HADHRAMOUT UNIVERSITY
COLLEGE OF COMPUTERS & INFORMATION TECHNOLOGY
Final Exam

Academic year: 2023-2024
Semester: First
Department: IT
Level: (2) b

20

Subject: statics &probability
Examiner: shohra bukir
Day and Date: 8-11-2023 , wed
Time allowed: 75 m.

Muna Majdi Marai

Question 1:Choose the correct answer :

1) 5P3 =
a) 60 ✓ b)15 c) 10

2) how many ways can a writer form 4 students
a) 4 ✓ b) 12 c) 24

3) If x such $0 < x \leq 100$, the probability of $x = n^2$, n is integer
a) $\frac{9}{100}$ b) $\frac{10}{99}$ c) $\frac{10}{100}$ ✓

4) Value of **n** in (np3)= 720 ⇒ n=
a)8 b)9 c)10 ✓

5) Throw a dice once ,what is the probability that is even number and greater 4 (equal or)
a) $\frac{1}{2}$ b) $\frac{1}{3}$ ✓ c) $\frac{2}{3}$

Question 2: the box contains 6 balls are red and 4 balls (black) ,how many ways can 3 boll , **find** the probability of

1) p(A) : two balls is red
$P(A) = \frac{{}^6C_2 \times {}^4C_1}{{}^{10}C_3} = \frac{15 \times 4}{120} = \frac{60}{120} = \frac{1}{2}$ ✓

2) p(B) : at least two balls is rad
$P(B) = \frac{{}^6C_2 \times {}^4C_1}{{}^{10}C_3} + \frac{{}^6C_3 \times {}^4C_0}{{}^{10}C_3} = \frac{60}{120} + \frac{20}{120} = \frac{80}{120} = \frac{2}{3}$ ✓

3) p(C) : at most one boll is rad
$P(C) = \frac{{}^6C_1 \times {}^4C_2}{{}^{10}C_3} + \frac{{}^4C_3 \times {}^6C_0}{{}^{10}C_3} = \frac{36}{120} + \frac{4}{120} = \frac{40}{120} = \frac{1}{3}$ ✓

4) p(E): boll from the same colors
$P(E) = \frac{{}^6C_3}{{}^{10}C_3} + \frac{{}^4C_3}{{}^{10}C_3} = \frac{20}{120} + \frac{4}{120} = \frac{1}{5}$ ✓

5) p(F) : bolls from the different colors $F = E'$
$P(F) = 1 - P(E) = 1 - \frac{1}{5} = \frac{4}{5}$ ✓

Question 3: Given an experiment such that : $P(A) = \frac{6}{10}$ $P(B) = \frac{3}{10}$ $P(AB) = \frac{1}{10}$ **find**

1)$P(\dot{A})$ 2) $P(A \cup B)$ 3) $P(\dot{A}B)$ 4)P(A|B) 5) $P(A|\dot{B})$

1) $P(A') = 1 - P(A) = 1 - \frac{6}{10} = \frac{2}{5}$ ✓

2) $P(A \cup B) = P(A) + P(B) - P(AB) = \frac{6}{10} + \frac{3}{10} - \frac{1}{10} = \frac{8}{10} = \frac{4}{5}$ ✓

3) $P(A'B) = P(B) - P(AB) = \frac{3}{10} - \frac{1}{10} = \frac{2}{10} = \frac{1}{5}$ ✓

4) $P(A \setminus B) = \frac{P(AB)}{P(B)} = \frac{\frac{1}{10}}{\frac{3}{10}} = \frac{1}{3}$ ✓

5) $P(A \setminus B') = \frac{P(AB')}{P(B')} = \frac{P(A) - P(AB)}{1 - P(B)} = \frac{\frac{6}{10} - \frac{1}{10}}{1 - \frac{3}{10}} = \frac{\frac{5}{10}}{\frac{7}{10}} = \frac{5}{7}$ ✓

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Academic year: 2023-2024
Semester: First
Department: IT
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Subject: statics &probability
Examiner: shohra bukir
Day and Date: 8-11-2023 , wed
Time allowed: 75 m.

Question 1:Choose the correct answer :

1) 5C3 =
a) 60 b)15 c)10

2) how many ways can a committee of 3 students out 7
a)210 b)35 c)840

3) A roll of dice nine times the occur are even number,what the possibility of a even number in the tenth time
a) $\frac{1}{10}$ b) $\frac{1}{2}$ c) $\frac{1}{6}$

4) Value of n in (nc11)= (n c17) =
a)28 b)6 c)15

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5) $\frac{80!}{79!}$ =
a)80 b)1 c)80!

Question 2: the box contains 6 balls are red and 6 balls are white numbered from 1-6 , **find** the probability of

1) p(A) : A red ball $= \frac{6}{12} = \frac{1}{2}$

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2) p(B) : a boll is even umber
$\frac{6}{12} = \frac{1}{2}$

3) p(C) : A red ball with a even number
$\frac{3}{12} = \frac{1}{4}$ X

4) p(E) :A white boll or a boll is odd number
$\frac{6}{12} + \frac{6}{12} = \frac{12}{12} =$ 1 X

5) p(F) :A red ball or a boll is even number
$\frac{6}{12} + \frac{6}{12} = \frac{12}{12} = 1$ X

Question 3: Given an experiment such that : $P(A)=\frac{1}{2}$ $P(B)=\frac{1}{3}$ $P(AB)=\frac{1}{6}$ find

1) $p(\dot{A})$ 2) $P(A \cup \dot{B})$ 3) $P(A|B)$ 4) $P(B|A)$ 5) $P(A|\dot{B})$

Academic year: 2023-2024
Semester: First
Department: IT
Level: 2

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Subject: statics &probability
Examiner: shohra bukir
Day and Date: 13-11-2023 , wed
Time allowed: 90 m.

Question 1: Fill in the blanks: $^nC_r = \frac{n!}{r!(n-r)!}$ (6)

1. 4C4 = $\frac{4!}{4!(4-4)!} = 1$ ✓
2. how many ways can a committee of 2 students out 7 = $\frac{7!}{(7-2)!} = \frac{n!}{(n-r)!}$ ✗ = 42
3. $\frac{8!}{7!} = \frac{8 \times 7!}{7!} = 8$ ✓
4. Value of n in $5\binom{n}{3} = 120\binom{n}{2}$ ⟹ n= 17 ✗ (n=4) ✗
   $5\ C_3 = 120$
5. How many different permutation of the letters in the word **coffee**.= $\frac{6!}{1!1!2!2!} = 180$ ✓

Question 2: x is integer number x such $1 \le x \le 50$, find the probability of (12)

1) p(A) : x is odd number {1, 3, ... 25} $\frac{25}{50}$ ✓
2) p(B) : x is a multiple of 13 {13, 26, 39} $\frac{3}{50}$ ✓
3) p(C) : x is not square number $\frac{43}{50}$ ✓ ($\frac{42}{50}$ ✗)
4) p(E) : x is not divisible by 10 {1, 2, ... 27} ✗ $\frac{45}{50}$ ✗
5) p(F) : $x = n^3$, n for some integer {1, 8, 27} $\frac{3}{50}$ ✓

Question 3: Given an experiment such that : P(A)= $\frac{1}{2}$ P(B) = $\frac{3}{8}$ P(AB) = $\frac{1}{4}$ find (15)

1) $P(\dot{A})$
$P(\dot{A}) = 1 - P(A)$
$= 1 - \frac{1}{2} = \frac{1}{2}$ ✓

2) P(A∪B)
$P(A \cup B) = P(A) + P(B) - P(AB) =$
$\frac{1}{2} + \frac{3}{8} - \frac{1}{4} =$
$\frac{5}{8}$ ✓

3) $P(\dot{A}B)$
$P(A'B) = P(B) - P(AB)$
$\frac{3}{8} - \frac{1}{4} = \frac{1}{8}$ ✓

4) P(B|A)
$= \frac{P(B \cap A)}{P(A)}$
$= \frac{\frac{1}{4}}{\frac{1}{2}} \cdot \frac{1}{4} \times \frac{2}{1}$
$= \frac{1}{2}$ ✓
($\frac{1}{8}$) ✗

5) P(A| $\dot{B}$)
$P(A|B') = \frac{P(A) - P(AB)}{1 - P(B)}$
$\frac{\frac{1}{2} - \frac{1}{4}}{1 - \frac{3}{8}} = \frac{2}{5}$ ✓

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Academic year: 2023-2024
Semester: First
Department: IT
Level: 2

الاسم/ بكيت محمد مبارك بلحسوان

Subject: statics &probability
Examiner: shohra bukir
Day and Date: wed
Time allowed: 90 m.

Question 1: x is integer number ,x such $1 \le x \le 50$, find the probability of

1) p(A) : x is odd number $\frac{25}{50} = \frac{1}{2}$

2) p(B) : x is a multiple of 13 $\frac{3}{50}$ (4)

3) p(C) : x is not square number (تربيع) $= \frac{43}{50}$

4) p(E) : x is not divisible by 10 $= \frac{9}{50}$

5) p(F) : $x = n^3$, n for some integer 1 2 , 3 , $= \frac{3}{50}$

Question 2: Given an experiment such that : P(A)=$\frac{1}{2}$ P(B) = $\frac{3}{8}$ P(AB) = $\frac{1}{4}$ find (6)

1) $p(\dot{A})$ 2) $P(A \cup \dot{B})$ 3) $P(\dot{A}B)$ 4) $P(B \setminus A)$ 5) $P(A \setminus \dot{B})$

1) $P(A') = 1 - \frac{1}{2} = \frac{1}{2}$, ~~$P(A \cup B) = P(A) + P(B) - P(AB) = \frac{1}{2} + \frac{3}{8} - \frac{1}{4} =$~~

3) $P(A'B) = P(B) - P(AB) = \frac{3}{8} - \frac{1}{4} = \frac{1}{8} \Rightarrow P(A'B) = \frac{3}{16} \Rightarrow \frac{3}{8} - \frac{3}{16}$

4) $P(B \setminus A) = \frac{P(AB)}{P(A)} = \frac{\frac{1}{4}}{\frac{1}{2}} = \frac{1}{2} \times 2 = \frac{1}{2}$ $\frac{3}{16}$

~~5) $P(A \setminus B') = \frac{P(AB')}{P(B')} = \frac{\frac{1}{4}}{1 - \frac{3}{8}} = \frac{1}{14} \times \frac{28}{5} = \frac{2}{5}$~~

~~$P(B') = 1 - P(B)$~~

2) $P(A \cup B') = P(A) + P(B') - P(AB') = \frac{1}{2} + \frac{5}{8} - \frac{1}{4} = \frac{7}{8}$

$-P(AB')$

5) $P(AB') = \frac{1}{2} \times \frac{5}{8} = \frac{5}{16} = \frac{\frac{5}{16}}{\frac{5}{8}} = \frac{5}{16} \times \frac{8}{5} = \frac{1}{2}$

$P(A \setminus B') = \frac{P(AB')}{P(B')} = \frac{\frac{1}{2} \times \frac{5}{8}}{\frac{5}{8}} = \frac{5}{16} \times \frac{8}{5} = \frac{1}{2}$ //

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سارة لطفي سالم بلفقيه

Academic year: *2023-2024*
Semester: *First*
Department: CS
Level: (2) b

20

Subject: statics &probability
Examiner: shohra bukir
Day and Date: 7-11-2023 , Tuesday
Time allowed: 75 m.

Question 1: put true or false :

1) $5C2 = 20$ $= 10$ False
2) how many ways can a writter form 4 students = 12 $= 4$ False
3) If x such $0 < x \leq 100$, the probability of x is multiple of 2= 20 $\frac{50}{100} = \frac{1}{2}$ False
4) Value of **n** in $(n\ \mathbf{p}\ 3) = 504 \Rightarrow n = 10$ $10P3 = 720$ False
5) Throw a dice once ,what is the probability that is greater 5 $= \frac{1}{3}$ $= \frac{1}{6}$ False

$A = \{6\}$ $S = \{1,2,3,4,5,6\}$
$P(A) = \frac{1}{6}$

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Question 2: a coin is tossed three times , **find**

1) Sample space for an event $S = \{HHH, HHT, HTT, TTT, THH, THT, HTH, TTH\} = 8$
2) First toss is tail $= \frac{4}{8} = \frac{1}{2}$
3) Get a head at least once $\frac{7}{8}$
4) second toss is a tail $\frac{4}{8} = \frac{1}{2}$
5) Get a tail at least once $\frac{7}{8}$

5

Question 3: Given an experiment such that : $P(A \cup B) = \frac{2}{3}$, $P(B) = \frac{1}{4}$, $P(AB) = \frac{1}{12}$ **find**

1) p(A|B) 2) P(B|A) 3) $P(B|\dot{A})$ 4) $P(\dot{A}|\dot{B})$

1) $P(A/B) = \frac{P(AB)}{P(B)} = \frac{\frac{1}{12}}{\frac{1}{4}} = \frac{1}{3}$

2) $P(B/A) = \frac{P(AB)}{P(A)}$

$P(A \cup B) = P(A) + P(B) - P(AB) \Rightarrow P(A) = P(A \cup B) - P(B) + P(AB)$

$\Rightarrow P(A) = \frac{2}{3} - \frac{1}{4} + \frac{1}{12} = \frac{1}{2}$

$P(B|A) = \frac{\frac{1}{12}}{\frac{1}{2}} = \frac{1}{6}$

3) $P(B|A') = \frac{P(BA')}{P(A')} = \frac{P(B) - P(AB)}{1 - P(A)} = \frac{\frac{1}{4} - \frac{1}{12}}{1 - \frac{1}{2}} = \frac{1}{3}$