Informal Quiz 3

❏ ❏ Forwarding works in the control plane whereas routing works in the data plane

❏ ❏ A routing protocol summarizes global information to setup a local next-hop entry in the forwarding table

❏ ❏ Telephony uses simple alternate path routing partly because the core is fully connected and components are extremely reliable

❏ ❏ The Bellman-Ford algorithm/distance-vector protocol involves checking neighbors' distance vectors and updating its own distance vector.

❏ ❏ The link state method does not face the count-to-infinity problem because it has complete global information (a map in terms of link-states).

❏ ❏ Both the distance-vector and link-state approaches could lead to transient routing loops because the information maintained could be incomplete.

❏ ❏ Hierarchical addressing, and proper address assignment allows entire subnets to be viewed by interior routers as "virtual nodes", leading to routing scalability

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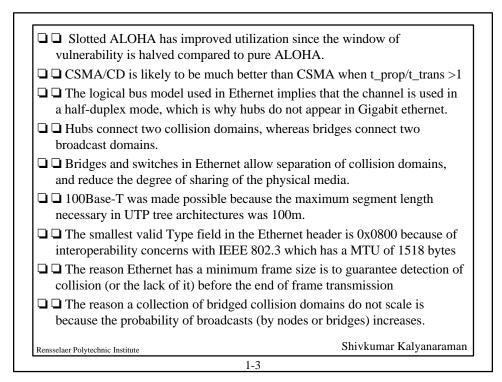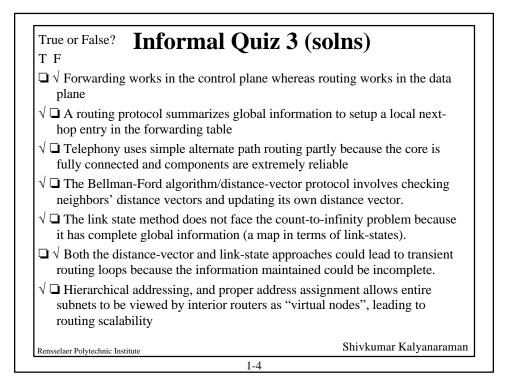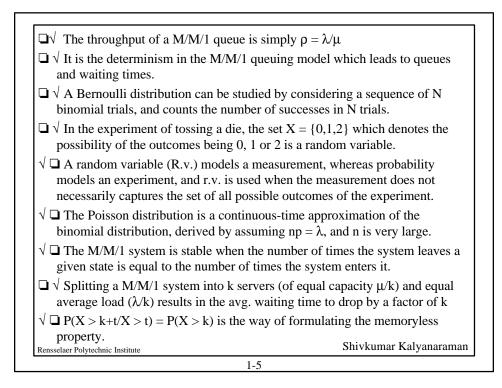❏ ❏ The throughput of a M/M/1 queue is simply $\rho = \lambda/\mu$

❏ ❏ It is the determinism in the M/M/1 queuing model which leads to queues and waiting times.

❏ ❏ A Bernoulli distribution can be studied by considering a sequence of N binomial trials, and counts the number of successes in N trials.

❏ ❏ In the experiment of tossing a die, the set $X = \{0,1,2\}$ which denotes the possibility of the outcomes being 0, 1 or 2 is a random variable.

❏ ❏ A random variable (R.v.) models a measurement, whereas probability models an experiment, and r.v. is used when the measurement does not necessarily captures the set of all possible outcomes of the experiment.

❏ ❏ The Poisson distribution is a continuous-time approximation of the binomial distribution, derived by assuming $np = \lambda$, and n is very large.

❏ ❏ The M/M/1 system is stable when the number of times the system leaves a given state is equal to the number of times the system enters it.

❏ ❏ Splitting a M/M/1 system into k servers (of equal capacity μ/k) and equal average load (λ/k) results in the avg. waiting time to drop by a factor of k

❏ ❏ $P(X > k+t/X > t) = P(X > k)$ is the way of formulating the memoryless property.

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❑ ❑ Slotted ALOHA has improved utilization since the window of vulnerability is halved compared to pure ALOHA.

❑ ❑ CSMA/CD is likely to be much better than CSMA when t_prop/t_trans >1

❑ ❑ The logical bus model used in Ethernet implies that the channel is used in a half-duplex mode, which is why hubs do not appear in Gigabit ethernet.

❑ ❑ Hubs connect two collision domains, whereas bridges connect two broadcast domains.

❑ ❑ Bridges and switches in Ethernet allow separation of collision domains, and reduce the degree of sharing of the physical media.

❑ ❑ 100Base-T was made possible because the maximum segment length necessary in UTP tree architectures was 100m.

❑ ❑ The smallest valid Type field in the Ethernet header is 0x0800 because of interoperability concerns with IEEE 802.3 which has a MTU of 1518 bytes

❑ ❑ The reason Ethernet has a minimum frame size is to guarantee detection of collision (or the lack of it) before the end of frame transmission

❑ ❑ The reason a collection of bridged collision domains do not scale is because the probability of broadcasts (by nodes or bridges) increases.

True or False?   # Informal Quiz 3 (solns)

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