QUIZ 15 VIII QUEUEING THEORY

Roll No.	Marks

1. (M/M/1) : (∞/FIFO) model, the probability that the waiting time exceeds some ω =

(a) $\rho e^{-(\mu-\lambda)\omega}$ (b) $\int_{\omega}^{\infty}(\mu-\lambda)e^{-(\mu-\lambda)\omega}$ (c) $\frac{\rho}{(\mu-\lambda)}$ (d) $\frac{1}{(\mu-\lambda)}$ [ ]

2. (M/M/1) : (∞/FIFO) model, the probability that the waiting time is more than ω = $P(W \geq \omega)$

(a) $\rho e^{-(\mu-\lambda)\omega}$ (b) $\int_{\omega}^{\infty}(\mu-\lambda)e^{-(\mu-\lambda)\omega}$ (c) $\frac{\rho}{(\mu-\lambda)}$ (d) $\frac{1}{(\mu-\lambda)}$ [ ]

3. (M/M/1) : (∞/FIFO) model, the expected waiting time in the queue, not including the service time = W_q =

(a) $\rho e^{-(\mu-\lambda)\omega}$ (b) $\int_{\omega}^{\infty}(\mu-\lambda)e^{-(\mu-\lambda)\omega}$ (c) $\frac{\rho}{(\mu-\lambda)}$ (d) $\frac{1}{(\mu-\lambda)}$ [ ]

4. (M/M/1) : (∞/FIFO) model, the expected waiting time in the system, including the service time = W_s =

(a) $\rho e^{-(\mu-\lambda)\omega}$ (b) $\int_{\omega}^{\infty}(\mu-\lambda)e^{-(\mu-\lambda)\omega}$ (c) $\frac{\rho}{(\mu-\lambda)}$ (d) $\frac{1}{(\mu-\lambda)}$ [ ]

In a T.V. repair shop, T.V. repair man spends 30 minutes on his job on an average. The arrival rate of T.V. sets is 10 per an eight hour day. Then

5. Traffic intensity per hour = ρ = ?
(a) 0.8 (b) 1.25 (c) 9 (d) 5 [ ]

6. The probability that there is no T.V. set in the system = ?
(a) 0.375 (b) 1.25 (c) 9 (d) 5 [ ]

In a self service canteen 8 customers arrive per every 10 minutes on an average. The cashier can serve 1 person per minute on an average. Then

7. Traffic intensity = ρ =
(a) 3.2 (b) 5 (c) 0.8 (d) 4 [ ]

8. Average queue length = ?
(a) 3.2 (b) 5 (c) 0.8 (d) 4 [ ]

9. Average time that a customer spends in the system in minutes = ?
(a) 3.2 (b) 5 (c) 0.8 (d) 4 [ ]

10. Average time that a customer spends in the queue = ?
(a) 3.2 (b) 5 (c) 0.8 (d) 4 [ ]

Cars arrive at a toll gate with a mean frequency of 1.2 per minute. The service time is 20 seconds per car on an average. Then

11. Average number of cars in the system = L_s = ?
(a) 0.666 (b) 33.3 (c) 1 (d)13.33 [ ]

12. Average number of cars in the queue = L_q =?
(a) 0.666 (b) 33.3 (c) 1 (d)13.33 [ ]

13. Average waiting time in the system = W_s =? (in seconds)
(a) 0.666 (b) 33.3 (c) 1 (d)13.33 [ ]

14. Average waiting time in the queue = W_q = ? (in seconds)
(a) 0.666 (b) 33.3 (c) 1 (d)13.33 [ ]

15. In (M.M.1) **:** (N/FIFO) model, the average number of customers in the system = E(n) =
(a) $\sum_{n=0}^{N} nP_n$ (b) $P_n = \rho^n P_0$ (c) $\sum_{n=0}^{N} (n-1) P_n$ (d) $\frac{E(n)}{\lambda'}$ [ ]

16. In (M.M.1) **:** (N/FIFO) model, the queue length = E(m) = ?
(a) $\sum_{n=0}^{N} nP_n$ (b) $P_n = \rho^n P_0$ (c) $\sum_{n=0}^{N} (n-1) P_n$ (d) $\frac{E(n)}{\lambda'}$ [ ]

17. In (M.M.1) **:** (N/FIFO) model, the average waiting time in the system = W_s = ?
E(n) =
(a) $\sum_{n=0}^{N} nP_n$ (b) $P_n = \rho^n P_0$ (c) $\sum_{n=0}^{N} (n-1) P_n$ (d) $\frac{E(n)}{\lambda'}$ [ ]

Suppose the mean arrival rate is 3 in a single service queuing system. If the service time is 0.25 hours, then

18. Traffic intensity = ρ = ?
(a) 2 (b) 1.33 (c) 0.75 (d) $\frac{30}{37}$ [ ]

19. The expected number of customers in the system = ?
(a) 2 (b) 1.33 (c) 0.75 (d) $\frac{30}{37}$ [ ]

20. λ' =?
(a) $\lambda(1-P_N)$ (b) $\frac{\lambda}{(1-P_N)}$ (c) $\lambda(1-\rho_N)$ (d) $\frac{\lambda}{(1-\rho_N)}$ [ ]