

## Comprehensive Test Series-01

### Probability

TIME: 1.5hr

MM: 60

#### General Instructions:

- All Questions are compulsory.
  - Marks are given along with the questions individually.
  - Use of calculator is not permitted.
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- Q.1 In each of the following describe the sample space for the indicated experiment.  
A coin is tossed four times.
- Q.2 2 boys and 2 girls are in Room X, and 1 boy and 3 girls in Room Y. Specify the sample space for the experiment in which a room is selected and then a person.
- Q.3 The numbers 1, 2, 3 and 4 are written separately on four slips of paper. The slips are put in a box and mixed thoroughly. A person draws two slips from the box. One after the other, without replacement. Describe the sample space for the experiment.
- Q.4 An experiment consists of rolling a die and then tossing a coin once if the number on the die is even. If the numbers on the die is odd, the coin is tossed twice. Write the sample space for this experiment.
- Q.5 A coin is tossed. If it shows a tail, we draw a ball from a box which contains 2 red and 3 black balls. If it shows head, we throw a die. Find the sample space for this experiment.
- Q.6 Two dice are thrown. The events A, B and C are as follows:  
A: getting an even number on the first die.  
B: getting an odd number on the first die.  
C: getting the sum of the numbers on the dice  $\leq 5$ .  
Describe the events
- (i) A and B
  - (ii) A but not C
  - (iii) A or B
  - (iv)  $A \cap B' \cap C'$
- Q.7 Two students Anil and Ashima appeared in an examination. The probability that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probability that both will qualify the examination is 0.02. Find the probability that
- (a) Both Anil and Ashima will not qualify the examination.
  - (b) At least one of them will not qualify the examination and
  - (c) Only one of them will qualify the examination.

- Q.8 A fair coin with 1 marked on one face and 6 on the other and a fair die are both tossed. Find the probability that the sum of numbers that turn up is (i) 3 (ii) 12.
- Q.9 Three coins are tossed once. Find the probability of getting  
(i) atmost 2 heads (ii) at least 2 heads (iii) exactly two tails (iv) atmost two tails
- Q.10 In a lottery, a person chooses six different natural numbers at random from 1 to 20, and if these six numbers match with the six numbers already fixed by the lottery committee, he wins the prize. What is the probability of Winning the prize in the game.
- Q.11 In an entrance test that is graded on the basis of two examinations, the probability of a randomly chosen student passing the first examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing at least one of them is 0.95. What is the probability of passing both?
- Q.12 The probability that a student will pass the final examination in both English and Hindi is 0.5 and the probability of passing neither is 0.1. If the probability of passing the English examination is 0.75, what is the probability of passing the Hindi examination?
- Q.13 In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that  
(i) The student opted for NCC or NSS.  
(ii) The student has opted neither NCC nor NSS.  
(iii) The student has opted NSS but not NCC.
- Q.14 A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn form the box, what is the probability that  
(i) all will be blue? (ii) at least one will be green?
- Q.15 A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine.  
(i)  $P(1 \text{ or } 3)$
- Q.16 Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that  
(a) you both enter the same section?  
(b) you both enter the different sections?
- Q.17 Three letters are dictated to three persons and an envelope is addressed to each of them, the letters are inserted into the envelopes at random so that each envelope contains exactly one letter. Find the probability that at least one letter is in its proper envelope.

Q.18 From the employees of a company, 5 persons are selected to represent them in the managing committee of the company. Particular of five persons are as follows:

S.No.	Name	Sex	Age in years
1.	Harish	M	30
2.	Rohan	M	33
3.	Sheetal	F	46
4.	Alis	F	28
5.	Salim	M	41

A person is selected at random from this group to act as a spokesperson. What is the probability that the spokesperson will be either male or over 35 years?

Q.19 If 4-digit numbers greater than 5,000 are randomly formed from the digits 0,1,3,5, and 7, what is the probability of forming a number divisible by 5 when, (i) the digits are repeated? (ii) the repetition of digits is not allowed?

Q.20. A coin is tossed three times, consider the following events.

A: 'No head appears', B: 'Exactly one head appears' and C: 'Atleast two heads appear'.

Do they form a set of mutually exclusive and exhaustive events?