided in MAC operations using:  
(a) Shifters.  
(b) Guard bits.  
(c) Saturation logic.
- 4 (a) What are various types of interrupts? Explain giving an example of each.  
(b) With various stages in pipeline structure, explain the concept of pipelining. How pipeline operations will improve the speed of execution?
- 5 (a) What are the architectural features of 54XX processor? Explain with a block diagram.  
(b) What are various interrupts of 54XX DSP?
- 6 (a) Explain the implementation procedure of FIR and IIR filters.  
(b) Explain the implementation procedure of decimation and interpolation.
- 7 (a) Explain the procedure to generate bit-reversed index for 4-bit and show the result for all possible combinations.  
(b) Draw the butterfly diagram for 2, 4, and 8 points using DITFFT.
- 8 Write notes on:  
(a) MCBSPS.  
(b) DMA.

\*\*\*\*\*