

Mid-West University
Examinations Management Office
Surkhet, Nepal

End Semester Examination-2080

Level: B.Ed. / IV Semester

Sub: Probability with Stochastic for Teacher (MATH 343)

Roll No.

Group "A"

10 × 1 = 10

Tick (✓) the best answer.

1. Probability is defined as.....
 - a. numerical measure of certainty
 - b. numerical measure of an uncertainty
 - c. theoretical measure of certainty
 - d. all of the above.
2. A coin is tossed three times. What is the probability that heads occur exactly one time?
 - a. 0.125
 - b. 0.250
 - c. 0.333
 - d. 0.375
3. The sum of the probability of all elementary events of an experiment p is.....
 - a. $0 < p < 1$
 - b. $0 \leq p < 1$
 - c. $p = 1$
 - d. $p = 0$
4. A continuous random variable X has the probability density function $f(x) = 2x^2$ $0 \leq x \leq 1$...

0

otherwise

 - a. 0.25
 - b. 0.50
 - c. 0.75
 - d. 1
5. The conditional probability of the event A given B is ...
 - a. $P(A \cup B)$
 - b. $\frac{P(A)}{P(A \cap B)}$
 - c. $\frac{P(A \cap B)}{P(B)}$
 - d. $\frac{P(A \cap B)}{P(A)}$

6. An experiment whose outcomes has to be among a set of events that are completely known but whose exact outcomes is unknown is a
 - a. sample Space
 - b. elementary Event
 - c. random Experiment
 - d. none of the above
7. The game having the expectation $E(X)$ is equal to zero is said to be ...
 - a. Fair game
 - b. Favorable to the player
 - c. Unfavorable to player
 - d. not decided
8. The variance of a random variable X with mean $E(x) = M$ is given by
 - a. $E(x) - \mu^2$
 - b. $E(x^2) - \mu$
 - c. $(x^2) - \mu^2$
 - d. $E(X - \mu^2)$
9. Given that z is a standard normal variable. The value of $P(0.25 \leq z \leq 1.63)$ is.....
 - a. 0.3497
 - b. 0.3479
 - c. 0.4567
 - d. 0.4576
10. The standard normal variable Z is given by
 - a. $\frac{X - \mu}{\sigma}$
 - b. $\frac{\mu - X}{\sigma}$
 - c. $\frac{X - \mu}{\sigma}$
 - d. $\frac{\mu - X}{\sigma}$

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FM: 60

Time: 3.00 hrs.

PM: 30

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Candidates are required to give their answers in their own words as far as practicable.
Attempt all the questions.

Group "B"

6×5 = 30

1. State axioms of probability. Given that $P(A) = 3/8$, $P(B) = 5/8$, $P(A \cup B) = 3/4$ then find $P(B/A)$ and $P(A/B)$.
2. Define permutation and combination with example. If two coins are tossed, find the probability of getting
 - a. One head
 - b. at most one tail
 - c. exactly one head
3. Define conditional Probability. A fair die is rolled find the probability of getting even number?

Or

A bag contains 8 white balls and 5 blue balls. In how many ways can 5 white balls and 3 blue balls be drawn?
4. If 3% of the electric bulbs manufactured by a company are defective. Find the probability that in a sample of 100 bulbs (a) 0 (b) 2 bulbs will be defective.
5. Find the expected number of boys for the three child family (that is expected value of the number of boys).
6. The probability of a man hitting a target is $1/3$ if he fires 5 times, what is the probability of hitting the target
 - a. Exactly one time?
 - b. At least twice?

Or

Two coins are tossed. What is the probability of getting?

- i. Two heads?
- ii. At least one head?
- iii. At most one head?

Group "C"

2×10=20

7. Define the expected value of binomial distribution with mean, standard deviation and variance. If a sample of 3 items are selected from the box containing 12 items which 3 are defective. Find the expected number $E(X)$ of defective items.
8. What is normal distribution? A coin tossed 400 times. Find the probability that number of heads will not differ from 200 by more than 10.

Or

Define mean and variance of a random variable. Prove that if x is a random variable and k is a real number then:

- (i) $\text{var}(X+K) = \text{Var}(X)$
- (ii) $\text{Var}(KX) = k^2 \text{var}(X)$

THE END