

FACULTY OF ENGINEERING & TECHNOLOGY
M.E.(CSE/SE) Examination – DEC – 2014
Computer Network Protocol Design (Revised)

[Time: Three Hours]

[Max. Marks: 80]

“Please check whether you have got the right question paper.”

- N.B**
- 1) Solve any two questions from each section.
 - 2) Assume suitable data wherever required.
 - 3) Use of calculator is allowed.
 - 4) Be specific to every answer.

SECTION A

- Q.1 A) Write kindle’s notation for following queries. 08
i) $M^m|M|B$ ii) $M^m|m^m|J|B$ iii) $M|M|I$ iv) $M|M|I|B$
Also write example of each.
- B) Draw the state transition diagram for discrete time $M|M|I$ queue also write the transition matrix. 08
- C) Write any four properties of Markova matrix. 04
- Q.2 A) What is reducible Markov chain? Explain closed and transient state and transition matrix of reducible Markov chain. 08
- B) Probability density function is used to predict the life computer node in hours in a computer network is given by 08
- $$f(x) = \begin{cases} \frac{100}{x^2} & \text{for } x \geq 100 \\ 0 & \text{for } x < 100 \end{cases}$$
- Find i) the distribution function ii) Find probability that a node will last for 150 hours.
- C) What is hold time in Markov chain? How it is decided in discrete time Markov chain and continuous time Markov chain? 04
- Q.3 A) Find Eigen value λ and vector v such that $AV = \lambda V$ where 08
- $$A = \begin{bmatrix} 3/2 & 1/2 \\ 1/2 & 3/2 \end{bmatrix}$$
- B) Model the $M^m|M|I|B$ queue also write transition matrix of the same 08
- C) What is ergodic process & stationary process describe in brief. 04

SECTION B

- Q.4 A) Describe max-min fairness scheduling algorithm. 08
- B) Assume an outgoing line is being shared among 5 channels. The system parameters (in units of mbps) are as follows. 08
- $C = 155$
 $\lambda_1 = 10$
 $\lambda_2 = 20$
 $\lambda_3 = 60$
 $\lambda_4 = 80$
 $\lambda_5 = 80$
- Find the rate assigned to each flow according to max min algorithm.
- C) What is difference between weighted round robin and Round robin scheduler? 04
- Q.5 A) Derive average duration of the active period, silent period and average data rate of on off model. 08
- B) What is Markov modulated poisson process? Also explain auto regressive models in computer network traffic. 08
- C) What is flow traffic model? Also explain modulated Poission’s process in brief. 04
- Q.6 A) Model the token Bucket algorithm 08
- B) Model the Go back N ARQ protocol. 08
- C) Describe in brief stop and wait ARQ protocol working 04