

### Instructions for attempting paper:

1. Carrying and sharing of Digital Diaries and mobile phones are not allowed in examination.
  2. Attempt all Questions and Provide Clear and Comprehensive Solutions.
  3. Name your Question Papers and return it with your Answer Sheets.
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Q#1. A card is drawn from 52 playing cards with replacement. What is the probability of obtaining two diamonds and three clubs if the experiment is repeated 5 times?

Q#2. Let  $x$  be the random variable given the number of heads minus number of tails in three tosses of a coin. What is the probability distribution of  $x$  if coins are biased so the tail is thrice as likely to occur as head?

Q#3. Suppose the screening test has 1% false positive test and 1% false negative rate. Also suppose that the rate of disease in population is 0.02. what is the probability if the person selected at random is test positive the person has a disease.

Q#4. The weight of large number of miniature poodle is approximately normal with mean of 8kg and standard deviation of 0.9 kg. find fraction of these poodles with weight

- Above 9.5kg
- Between 11.5 and 15.5kg
- Less than 10 kg

Q#5. What is the situations to apply (only to the point answer)

- Hyper geometric to binomial distribution
- Negative binomial to geometric distribution
- Binomial distribution to multinomial distribution
- Normal distribution
- Conditional probability to Bayes theorem

Q#6. The annexation suit is being considered against a country sub division of 1200 residents by a neighboring city. if the occupants if one half of residents object to being annexed what is the probability in a random sample of 15 at least 3 favor the tax?

Q#7. A computer programmer makes 5 percent errors per program. Total 1000 programs are running on heavy device. What is the probability he makes

- At least 3 errors per program
- At most 4 errors

- No error of found in the program.

**Q#8.** A surface of circular dart board has small center circle and 20 pie shaped regions from 1 to 20. each pie shaped is further divided in to three parts such as a person throwing a dart that land on specific number score the value of number double the number or triple the number depending on which three parts the dart falls. If the person hits the bulls eye with the probability of 0.01 hits double with probability of 0.10 and triple with probability of 0.05 and misses the dart board with probability 0.02 what is the probability that 7 throws will result in no bulls eye no triples double twice and a complete miss once?

**Q#9.** A scientist inoculates several mice one at a time with disease germ until he finds two has contracted the disease. If the possibility of contracting the disease is  $1/6$  what is probability 8 mice are required?

**Q#10.** how many ways can 6 people be lined up in a bus? If three people insist to follow each other in how many ways it is possible? If certain two people refuse to follow each other how many ways it is possible?

-----good luck-----