CUET Mathematics Test

Chapter: Unit IV: Probability Distributions

General Instructions

1. Total Questions: **20**

2. Duration: **60 Minutes**

3. All questions are compulsory.

4. Each question carries **5 marks**.

5. For each correct answer: **+5 marks**.

6. For each incorrect answer: **-1 mark**.

7. No negative marking for unanswered questions.

8. Use of calculator or electronic devices is strictly prohibited.

9. Choose the most appropriate answer from the given options.

---

1. A random variable X has the following probability distribution: $P(X = x) = kx$ for $x = 1, 2, 3$ and $P(X = x) = k(x - 2)$ for $x = 4, 5$. The value of k is:
   (A) 1/12
   (B) 1/10
   (C) 1/9
   (D) 1/15

2. For a random variable X, $E(X) = 3$ and $E(X^2) = 13$. The standard deviation of X is:
   (A) 4
   (B) 2
   (C) 10
   (D) $\sqrt{10}$

3. A coin is tossed 6 times. The probability of getting at least 5 heads is:
   (A) 7/64
   (B) 3/32
   (C) 1/64
   (D) 5/64

4. In a Binomial distribution, the mean is 4 and the variance is 3. The number of trials n is:
   (A) 12
   (B) 16
   (C) 20
   (D) 24

5. If X follows a Poisson distribution such that $P(X = 1) = P(X = 2)$, then $P(X = 0)$ is:
   (A) e^{-1}
   (B) e^{-2}
   (C) 1/2
   (D) $e^{-0.5}$

6. The probability that a bulb produced by a factory will fuse after 150 days of use is 0.05. Out of 10 such bulbs, the probability that none will fuse is:
   (A) $(0.95)^{10}$
   (B) $(0.05)^{10}$
   (C) $1 - (0.95)^{10}$
   (D) $10(0.05)(0.95)^9$

7. For a Normal distribution, the relationship between Mean Deviation (MD) and Standard Deviation (σ) is approximately:
   (A) $MD = \frac{4}{5}\sigma$
   (B) $MD = \frac{2}{3}\sigma$
   (C) $MD = \sigma$
   (D) $MD = \frac{3}{4}\sigma$

8. In a Poisson distribution, if the mean is λ, then the variance is:
   (A) $\sqrt{\lambda}$
   (B) λ^2
   (C) λ
   (D) 2λ

9. A random variable X takes values 0, 1, 2 with probabilities 1/3 each. The mathematical expectation $E(X^2 + 1)$ is:
   (A) 5/3

(B) 8/3

(C) 2

(D) 7/3

10. If Z is a standard normal variable, the value of $P(Z > 0)$ is:
    (A) 1
    (B) 0
    (C) 0.5
    (D) 0.68

11. Eight coins are tossed simultaneously. The probability of getting at most 1 head is:
    (A) 9/256
    (B) 1/256
    (C) 8/256
    (D) 1/32

12. In a Poisson distribution, if $P(X = 0) = 0.2$, then the variance of the distribution is:
    (A) $\log_e 5$
    (B) $\log_e 0.2$
    (C) 0.8
    (D) 5

13. The mean and variance of a Binomial distribution are 10 and 5 respectively. The probability $P(X = 1)$ is:
    (A) $20 \times (1/2)^{20}$
    (B) $10 \times (1/2)^{10}$
    (C) $(1/2)^{20}$
    (D) $1/2$

14. A box contains 100 bolts, of which 10 are defective. If a sample of 5 bolts is drawn with replacement, the probability that at most one is defective is:
    (A) $(0.9)^5 + 5(0.1)(0.9)^4$
    (B) $(0.9)^5$
    (C) $1 - (0.9)^5$
    (D) $5(0.1)(0.9)^4$

15. The area under the standard normal curve between $Z = -1$ and $Z = 1$ is approximately:
    (A) 0.95
    (B) 0.68
    (C) 0.99
    (D) 0.50

16. If the expectation of a discrete random variable X is 5 and $Y = 2X + 3$, then $E(Y)$ is:
    (A) 10
    (B) 13
    (C) 8
    (D) 15

17. The number of road accidents at a high-way follow Poisson distribution with a mean of 2 per month. The probability of having exactly 3 accidents in a month is:
    (A) $\frac{4}{3e^2}$
    (B) $\frac{8}{3e^2}$
    (C) $\frac{4}{3}e^2$
    (D) $\frac{2}{3e^2}$

---

18. For a Normal distribution with mean 50 and SD 10, the Quartile Deviation is approximately:
    (A) 6.75
    (B) 10
    (C) 5
    (D) 8

19. If X is a Binomial random variable with $n = 10$ and $p = 1/2$, then the mode of the distribution is:
    (A) 5
    (B) 4 and 5
    (C) 5 and 6
    (D) 6

20. A random variable X has $E(X) = 2$ and $Var(X) = 4$. Then $E((2X + 1)^2)$ is:
    (A) 25
    (B) 33
    (C) 37
    (D) 41

Special Features

◆ **Board-Specific** – CBSE, ICSE, ISC, State Boards
◆ **Exam-Focused** – JEE, SAT, CAT, CTET, CUET, NTSE
◆ **Grade-Wise** – Class 6 to 12
◆ **Bilingual Options** – English & Hindi Medium Support
◆ **Printable & Shareable** – Use offline, anytime

How to Order:

Visit : https://www.mathstudy.in

Browse by Exam, Class, or Topic

Add to Cart & Checkout

Contact & Support:

✉ Email: admin@mathstudy.in

💬 WhatsApp Support Available : +91-+91 92118 65759

💡 Why Wait? Empower your learning journey, save time, and achieve your dreams!

🌐 Explore & Start Learning Today:
https://www.mathstudy.in – Premium eBooks for success
https://www.udgamwelfarefoundation.com – Free PDFs, practice tests, & guida

MathStudy.in — Empowering Learners, Enabling Educators, Encouraging Excellence.
Digital Learning | Affordable Excellence | Trusted by Thousands