COMPREHENSIVE EXAM.(CB)

COURSE: Probability and Statistics   **COURSE NO.:** MATH F113/AAOC C111

Max. Marks: 120   Weightage: 40%   Date: 08-01-2013   Duration: 3 hours

Instruction: *1. Write answers of **Part-A**, **Part-B** and **Part-C** in separate answer books.*
             2. Necessary table values are given in the question paper under heading "Table values".
             3. Non-programmable calculator is permitted.
             4. Attempt all the questions.

Table Values(as per standard notation): $t_{23,\,0.025} = 2.069$, $F(0.35) = 0.6379$, $F(2) = 0.9772$, $F(-1) = 0.1587$, $t_{99,0.025} = 1.984$, $z_{0.05} = 1.645$.

PART – A

1. There are three candidates A, B and C for a post of hostel warden. The candidates A and B have equal chance to be selected, but chance of C is half of that of A. If A is selected then there is a probability 0.4 that quality of life in the hostel will improve. Similarly, if B is selected then this probability is 0.5 and if C is selected this probability is 0.6.
    a) Find the probability that
        i) A will be selected;
        ii) C will be selected.
    b) Find the probability that C will be selected and the quality of life in the hostel will improve.
    c) Find the probability that A will be selected but the quality of life in the hostel will not improve.   [10]

2. The distribution of a random variable X is given in the following table:

x	2	4	6	8	10
$f(x)$	0.254	0.135	0.220	0.324	0.067

    a) Find $E(X)$ and $Var(X)$.   [5]
    b) Find $P(X \ge 4)$.   [2]
    c) Find the moment generating function of X.   [3]

3. Assume that the increase in demand for electric power in millions of kilowatt hours in a particular area is a random variable with density function

$$f(x) = kx^3, \quad 0 < x < 2.$$

    a) Find the value of k.   [2]
    b) Find $P(0.5 \le X \le 1.5)$ and $P(1 \le X \le 2.5)$.   [4]
    c) Find $E(X^2 + 4X - 2)$.   [4]

4. The probability that a person can hit a given target in each firing is 0.45. He will fire 6 times.
   a) What is the probability that he will hit the target at least 4 times?
   b) What is the probability that he will miss the target at most 3 times?
   c) What is the probability that he will fail to hit the target ? [10]

PART-B

5. The joint pdf of two random variables X and Y is

$$f(x,y) = \frac{x(1+3y^2)}{4}; 0<x<2, 0<y<1$$
$$= 0 \quad ; \text{elsewhere}$$

   Find

   (a) $P(1<X<2, Y<0.5)$

   (b) $f(x)$ i.e marginal density of x.

   (c) Conditional density of y given x, $f(y/x)$. [10]

6. Police response time to an emergency call is the time difference between the time the call is first received and the time that a patrol car has arrived at the scene. It has been observed that this response time follows normal distribution with mean 8.4 minutes and standard deviation 1.7 minutes.
   a) What percentage of response times are longer than 9 minutes?
   b) What percentage of response times are between 6.7 minutes and 11.8 minutes? [10]

7. Sulphur dioxide and nitrogen oxide are both products of fossil fuel consumption. These compounds can be carried long distances and converted to acid before being deposited in the form of "acid rain". These data were obtained on the sulphur dioxide concentration (in micrograms per cubic meter) in a Bavarian forest thought to have been damaged by acid rain: 52.7, 43.9, 41.7, 71.5, 47.6, 55.1, 62.2, 56.5, 33.4, 61.8, 54.3, 50.0, 45.3, 63.4, 53.9, 65.5, 66.6, 70.0, 52.4, 38.6, 46.1, 44.4, 60.7, 56.4. Find 95% confidence interval on the mean sulphur dioxide concentration in this forest. [10]

8. a) Simulate a value of an exponential variable with $\beta = 0.352$. Use the random number 0.534.
   b) The number of mails that a department receives each day can be modeled by a distribution having mean 44 and standard deviation 8. From a random sample of 36 days, what can be said about the probability that the sample mean will be at most 42 or at least 46 using Chebychev's theorem? [10]

PART – C

9. An automobile manufacturer substitutes a different engine in cars that were known to have an average miles-per-gallon rating of 31.5 on the highway. The manufacturer wants to test whether the new engine changes the average miles-per-gallon rating of the automobile model. A random sample of 100 trial runs gives $\bar{x} = 29.8$ miles per gallon and $s = 6.6$ miles per gallon. Using the 0.05 level of significance, is the average miles-per-gallon rating on the highway for cars using the new engine different from the rating for cars using the old engine? [10]

10. An article describes how finance incentives by the major automakers are reducing banks' share of the market for automobile loans. The article reports that in 1980, banks wrote about 53% of all car loans, and in 1995, the banks' share was only 43%. Suppose that these data are based on a random sample of 100 car loans in 1980, where 53 of the loans were found to be bank loans; and the 1995 data are also based on a random sample of 100 loans, 43 of which were found to be bank loans. Carry out a two-tailed test of the equality of banks' share of the car loan market in 1980 and in 1995. Take $\alpha = 0.1$. [10]

11. Suppose that we had the following results from an experiment in which we measured the growth of a cell culture (as optical density) at different pH levels.

pH (x)	3	4	4.5	5	5.5	6	6.5	7	7.5
Optical Density (y)	0.1	0.2	0.25	0.32	0.33	0.35	0.47	0.49	0.53

Find the regression equation y on x. [10]

12. The following data are indexed prices of gold and copper over a 10 year period. Assume that the indexed values constitute a random sample from the population of possible values.

Gold	76	62	70	59	52	53	53	56	57	56
Copper	80	68	73	63	65	68	65	63	65	66

Find the correlation coefficient. [10]

COURSE: Probability and Statistics **COURSE NO.:** MATH F113/AAOC C111

Max. Marks: 60 Weightage: 20% Date: 13-12-2012 Time: 8:00 am to 8:50 am

Prescribed Textbook and hand-written class notes are allowed. Non-programmable calculator is permitted.

Attempt all the questions.

1. Following table defines the joint density of two random variables X and Y:

Y / X	1	2	3
1	0.05	0.10	0.20
2	0.05	0.10	0.10
3	0.10	0.20	0.10

   a) Find $P(X = 2 \, or \, Y > 2)$.
   b) Find $Cov(X,Y)$. [12]

2. The joint density of two continuous random variables X and Y is defined as follows:
   $f(x,y) = k(x+y)$, $0 \le x \le 2, 0 \le y \le 2, x+y \ge 2$. Find the value of k. [8]

3. Assume that a group is drilling wells in various parts of the country so that the status of one well has no bearing on that of any other. Let X denote the number of wells drilled to obtain the first strike. This random variable is said to follow geometric distribution with the parameter p unknown.
   a) Find the maximum likelihood estimate for p based on a sample of size n.
   b) Find the maximum likelihood estimate for p based on these data:
      32, 15, 22, 29, 35, 18, 20, 27, 28, 40 [10]

4. Suppose you do a study of acupuncture to determine how effective it is in relieving pain. You measure sensory rates for 15 subjects with the results given below. Use the sample data to construct a 95% confidence interval for the mean sensory rate for the population (assumed normal) from which you took the data.
   8.6, 9.4, 7.9, 6.8, 8.3, 7.3, 9.2, 9.6, 8.7, 11.4, 10.3, 5.4, 8.1, 5.5, 6.9. [10]

5. The tensile strength of synthetic fibers can be determined by tying two strands together and pulling until either the right-or left hand side breaks If 144 pairs of strands will be broken, what does Chebychev's theorem with $k = 4$ tell us about the number of cases where the left hand strand broke? [10]

6. In a certain city, the number of power outages per month is a random variable having a distribution with $\mu = 11.6$ and $\sigma = 3.3$. If this distribution can be approximated closely with a normal distribution, what is the probability that there will be at least 8 outages in any one month? [10]

TEST– I(CB)

COURSE: Probability and Statistics   **COURSE NO.:** MATH F113/AAOC C111
Max. Marks: 75   Weightage: 25%   Date: 21-10-2012   Duration: 8:00 am to 8:50 am

Attempt all the questions.

1. There are 18 students in an elective class and 10 of them are staying in the hostel. Ten students from this class are selected at random. Let X be the number of students in this group of selected students who are not staying in the hostel.
   a) Find the possible values that X can take.
   b) Write down the expression for the density function of X.
   c) Find the probability that exactly 4 of these selected students are staying in the hostel.
   [15]

2. A defective production process produces defective products in a Poisson process with an average 0.2 defective per hour. The process runs for 6- hour a day.
   a) Find the probability that there will be at least 2 defectives in a period of 2 days.
   b) Find the probability that there will be no defective in a period of 3 days.   [10]

3. The probability that the noise level of a wide – band amplifier will exceed 2 dB is 0.05.
   (i) Find the probabilities that among 12 such amplifiers the noise level of
      (a) At most two will exceed 2 dB
      (b) Exactly 3 will exceed 2 dB.
   (ii) On an average the noise level of how many amplifiers will exceed 2 dB.   [10]

4. In a bolt producing factory, machine A, B and C are producing 30%, 30% and 40% items respectively. Machine A is producing 2% defective items, B and C are producing 4% and 5% defective items of their total production. One bolt is chosen at random from a large lot of bolts produced by this factory.
   (a) What is the probability that this chosen bolt is defective?
   (b) If this chosen bolt is defective, find the probability that this bolt is produced by machine C.   [15]

5. Assume that the time it takes a student to walk from one class to the next class ranges uniformly from 0 to 15 minutes.
   a) State the density function $f(x)$
   b) What is the probability that a student will be late to his next class if there is a 10-minute break between classes
   c) What is the probability that it will take the student between 5 and 13 minutes to get to class?   [10]

6. In a certain city, the daily consumption of electric power (in millions of kilowatt hours) is a random variable X having the probability density

$$f(x) = \begin{cases} ke^{-x/3}, & x > 0 \\ 0, & x \le 0 \end{cases}$$

a) Find the value of k.

b) Find the cumulative distribution function $F(x)$ of X.

c) If the city's power plant has a daily capacity of 12 million kilowatt-hours, what is the probability that this power supply will be inadequate on any given day?

[15]

B

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x$, $2 \le x \le 4$. If this function defines the density function of a continuous random variable, the value of k is ___ $\ln 4 - 2$ ___

2. If one parameter of a uniform distribution is -4 and the mean is -2, then the other parameter is ___ 0 ___ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.1
2	0.1	0	0.1
3	0.1	0.1	0
4	0.1	0	0.3

The value of $E(X) = $ ___ 2.8 ___ and $E(Y) = $ ___ 1.2 ___ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^3 y^3$, $0 \le x \le 2, 0 \le y \le 2$. The value of k is ___ $1/16$ ___ .

5. If X follows exponential distribution with mean 1.5, then $P(X \ge 3) = $ ___ e^{-2} ___ .

6. The weight of randomly chosen bottle has expected value 400 pounds and standard deviation 50 pounds. Using Chebyshev's inequality the lower bound of the probability that the weight of randomly chosen bottle deviates more than 100 pounds from the expected value of the weight is ___ $1/4$ ___ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 3$, then

$$E(X) = \frac{1}{\sqrt[3]{2}}\, \Gamma(4/3) \quad \text{and} \quad Var(X) = \frac{1}{\sqrt[3]{4}}\left[\Gamma(5/3) - \left(\Gamma(4/3)\right)^2\right]$$

BITS, PILANI – DUBAI CAMPUS
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2012-2013

QUIZ – II(CB)

COURSE: Probability and Statistics **COURSE NO.:** AAOC C111/MATH F113
Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 2 \leq x \leq 4$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -4 and the mean is -2, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.1
2	0.1	0	0.1
3	0.1	0.1	0
4	0.1	0	0.3

   The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^3 y^3, 0 \leq x \leq 2, 0 \leq y \leq 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 1.5, then $P(X \geq 3) =$ _____ .

6. The weight of randomly chosen bottle has expected value 400 pounds and standard deviation 50 pounds. Using Chebyshev's inequality the lower bound of the probability that the weight of randomly chosen bottle deviates more than 100 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 3$, then $E(X) =$ _____ and $Var(X) =$ _____ .

B

QUIZ – II(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113
Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

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Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x$, $2 \leq x \leq 3$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -4 and the mean is 2, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.1
2	0.1	0	0.1
3	0.2	0.1	0
4	0.2	0	0.1

The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^2 y^2$, $0 \leq x \leq 2$, $0 \leq y \leq 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 1.5, then $P(X \geq 1.5) =$ _____ .

6. The weight of randomly chosen bottle has expected value 400 pounds and standard deviation 50 pounds. Using Chebyshev's inequality the lower bound of the probability that the weight of randomly chosen bottle deviates more than 200 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 2$, then $E(X) =$ _____ and $Var(X) =$ _____ .

BITS, PILANI – DUBAI CAMPUS
I YEAR – I SEMESTER
2012-2013

QUIZ – II(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

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NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 1 \le x \le 2$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -2 and the mean is 4, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.2
2	0.1	0	0
3	0.2	0.1	0
4	0.2	0	0.1

The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^2 y^3, 0 \le x \le 1, 0 \le y \le 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 2, then $P(X \ge 2) =$ _____ .

6. The weight of randomly chosen bottle has expected value 500 pounds and standard deviation 100 pounds. Using Chebyshev's inequality the lower bound of the probability that the weight of randomly chosen bottle deviates more than 200 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 1$, then $E(X) =$ _____ and $Var(X) =$ _____ .

BITS, PILANI – DUBAI CAMPUS
I YEAR – I SEMESTER
2012-2013

QUIZ – II(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

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NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 1 \le x \le 3$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -2 and the mean is 2, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

Y / X	0	1	2
1	0	0.1	0.1
2	0.1	0	0
3	0.3	0.1	0
4	0.2	0	0.1

   The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x, y) = kx^2 y^2, 0 \le x \le 1, 0 \le y \le 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 1.5, then $P(X \ge 2) =$ _____ .

6. The weight of randomly chosen bottle has expected value 500 pounds and standard deviation 100 pounds. Using Chebyshev's inequality the lower bound of the probability that the weight of randomly chosen bottle deviates more than 300 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 1$ and $\beta = 2$, then $E(X) =$ _____ and $Var(X) =$ _____ .

A

QUIZ – II(CB)

COURSE: Probability and Statistics **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

NAME: **ID. NO.:** **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 1 \leq x \leq 2$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -2 and the mean is 4, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.2
2	0.1	0	0
3	0.2	0.1	0
4	0.2	0	0.1

   The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^2 y^3, 0 \leq x \leq 1, 0 \leq y \leq 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 2, then $P(X \geq 2) =$ _____ .

6. The weight of randomly chosen bottle has expected value 500 pounds and standard deviation 100 pounds. Using Chebyshev's inequality the lower bound of the probability that the weight of randomly chosen bottle deviates more than 200 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 1$, then $E(X) =$ _____ and $Var(X) =$ _____ .

A A

NAME: ID. NO.:   SEC:

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 1 \leq x \leq 3$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -2 and the mean is 2, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.1
2	0.1	0	0
3	0.3	0.1	0
4	0.2	0	0.1

   The value of $E(X) = $ _____ and $E(Y) = $ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^2 y^2, 0 \leq x \leq 1, 0 \leq y \leq 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 1.5, then $P(X \geq 2) = $ _____ .

6. The weight of randomly chosen bottle has expected value 500 pounds and standard deviation 100 pounds. Using Chebyshev's inequality the upper bound of the probability that the weight of randomly chosen bottle deviates more than 300 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 1$ and $\beta = 2$, then $E(X) = $ _____ and $Var(X) = $ _____ .

B

QUIZ – II(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

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NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 2 \leq x \leq 3$. If this function defines the density function of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -4 and the mean is 2, then the other parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.1
2	0.1	0	0.1
3	0.2	0.1	0
4	0.2	0	0.1

The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^2y^2, 0 \leq x \leq 2, 0 \leq y \leq 2$. The value of k is _____ .

5. If X follows exponential distribution with mean 1.5, then $P(X \geq 1.5) =$ _____ .

6. The weight of randomly chosen bottle has expected value 400 pounds and standard deviation 50 pounds. Using Chebyshev's inequality the ~~lower~~ upper bound of the probability that the weight of randomly chosen bottle deviates more than 200 pounds from the expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 2$, then $E(X) =$ _____ and $Var(X) =$ _____ .

BÆ

QUIZ – II(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113
Max. Marks: 21   Weightage: 7%   Date: 22-11-2012   Time: 12:20 pm to 12:40 pm

NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil.
Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator
is permitted.

Fill in the blanks with correct answers:

1. Consider the function $f(x) = k \ln x, 2 \le x \le 4$. If this function defines the density function

    of a continuous random variable, the value of k is _____ .

2. If one parameter of a uniform distribution is -4 and the mean is -2, then the other

    parameter is _____ .

3. The joint density of two random variables X and Y is given below:

X \ Y	0	1	2
1	0	0.1	0.1
2	0.1	0	0.1
3	0.1	0.1	0
4	0.1	0	0.3

    The value of $E(X) =$ _____ and $E(Y) =$ _____ .

4. The joint density of two random variables X and Y is $f(x,y) = kx^3 y^3, 0 \le x \le 2, 0 \le y \le 2$.

    The value of k is _____ .

5. If X follows exponential distribution with mean 1.5, then $P(X \ge 3) =$ _____ .

6. The weight of randomly chosen bottle has expected value 400 pounds and standard

    deviation 50 pounds. Using Chebyshev's inequality the ~~lower~~ ^{upper} bound of the probability

    that the weight of randomly chosen bottle deviates more than 100 pounds from the

    expected value of the weight is _____ .

7. If the random variable X has Weibull distribution with parameters $\alpha = 2$ and $\beta = 3$, then

    $E(X) =$ _____ and $Var(X) =$ _____ .

BITS, PILANI – DUBAI CAMPUS
I YEAR – I SEMESTER
2012-2013

QUIZ – I(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 24   Weightage: 8%   Date: 03-10-2012   Duration: 8:00 am to 8:20 am

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NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. In T20 matches, the probability that Virender Sehwag remains notout for five overs is 0.25. If he remains notout for five overs, there is a probability 0.75 that India will win the match. The probability that Vireder Sehwag will remain notout for five overs and India will lose the match is _____ .

2. If for any two events A and B, $P(A \cup B) = 0.6$ and $P(A \cap B) = 0.3$, then $P(A) + P(B) = $ _____ .

3. If for two independent events A and B, $P(B) = 0.8$ and $P(A \cap B) = 0.5$, then $P(A) = $ _____ .

4. Number of different ways that one can make a first, second, third and fourth choice among 12 firms leasing construction equipment is _____ .

5. In tossing three coins at a time, the probability of getting exactly one head is _____

6. If $E(X) = 5$ and $Var(X) = 2$, then $E(2X - 5) = $ _____ and $Var(2X - 5) = $ _____ .

7. Consider a discrete random variable X that can assume the values 0, 1, 2 and 3 with probabilities 0.15, 0.28, 0.4 and 0.17 respectively. The value of $E(X^2)$ is _____ .

8. If the mean of a geometric distribution is 4, the variance is _____ .

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BITS, PILANI – DUBAI CAMPUS
I YEAR – I SEMESTER
2012-2013

QUIZ – I(CB)

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COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

Max. Marks: 24   Weightage: 8%   Date: 03-10-2012   Duration: 8:00 am to 8:20 am

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NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. In T20 matches, the probability that Virender Sehwag remains notout for five overs is 0.25. If he remains notout for five overs, there is a probability 0.75 that India will win the match. The probability that Vireder Sehwag will remain notout for five overs and India will lose the match is _____ .

2. If for any two events A and B, $P(A \cup B) = 0.4$ and $P(A \cap B) = 0.3$, then $P(A) + P(B) =$ _____ .

3. If for two independent events A and B, $P(B) = 0.6$ and $P(A \cap B) = 0.5$, then $P(A) =$ _____ .

4. Number of different ways that one can make a first, second, third and fourth choice among 9 firms leasing construction equipment is _____ .

5. In tossing two coins at a time, the probability of getting exactly one head is _____ .

6. If $E(X) = 5$ and $Var(X) = 4$, then $E(2X - 5) =$ _____ and $Var(2X - 5) =$ _____ .

7. Consider a discrete random variable X that can assume the values 0, 1, 2 and 3 with probabilities 0.15, 0.2, 0.48 and 0.17 respectively. The value of $E(X^2)$ is _____ .

8. If the mean of a geometric distribution is 2, the variance is _____ .

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BITS, PILANI – DUBAI CAMPUS
I YEAR – I SEMESTER
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QUIZ – I(CB)

COURSE: Probability and Statistics   **COURSE NO.:** AAOC C111/MATH F113

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NAME: **ID. NO.:**   **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. In T20 matches, the probability that Virender Sehwag remains notout for five overs is 0.2. If he remains notout for five overs, there is a probability 0.8 that India will win the match. The probability that Vireder Sehwag will remain notout for five overs and India will lose the match is _____ .

2. If for any two events A and B, $P(A \cup B) = 0.4$ and $P(A \cap B) = 0.2$, then $P(A) + P(B) =$ _____ .

3. If for two independent events A and B, $P(B) = 0.8$ and $P(A \cap B) = 0.2$, then $P(A) =$ _____ .

4. Number of different ways that one can make a first, second, third and fourth choice among 11 firms leasing construction equipment is _____ .

5. In tossing two coins at a time, the probability of getting at most one head is _____

6. If $E(X) = 8$ and $Var(X) = 4$, then $E(2X - 5) =$ _____ and $Var(2X - 5) =$ _____ .

7. Consider a discrete random variable X that can assume the values 0, 1, 2 and 3 with probabilities 0.18, 0.28, 0.44 and 0.1 respectively. The value of $E(X^2)$ is _____ .

8. If the mean of a geometric distribution is 8, the variance is _____ .

BITS, PILANI – DUBAI CAMPUS
I YEAR – I SEMESTER
2012-2013

QUIZ – I(CB)

COURSE: Probability and Statistics **COURSE NO.:** AAOC C111/MATH F113
Max. Marks: 24 Weightage: 8% Date: 03-10-2012 Duration: 8:00 am to 8:20 am

NAME: **ID. NO.:** **SEC:**

Attempt all the questions. No marks will be awarded for overwriting and multiple answers. Do not use pencil. Each question carries 3 marks. No extra sheet will be given for rough works. Non-programmable Calculator is permitted.

Fill in the blanks with correct answers:

1. In T20 matches, the probability that Virender Sehwag remains notout for five overs is 0.25. If he remains notout for five overs, there is a probability 0.85 that India will win the match. The probability that Vireder Sehwag will remain notout for five overs and India will lose the match is _____ .

2. If for any two events A and B, $P(A \cup B) = 0.6$ and $P(A \cap B) = 0.2$, then $P(A) + P(B) = $ _____ .

3. If for two independent events A and B, $P(B) = 0.8$ and $P(A \cap B) = 0.4$, then $P(A) = $ _____ .

4. Number of different ways that one can make a first, second, third and fourth choice among 10 firms leasing construction equipment is _____ .

5. In tossing three coins at a time, the probability of getting at most one head is _____ .

6. If $E(X) = 8$ and $Var(X) = 2$, then $E(2X - 5) = $ _____ and $Var(2X - 5) = $ _____ .

7. Consider a discrete random variable X that can assume the values 0, 1, 2 and 3 with probabilities 0.18, 0.28, 0.4 and 0.14 respectively. The value of $E(X^2)$ is _____ .

8. If the mean of a geometric distribution is 5, the variance is _____ .