QP CODE: 18103564

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Reg No : .....

Name : .....

B.Sc. DEGREE (CBCS) EXAMINATION, NOVEMBER 2018

Third Semester

B.Sc Psychology Model I

COMPLEMENTARY COURSE - ST3CMT23 - PROBABILITY AND PROBABILITY DISTRIBUTIONS

2017 Admission Onwards

084E70B2

Maximum Marks: 80 **Time: 3 Hours**

Part A

Answer any **ten** questions.

Each question carries **2** mark.

1. Define the sample space of random experiment.
2. What is the frequency definition of probability
3. If two events A and B are mutually exclusive and P(A)=0.3 and P(B)=0.5 then find the probability that either A or B will occur is
4. State the multiplication theorem in probability
5. If X is a contoinous random variable, and 'c' is a constant then P(X=c) =
6. Define the pmf of random variable
7. Give any two properties of variance of a random variable X
8. If E(X)=3.5, find E(2x+7)
9. What is the mean and variance of normal distribution
10. What is the kurtosis of normal curve
11. What is the advantages of standardisation in normal distribution
12. If X~ N(0,1) then P(X<1) =

(10×2=20)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Diffrentiate between classical and frequency definitions of probability
14. If A is an event and A^c is its compliment then show that $P(A) + P(A^c) = 1$
15. Two dice are tossed. Find the probability of getting an even number on the first die or a total of 8.

16. Diffrentiate between discrete and continous random variable with suitable example

17. The pdf of discrete random variable is given by $f(x) = kx^2$, $x = 1, 2, 3$ find the value of k. also find its mean.

18. Define the distribution function of a random variable and state its properties

19. A die marked A to E is rolled 50 times. Find the probability of getting a “D” exactly 5 times.

20. If the mean and variance of a binomial variate are respectively 5 and $\frac{10}{3}$, find its parameters, also draw its p.m.f

21. Write the properties of standard normal distribution.Draw its diagram also mention its application in probability theory

(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. In four tosses of a coin, let X be the number of heads. Tabulate the 16 possible outcomes with the corresponding values of X. And derive the pdf of X and hence calculate the expected value of X

24. Explain binomial and normal distributions with properties

25. The length of human pregnancies from conception to birth approximates a normal distribution with a mean of 266 days and a standard deviation of 16 days.
    i) What proportion of all pregnancies will last between 240 and 270 days
    ii) What length of time marks the shortest 70% of all pregnancies
    iii) What length of time marks the shortest 10% of all pregnancies

(2×15=30)