B.Sc. (Part-I) (Semester-I) (CBCS (NEP2020) Examination, Oct. / Nov. 2023
STATISTICS (Paper – II)
Elementary Probability Theory
Sub. Code: 88183

Day and Date: Saturday, 04/11/2023
Time : 02:30 p.m. to 04:30 p.m. **Total Marks: 40**

Instructions : i) All questions are compulsory .
ii)Figures to the right indicate full marks.

Q.1 Choose the correct alternative: **(08)**

1) Which of the following is not an example of random experiment?
A) rolling of a die B) tossing of a coin C) reading book D) detection of blood group

2) Intersection of two events A and B means the set of points that belongs to …
A) only in A B) either in A or in B C) only in B D) both A and B

3) The event does not contain any sample point of a sample space is called …
A) Impossible event B) sure event C) favorable event D) None of these

4) Probability of an event lies between …….
A) $-\infty$ and $+\infty$ B) 0 and 1 C) –1 and +1 D) 0 and $+\infty$

5) Which of the following is not an axiom of probability……
A) $P(A) \geq 0$ B) $P(\Omega) = 1$ C) $P(\Omega) \leq 1$ D) $P(A \cup B)=P(A)+P(B)$, if $A \cap B=\phi$

6) If X is a discrete r.v. with mean E(X), then $E[(X-E(X)]^2$ is called…
A) Mean B) Variance C) S.D. D) Median

7) If F(x) is the distribution function of random variable X then
A) $0 \leq F(x) \leq \infty$ B) $0 \leq F(x) \leq 1$ C) $-1 \leq F(x) \leq 1$ D) $-\infty \leq F(x) \leq \infty$

8) Following is the p. m. f. of r. v. X the Mode of r. v. X is…

X	20	40	60	80	100
P(x)	0.2	0.4	0.2	0.1	0.1

A) 40 B) 60 C) 80 D) 0.4

Q. 2 Attempt any ***two*** of the following. **[16]**

1) Define with example a) Sample Space b) Event c) Certain Event d) Mutually exclusive events
2) State and prove addition law of probability
3) State and prove Bayes' theorem

Q. 3 Attempt any ***Four*** of the following. **[16]**

1) Show that $P(A^c \cap B) = P(B) - P(A \cap B)$
2) Define Power set and illustrate with example
3) Define cumulative distribution function (c.d.f.) of a discrete r. v. and state their properties.
4) Define pairwise independence and mutually independence of three events
5) A random variable X has the following probability distribution

X	– 3	– 2	2	3
P(x)	0.2	0.3	0.3	0.2

Find a) E(X) b) V(X)

6) If X is a discrete random variable, then define Median and mode

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