

F.Y.B.SC. SEM – I (2014 Course) : WINTER - 2018

**SUBJECT : STATISTICS : DISCRETE PROBABILITY AND
PROBABILITY DISTRIBUTIONS – I**

Day : Saturday
Date : 20/10/2018

W-2018-0778

Time : 12.00 NOON TO 02.00 PM
Max. Marks : 40

N. B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of algorithmic table, statistical table and pocket **CALCULATOR** is allowed.

Q. 1 Attempt **ANY TWO** of the following: **(10)**

- a) Explain the term 'Random experiment' and 'Sample space' with an illustration.
- b) A box contain 3 red and 5 black balls. Two balls are drawn at random from it, find the probability of selecting different colour balls.
- c) Let A and B be two events of Ω such that $P(A) = 0.4$, $P(B) = 0.7$ and $P(A \cup B) = 0.8$ then evaluate:
 - i) $P(A \cap B)$
 - ii) $P(A' \cup B')$
 - iii) $P(A' \cap B)$
 - iv) $P(A' \cup B')$

Q. 2 Attempt **ANY TWO** of the following: **(10)**

- a) Let A, B and C forms a partition of Ω .
If $P(A) = 2P(B) = 3P(C)$, find $P(A \cup B)$.
- b) Define probability model. Let $\Omega = \{w_1, w_2, w_3, w_4, w_5\}$. Verify whether following model is probability model or not:
 $P(w_1) = 0.12$, $P(w_2) = 0.28$, $P(w_3) = 0.35$, $P(w_4) = 0.2$, $P(w_5) = 0.05$.
- c) Let X be discrete r.v. with probability distribution as below:

X	1	2	3	4	5
P(x)	0.1	0.3	0.4	0.15	0.05

Compute mean and variance of X.

P. T. O.

Q. 3 Attempt **ANY TWO** of the following: **(10)**

- a) State and prove Baye's theorem.
- b) The first three moments about the value 3 for a certain probability distribution are 1, 16 and 40 respectively. Find the mean, variance and third central moment of the distribution.
- c) A fair coin is tossed three times, find the probability of getting at least one head.

Q. 4 Attempt **ANY FIVE** of the following: **(10)**

- a) Define mutual independence of three events.
- b) Obtain the mean of Uniform distribution.
- c) Define c.g.f. of discrete r.v.X. State anyone property of it.
- d) Define degenerate distribution.
- e) If A and B are two events of Ω such that:
 $P(A) = 0.4, P(B) = 0.7, P(A \cap B) = 0.3$
then compute $P(A' / B)$ and $P(B' / A)$.
- f) Define mode and median of a discrete r.v.
- g) Let $X \rightarrow B(n = 10, p = 0.7)$. Obtain the mean and variance of X.

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