

2 MARKS QUESTIONS

1. A random variable X has the following probability mass function.

X = xi	0	1	2	3	4	5	6	7	8
P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a

Find the value of a.

- (a) 1/80
- (b) 1/81
- (c) 1/83
- (d) 1/79

Ans: (b), CO3, L2

2. Let X be a random variable with PDF given by

$$f(x) = \begin{cases} cx^2 & |x| \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Find c.

- (a) 3/2
- (b) 2/3
- (c) 1/4
- (d) 5/6

Ans: (a), CO3, L2

3. An agent sells life insurance policies to five equally aged, healthy people. According to recent data, the probability of a person living in these conditions for 45 years or more is 2/3. Calculate the probability that after 45 years that at least three people are still living.

- (a) 0.164
- (b) 0.35
- (c) 0.791
- (d) 0.56

Ans: (c), CO3, L2

4. In a particular time duration, one telephone line in every five is engaged in a conversation: what is the probability that when 10 telephone numbers are chosen at random, only two are in use?

- (a) 0.5367
- (b) 0.2351
- (c) 0.156
- (d) 0.3020

Ans: (d), CO3, L3

5. 3 students come to attend the class on an average, find the probability for exactly 4 students to attend the classes on the following day.
- (a) 0.1890
 - (b) 0.1680
 - (c) 0.1957
 - (d) 0.325

Ans: (b), CO3, L2

6. The life of compressor manufactured by a company is known to be 200 months on an average following an exponential distribution. Find the probability that the life of a compressor of that company is between 100 months and 25 years.
- (a) 0.3834
 - (b) 0.35
 - (c) 0.5
 - (d) 0.568

Ans: (a), CO3, L3

7. Find z_1 , if $P(z < z_1) = .35$
- (a) -0.39
 - (b) 0.39
 - (c) -0.9
 - (d) 0.9

Ans: (a), CO3, L2

8. If $\int_{c_1} f(z) dz = \int_{c_2} f(z) dz$ then
- (a) $f(z)$ is analytic on C_1 and C_2
 - (b) $f(z)$ is analytic on C_1
 - (c) $f(z)$ is analytic on C_1, C_2 and in the region bounded by C_1, C_2
 - (d) $f(z)$ is not analytic on C_1, C_2 and in the region bounded by C_1, C_2

Ans: (c), CO2, L1

9. To fit a normal distribution, the parameters required are
- (a) Mean
 - (b) Standard deviation
 - (c) Mean, variance and Standard deviation
 - (d) Mean and Standard deviation

Ans: (d), CO3, L1

10. $\int_c \frac{f(z)}{(z-a)^{n+1}} dz$ is

- (a) $\frac{2\pi i}{n!} f^{n+1}(a)$
- (b) $\frac{2\pi i}{n!} f^{n-1}(a)$
- (c) $\frac{2\pi i}{(n+1)!} f^n(a)$
- (d) $\frac{2\pi i}{n!} f^n(a)$

Ans: (d), CO2, L1

3 MARKS QUESTIONS

11. A travel agency has 2 cars which it hires daily. The number of demands for a car on each day is distributed as a Poisson variate with mean 1.5. Find the probability that on a particular day a demand is refused.

- (a) 0.2235
- (b) 0.1912
- (c) 0.1587
- (d) 0.356

Ans: (b), CO3, L3

12. In a Poisson distribution if $2P(x=1) = P(x=2)$, then the variance is

- (a) 0
- (b) -1
- (c) 4
- (d) 2

Ans: (c), CO3, L2

13. Find the binomial distribution function for $x = 5$ which has mean 2 and variance $4/3$

- (a) $\binom{6}{r} p^r q^{6-r}$
- (b) $\binom{5}{r} (1/3)^r (2/3)^{5-r}$
- (c) $\binom{6}{r} (1/3)^r (2/3)^{6-r}$
- (d) $\binom{5}{r} \left(\frac{1}{2}\right)^r \left(\frac{1}{2}\right)^{5-r}$

Ans: (c), CO3, L2

14. If x is exponential variate with mean 6, evaluate $P(-\infty < x < 10)$

- (a) 0.236
- (b) 0.75
- (c) 0.99
- (d) 0.8111

Ans: (d), CO3, L3

15. The mean weight of 500 students during a medical examination was found to be 50 kgs and S.D. weight 6kgs. Assuming that the weights are normally distributed. Find the number of students having weight between 40 and 50 kgs.

- (a) 215
- (b) 226
- (c) 156
- (d) 280

Ans: (b), CO3, L3

16. Find the value of z such that area to the right of x is .24

- (a) 0.356
- (b) 0.71
- (c) -0.71
- (d) 0.568

Ans: (b), CO3, L3

17. Find mean for the following probability density function

$$f(x) = \begin{cases} xe^{-x} & 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$$

- (a) $2 - \frac{5}{2e}$
- (b) $6 - \frac{5}{2e}$
- (c) $2 + \frac{5}{e}$
- (d) $2 - \frac{5}{e}$

Ans: (d), CO3, L3

18. Find the variance for the following distribution

x	10	20	30	40
p(x)	1/8	3/8	3/8	1/8

- (a) 74.1
- (b) 75
- (c) 76
- (d) 70.69

Ans: (b), CO3, L2

19. Evaluate $\int_C \frac{1}{z^2 - \pi^2} dz$ where C: $|z-1|=3$.

- (a) $\frac{i}{\pi}$
- (b) $\frac{i}{2\pi}$

- (c) i
- (d) 2π

Ans: (c), CO2, L3

20. Evaluate $\int_C \frac{e^{2z}}{(z-2)(z+1)} dz$ where $C: |z|=1.5$.

- (a) πe^2
- (b) $2\pi e$
- (c) $2\pi e/19$
- (d) $-2\pi i/3e^2$

Ans: (d), CO2, L3