

[Total No. of Printed Pages:1]

**CODE NO:- Z-8064**

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**M.E (CSE/SE) Examination - June – 2015**

**Computer Network Protocol Design**

**(Revised)**

[Time: Three Hours]

[Max. Marks: 80]

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

**N.B**

- i) Solve any two questions from each section.
- ii) Assume suitable data, wherever required.
- iii) Be specific to every answer.

**SECTION-A**

- Q.1 a) Write physical significance of probability density function. Also explain where probability density function is being used. 08
- b) Derive co-variance function and cross correlation function for discrete random variables. 08
- c) Difference between deterministic and non deterministic processes. 04
- Q.2 a) Assume an on-off data source that generates equal length packets with probability ‘a’ per time step. The channel introduces error in the transmitted packets, such that the probability of a packet is in error is ‘e’ model. The source using markov chain analysis. Draw the markov chain state transition diagram & write state transition matrix. 08
- b) What are reducible markov chains? Also explain closed and transient state. 08
- c) Write short note on periodic markov chains. 04
- Q.3 a) Why it is necessary to understand queuing analysis in computer networks? Explain queue characteristics i) Arrival pattern ii) Service pattern iii) Service arrangement. 08
- b) Derive following performance parameters for M/M/I/ B queue 08
- i) Average number of packets in the system ( $L_s$ ) ii) Average waiting time( $w_q$ )
- c) Explain the meaning of the following notations. 04
- i) M/M/J/B ii)  $M^m/M/I/B$

**SECTION –B**

- Q.4 a) Model the leaky bucket algorithm. 08
- b) Derive the model of Bo Back in protocol. 08
- c) Explain stop and wait protocol. 04
- Q.5 a) Explain memory less property of Poisson traffic. 08
- b) What is modulated Poisson’s process also explain auto regressive model. 08
- c) Short note on Bernoulli traffic. 04
- Q.6 a) Derive an expression for queuing analysis of round robin scheduler of packet dispatching. 08
- b) What are various scheduler design issues? 08
- c) What is packet drop policy & how it is used. 04