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西交利物浦大学

MTH102 Engineering Mathematics II

Sem 2, Year: 2017/18

Assignment 1 Week: 5

March28, 2018

The assignment is due Wednesday April 4 at 5pm.
You will need to enter your answers on ICE. Beware that **on ICE the multiple choices will be presented in random order**. Therefore you need to choose the right answer from the list and not the right reference letter when entering your answers.
Do not submit hard copies, only the answers entered on ICE will be graded.
Late submissions will not be accepted.
The assignment comprises of xx questions. The assignment is worth 5% of the course mark.

Questions

Questions Q1 and Q.2 are based on the following information:
Let X_1 and X_2 the result of rolling two dice one after the other, respectively, and $Y = X_1 + X_2$ their sum.

Q.1 [10 marks]

Find $P(X_1 < X_2)$;

(a) 1/2
(b) 21/36
(c) 15/36
(d) 19/36

Q.2 [10 marks]

$P(Y \leq 5 \cup Y$ is odd$)$ is equal to

(a) 22/36
(b) 18/36
(c) 20/36
(d) 30/36

Questions Q3 and Q4 are based on the following information:
In a box there are 20 computer chips of type A and 40 of type B. The probability that a type A chip is defective is 0.05 and for a type B chip this probability is 0.1.

Q.3 [20 marks]

The probability that a randomly picked chip is of type B and defective is equal to?

(a) $1/12$
(b) $1/15$
(c) $1/2$
(d) $3/40$

Q.4 [20 marks]

The probability that a randomly picked chip is defective is?

(a) $1/12$
(b) $1/15$
(c) $1/2$
(d) $3/40$

Questions Q.5 and Q.6 are based on the following information:
The probability density function of the variable X is defined as

$$f(x) = \begin{cases} ax + bx^2 & \text{if } 0 < x \leq 1 \\ 0 & \text{otherwise.} \end{cases}$$

We know that $P(X \leq 1/3) = 2/27$.

Q.5 [20 marks]

Find a and b so that $f(x)$ is a proper pdf

(a) $a = 0,\ b = 1$
(b) $a \in [0, 1],\ b = 1 - a$
(c) $a = 1,\ b = 3/2$
(d) $a = 1/2,\ b = 1/2$

Q.6 [20 marks]

Find $P(0.25 < X \leq 0.5)$

(a) 0.1484
(b) 0.625
(c) 0.3125
(d) 0.5078