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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
SUMMER SEMSTER (JUNE – JULY 2018)
MID TERM EXAMINATION

COURSE CODE: 10B11MA311 MAX. MARKS: 50
COURSE NAME: PROBABILITY & STATISTICS
COURSE CREDITS: 4 MAX. TIME: 2 Hr

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of scientific calculator is allowed.*

1. Answer the following questions: (2x5 = 10 Marks)
   (a) Give an example of a sure event with a random experiment.
   (b) What is $P(A \; XOR \; B)$?
   (c) If $A \subseteq B$ then $P(B \mid A) =$ _____.
   (d) State total probability theorem.
   (e) If A and B are independent events, then $\overline{A}$ and $\overline{B}$ are also independent. Is it true or false? Justify your answer with proof.
2. A die is loaded in such a way that the probability of the face with j dots turning up is proportional to j for j = 1, 2, ..., 6. What is the probability, in one roll of the die, that an odd number of dots will turn up? (5)
3. A box X contains 2 white and 3 red balls. Another box Y contains 4 white and 5 red balls. One ball is drawn from one of the boxes and is found to be red. What is the probability that it was drawn from box Y? (5)
4. A box contains tags from 1 to 50. 6 tags are being taken out in random. What is the probability that there will be three consecutive pairs of tags? (5)
5. A die is thrown thrice. A success is 'getting 1 or 6' on a throw. Find the mean and the variance of the number of successes. (6)
6. A random variable X has density function $f(x) = \begin{cases} ce^{-3x}; & x > 0 \\ 0 & x \le 0 \end{cases}$. Find the constant c. Also, find $P(1 < X < 2)$, $P(X \ge 3)$, $P(X < 1 \mid X < 3)$. (8)
7. Find the value of Median from the following data: (5)

No. of days for which absent (less than)	5	10	15	20	25	30	35	40	45
No. of students	29	195	241	117	52	10	6	3	2

8. Find the mode and variance from the following data: (6)

Age	0 – 6	6 – 12	12 – 18	18 – 24	24 – 30	30 – 36	36 – 42
Frequency	6	11	25	35	18	12	6

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