JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December 2018

Ph.D. I Semester

COURSE CODE: 14P1WCI231                                    MAX. MARKS: 35

COURSE NAME: MODELING ANALYSIS AND OPTIMIZATION OF NOC

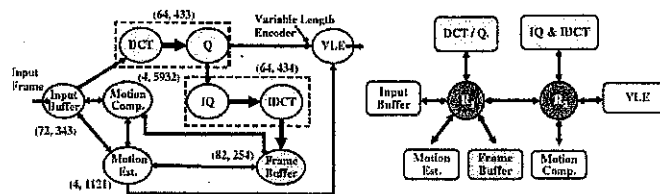COMMUNICATION

COURSE CREDITS: 03                                         MAX. TIME: 2Hr

*Note: All questions are compulsory. Each question carries equal marks. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. The data flow graph of the MPEG-2 encoder with its NoC-based implementation is shown below.



   i.   Design the System Model and Basic Assumptions
   ii.  Draw the Traffic Source Model with Experimental Justification for the ON/OFF Traffic Model

2. Explain the State Space Modeling of 4-port router, shown below:
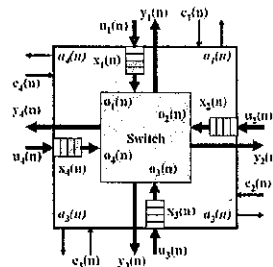


   How will you justify the Router stability with above sated model?

3. (a) Assume that a time $n_0$, the depth of the input buffers, their occupancies and the availability values received from the neighboring routers are given as follows:

$$B = \begin{matrix} Local \\ North \\ West \\ South \\ East \end{matrix} \begin{bmatrix} 4 \\ 4 \\ 4 \\ 4 \\ 4 \end{bmatrix}, X(n_0) = \begin{bmatrix} 0 \\ 4 \\ 0 \\ 0 \\ 0 \end{bmatrix}, C(n_0) = \begin{bmatrix} 0 \\ 8 \\ 3 \\ 8 \\ 8 \end{bmatrix}$$

Calculate the availabilities in matrix notation

(b) Comment on Stability of the Flow Control Algorithm shown below:
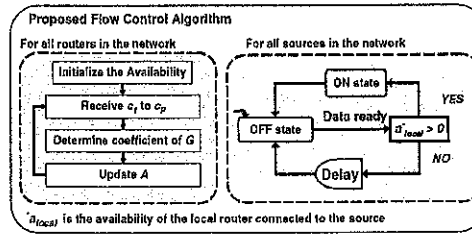


4. (a) What is VFI Partitioning in Networks-on-Chip? How VFIs is rely on a GALS communication paradigm?

(b) Explain the Outline of shown VFI partitioning and static voltage assignment methodology
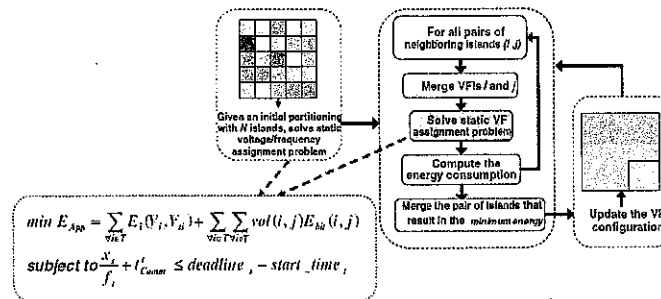


5. Explain the Feedback Control of Voltage and Frequency for a network with 2 VFIs and 2 interface queues