



QP CODE: 21102155



21102155

Reg No :

Name :

B.Sc DEGREE (CBCS) EXAMINATION, AUGUST 2021

Third Semester

B.Sc Psychology Model I

COMPLEMENTARY COURSE - ST3CMT23 - PROBABILITY AND PROBABILITY DISTRIBUTIONS

2017 Admission Onwards

0A11FDCB

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Give any two advantages of empirical definition of probability.
2. What is the 3rd axiom in probability theory?
3. What do you mean by conditional probability?
4. Give the addition theorem in probability theory.
5. Define a random variable.
6. Define a discrete random variable.
7. If $V(x)=2$ find $V(2x+5)$
8. If $V(X+Y)=V(X)+V(Y)$ then X and Y must be ____
9. What is the mode and median of standard normal distribution?
10. If $X \sim N(0,1)$, the $P(X=0)$ is
11. If $X \sim N(10,4)$, explain the standardisation of X
12. If $X \sim N(0,1)$ then $P(X < 0) =$

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Consider the random experiment of tossing 3 coins at a time, find probability of at least two heads.





14. Two unbiased dice are thrown, find the probability that i) both the dice shows the same number ii) the total of the numbers on the dice is 8
15. State and prove multiplication theorem in probability.
16. Define pmf and what are its properties?

17. A random variable X has the following probability mass function

X	-2	-1	0	1	2	3
$P(X)$	0.1	k	0.2	$2k$	0.3	k

Find the value of k and find its expectation.

18. Explain the expectation of random variable and state its properties.
19. A coin is tossed 10 times what is the probability of getting exactly 6 heads?
20. The probability of hitting a target is 0.3 in a series of 7 trials. What is the probability of hitting the target atleast 4 times?
21. Explain the standard normal distribution. State its properties.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **15** marks.

22. Define statistical independence. State and prove multiplication theorem in probability.
23. A random variable X has the following probability density function

X	0	1	2	3	4	5	6	7
$P(X)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2+k$

i) Find k ii) $P(X \geq 6)$ iii) $P(0 < X < 5)$

24. If $X \sim B(8,0.2)$. Find its mean and standard deviation also draw the pmf of X .
25. Explain the standard normal distribution. The average speed of a car is 65 kmph with a standard deviation of 4. Find the probability that the speed is less than 60 kmph assume normality.

(2×15=30)

