

SUBJECT CODE:- 8220
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E.(CSE/Software) Examination Nov/Dec 2015
Computer Network proto. Design. EL-1 (Soft)
(Revised)

[Time: Three Hours]

[Max. Marks: 80]

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

- N.B i) write any two questions from each section
 ii) Please be specific to every answer.

Section A

- Q.1 a) What is random process? Explain cumulative distribution function (cdf) & probability distribution function. 10
 b) What is physical significance of ensemble average, time average, autocorrelation function in random process analysis? 10
- Q.2 a) Explain memory less property of Markov chains. Consider a data buffer in certain a certain communication device such as a network router. Assume the buffer could accommodate at most four packets. Identify the states of this buffer and show the possible transition assume that at any time step at most one packet can arrive or leave. 10
 b) In an Ethernet network based on the carrier sense multiple access with collision detection (CSMA/CD) a user requesting access to the network starts transmission when the channel is not busy. If the channel is not busy, the user starts transmitting. However if one or more users sense that the channel is free, they will start transmitting and a collision will take place. If a collision from other users is detected, the user stops transmitting and returns to the idle condition 10
 Assume the following probabilities u_0 probability all users are idle u_1 probability only one user is transmitting $1-u_0-u_1$ probability two or more users are transmitting, justify using Markov chain analysis, draw the state transition diagram.
- Q.3 a) What is reducible Markov chain? Explain closed & transient states. 10
 b) Why it is necessary to study queuing analysis? Explain following terms in queuing analysis 10
 i) Queue throughput
 ii) Efficiency (η)
 iii) Traffic conservation
 iv) Little's law

SECTION-B

- Q.4 a) Model the leaky Bucket Algorithm for single arrival/single departure. 10
 b) Derive the performance of token Bucket algorithm for $(M|M|1|B)$ 10
- Q.5 a) What are flow traffic models explain modulated poisson processes & on-off model? 10
 b) Explain memory less property of poisson traffic 10
- Q.6 a) Explain various scheduler design issues & what are various scheduler performance measures 10
 b) Model the queuing analysis of WRR 10