Chettinad College of Engineering & Technology
Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

Department of Computer Science and Engineering

MA8402 - Probability and Queueing Theory

Unit III - MCQ Bank

UNIT – III – RANDOM PROCESS

1.A random process is called Deterministic if ----------

A. all the future values can be predicted from the past observations

B. random variable

C. dependent

D. Ergodic process

Answer: (A)

2. Poisson process is a --------- random process.

A. Discrete

B. Ergodic

C. Non – negative values

D. Stationary

Answer: (A)

3. The TPM of a finite state Markov chain takes only----------

A. Discrete

B. Ergodic

C. Non – negative values

D. Stationary

Answer: (C)

4. A random process with time averages equal to ensemble averages is called as ----------.

A. Discrete

B. Ergodic

C. Non – negative values

D. Stationary

Answer: (B)

5. The random process is a random variable which is ---------- on time

A. Discrete

B. random variable

C. dependent

D. Ergodic process

Answer: (C)

6. The random process at a particular time instant is a ----------

A. Discrete

B. random variable

C. dependent

D. Ergodic process

Answer: (B)

7. A true SSS process ranges from ----- to ------

A. (-1,1)

B. (-2,2)

C. (-x,x)

D. ($-\infty, \infty$)

Answer: (D)

8. Every ergodic process is ---------- process

A. Discrete

B. Ergodic

C. Non – negative values

D. Stationary

Answer: (D)

9. Is it a valid $\begin{pmatrix} 0.2 & 0.8 \\ 0.1 & 0.5 \end{pmatrix}$ TPM?

A. Yes

B. No

Answer: (B)

10. Find the mean and variance of the process given that the ACF $R_{XX}(\tau) = 25 + \frac{4}{1+6\tau^2}$

A. Mean = 4, Variance = 5

B. Mean = 7, Variance = 6

C. Mean = 8, Variance = 9

D. Mean = 5, Variance = 4

Answer: (D)

11. Find the mean of the stationary process {X(t)} whose autocorrelation function $R(\tau) = + \frac{25\tau^2+36}{6.25\tau^2+4}$

A. Mean = 2

B. Mean = 7

C. Mean = 8

D. Mean = 5

Answer: (A)

12. If the random process is periodic, then its ACF is ----------.

A. Discrete

B. Periodic

C. dependent

D. Ergodic process

Answer: (B)

13. If two independent random process are of zero mean, then their correlation is ------

A. one

B. infinite

C. dependent

D. zero

Answer: (D)

14. Two independent random process will have their cross correlation as ----- of individual means.

A. product

B. infinite

C. dependent

D. zero

Answer: (A)

15. The auto correlation of a random process $R(\tau)$ at $\tau = 0$ is equal to its -------

A. product

B. infinite

C. dependent

D. Second moment

Answer: (D)

16. $\{x_t\ t \in T\}$ is a stochastic process. If the joint distribution of $X_{t1}, X_{t2} \ldots X_{tn}$ and X_{t1+h} , $X_{t2+h} \ldots X_{tn+h}$ is same for all h>0; then X(t) is

A. Weak stationary process

B. Strong stationary process

C. Process with independent increments.

D. Markov process

Answer: (A)

17. Which of the following is NOT CORRECT

a) An absorbing state is recurrent.

b) An ergodic state is recurrent.

c) Recurrent state is periodic.

d) An absorbing state is aperiodic.

Answer: (D)

18.For a Markov chain X_n with state space S, $p_{ij}=P[X_{n+1}=j/X_n=i]]$ for all $i,j \in S$, then

a) p_{ij} are called n step transition probabilities.

b) p_{ij} are called (j-i) step transition probabilities.

c) p_ij are called transition probabilities of order n

d) p_{ij} are called one- step transition probabilities from state i to state j.

Answer: (D)

19. If arrivals are according to Poisson process then distribution of inter arrival times is,

a) Gamma.

b) Chi-square.

c) Exponential.

d) Normal.

Answer: (C)

20. If $\{N_1(t)\}$ and $\{N_2(t)\}$ are two independent Poisson processes with rates λ_1 and λ_2 respectively then $N_1(t) – N_2(t)$ is a…

a) Poisson process with rate $\lambda_1 + \lambda_2$.

b) Poisson process with rate $\lambda_1 - \lambda_2$.

c) Poisson process with rate λ_1 / λ_2

d) Not a Poisson process.

Answer: (D)

21. The component of time series attached to long term variation is generally termed as, …

a) Cyclic variation.

b) Irregular variation.

c) Seasonal variation.

d) Trend.

Answer: (A)

22. The sales of departmental store on Dushera and Diwali is associated with the … component of a time series.

a) Trend.

b) Seasonal variation.

c) Irregular variation.

d) Cyclic variation.

Answer: (B)

23. Auto regressive process of order one can always be expressed as…

a) Infinite order moving average process.

b) Moving average of order one.

c) Auto regressive process of order p.

d) Moving average of order q.

Answer: (C)

24. Autocorrelation of lag zero of any process is equal to…

a) Variance of process.

b) One.

c) Zero.

d) Depends on process.

Answer: (A)

25. Which of the following statement about relation between strict and weak stationary process is true?

a) A strict stationary process with finite process is also weak stationary process.

b) A weak stationary process is always strict stationary process.

c) There is no relation between strict and weak stationary processes.

d) A weak stationary process following gamma distribution is strict stationary process.

Answer: (A)