Probability

IIT Foundation Material

Section - I

Straight Objective Type

This section contains multiple choice questions. Each question has 4 choices (A), (B), (C), (D), out of which **ONLY ONE** is correct. Choose the correct option.

- Two Players, Sangeeta and Reshma, play a tennis match. It is known that the probability of Sangeeta winning the match is 0.62. What is the probability of Reshma winning the match?
 (a) 0.62
 (b) 0.38
 (c) 1
 (d) 0.24
- **2.** Savita and Hanida are friends. What is the probability that both will have different birth days?

(a)
$$\frac{1}{2}$$
 (b) $\frac{2}{3}$ (c) $\frac{364}{365}$ (d) $\frac{365}{364}$

3. In a musical chair game, the person playing the music has been advised to stop playing the music at any time within 2 minutes after she starts plying. What is the probability that the music will stop within first half – minute after starting?

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) 1 (d) $\frac{2}{5}$

4. A missing helicopter is reported to have crashed some where in the rectangular region shown in the figure. What is the probability that it crashed inside the lake shown in the figure?



- **5.** The probability that a number selected at a random from the number 1 to 25 not a prime number when each of the given is equally likely to be selected.
 - (a) $\frac{9}{11}$ (b) $\frac{16}{25}$ (c) $\frac{11}{25}$ (d) $\frac{14}{25}$

6. The probability of throwing an even number with an ordinary six faced die is

(a)
$$\frac{1}{2}$$
 (b) $\frac{1}{3}$ (c) $\frac{4}{5}$ (d) $\frac{1}{7}$

7. The probability of throwing 9 with two dice is

(a)
$$\frac{1}{9}$$
 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) 1

8. A card is drawn at random from a well – shuffled pack of 52 cards. Then the probability that the card drawn is neither a red card nor a queen is

(a)
$$\frac{6}{13}$$
 (b) $\frac{3}{15}$ (c) $\frac{1}{2}$ (d) $\frac{4}{13}$

9. The probability of getting a number less than 5 in a single throw of a die is

(a)
$$\frac{4}{15}$$
 (b) $\frac{2}{3}$ (c) $\frac{5}{13}$ (d) $\frac{1}{52}$

10. If the probability of winning a game is 0.3 then the probability of losing it is

(a) 1 (b) 0.7 (c) 0.6 (d) 0.1

11. Two coins are tossed simultaneously then the probability of getting two heads is

(a)
$$\frac{3}{4}$$
 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 1

12. On tossing three coins t a time then the probability of getting 3 heads is

(a)
$$\frac{1}{8}$$
 (b) $\frac{3}{8}$ (c) $\frac{2}{8}$ (d) $\frac{5}{8}$

13. 1000 tickets of a lottery sold and there are 5 prizes on these tickets.

If saket has purchased one lottery ticket. Then the probability of winning a prize is

(a) 0.005 (b) 0.25 (c) 0.15 (d) 0.05

14. A child has a block in the shape of cube with one letter written on each face as shown below



The cube is thrown once. Then the probability of getting A is

(a)
$$\frac{1}{6}$$
 (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{1}{5}$

15. The bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random. Then the probability that the red ball drawn is

(a)
$$\frac{7}{15}$$
 (b) $\frac{8}{15}$ (c) $\frac{2}{3}$ (d) $\frac{5}{7}$

16. A bag contains 5 red balls, 8 white balls, 4 green balls and 7 black balls. If one ball is drawn at random then the probability that is black.

(a)
$$\frac{7}{24}$$
 (b) $\frac{5}{24}$ (c) $\frac{5}{6}$ (d) $\frac{5}{7}$

17. A card is drawn from a well–shuffled deck of playing cards then the probability of drawing a face cards is

(a)
$$\frac{2}{13}$$
 (b) $\frac{4}{13}$ (c) $\frac{5}{13}$ (d) $\frac{7}{13}$

18. One card is drawn from a well – shuffled deck of 52 cards then the probability of 10 of a block suit is

(a)
$$\frac{1}{13}$$
 (b) $\frac{1}{52}$ (c) $\frac{1}{26}$ (d) $\frac{1}{8}$

19. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball then the number of blue balls in the bag?

20.

mixed thoroughly. One card is drawn from this box then the probability that the number on the card an even number is

(a) $\frac{1}{2}$ (b) $\frac{3}{25}$ (c) $\frac{9}{100}$ (d) $\frac{2}{25} \frac{9}{100}$

SECTION - II Assertion - Reason Questions

This section contains certain number of questions. Each question contains STATEMENT-1 (Assertion) and STATEMENT - 2 (Reason). Each question has 4 choices (a), (b), (c) and (d) out of which **ONLY ONE** is correct. Choose the correct option.

21. STATEMENT-1: In a Class of 12 students, 5 are boys and the rest are girls then the probability that a student will be a girl is $\frac{7}{12}$.

because

STATEMENT-2: Probability of an event Number of favourable outcomes

Total Number of possible outcomes

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is **NOT** a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

22. STATEMENT-1: A die is thrown once then the probability of getting a number 5 or $6 = \frac{1}{3}$

because

STATEMENT-2: The probability of getting '9' on throwing two dice is $\frac{1}{\alpha}$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a

correct explanation for statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is $\ensuremath{\textbf{NOT}}$ a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

23. STATEMENT-1: A die is thrown once then the probability of getting an even number is $\frac{1}{2}$

because

STATEMENT-2: The probability of getting a number between 3 and 6 is $\frac{1}{2}$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is $\ensuremath{\text{NOT}}$ a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

24. STATEMENT-1: In a cricket match with Pakistan, Indian team has to choose a captain out of the following players.

1. Sehwag 2. Dravid 3. Sachin 4. Saurav Ganguly 5. Anil Kumble the probability that Saurav Ganguly will be selected as captain of

team is $\frac{1}{5}$

because

STATEMENT-2: If A and B are mutually exclusive events, so that $A \cap B = \phi$ then $P(A \cup B) = P(A) + P(B)$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is $\ensuremath{\textbf{NOT}}$ a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

25. STATEMENT-1: The sum of the probabilities all elementary

events of an experiment is 1.

because

STATEMENT-2: A Bag contains 6 Black, 7 Red and 2 White balls. A ball is drawn from the bag at random then the probability

that the ball drawn is red is $\frac{7}{15}$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is **NOT** a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

SECTION - III Linked Comprehension Type

This section contains paragraphs. Based upon each paragraph multiple choice questions have to be answered. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE is correct. Choose the correct option.

Paragraph for Question Nos. 26 to 28

26. The probability that the number on the card is a number less than 14

(a)
$$\frac{1}{2}$$
 (b) $\frac{3}{25}$ (c) $\frac{9}{100}$ (d) $\frac{2}{25}$

27. The probability that the number on the card is a number which is a perfect square

(a)
$$\frac{1}{2}$$
 (b) $\frac{3}{25}$ (c) $\frac{9}{100}$ (d) $\frac{2}{25}$

28. The probability that the number on the card is a Prime Number less than 20 is

(a)
$$\frac{1}{2}$$
 (b) $\frac{3}{25}$ (c) $\frac{9}{100}$ (d) $\frac{2}{25}$

Paragraph for Question Nos. 29 to 31

Two dice, one blue and one grey, are thrown at the same time, write down all the possible out come then

29. The probability that the sum of the two numbers appearing on the top of the dice is 8.

(a)
$$\frac{1}{2}$$
 (b) $\frac{5}{36}$ (c) $\frac{1}{4}$ (d) $\frac{1}{8}$

30. The probability that the sum of the two numbers appearing on the top of the dice is 13.

(a)
$$\frac{5}{36}$$
 (b) $\frac{1}{2}$ (c) 0 (d) $\frac{1}{4}$

31. The probability that the sum of the two numbers appearing on the top of the dice is less than or equal to 12.

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$	(a) 1	(c) $\frac{1}{3}$ ((b) $\frac{1}{2}$	(d) $\frac{1}{4}$
---	-------	---------------------	-------------------	-------------------

Paragraph for Question Nos. 32 to 34

There are 5 green, 6 black and 7 white balls in a bag. A ball is drawn at random from the bag then the probability that it may be

32.	For a white ball			
	(a) $\frac{7}{18}$	(b) $\frac{11}{18}$	(c) $\frac{2}{3}$	(d) $\frac{1}{2}$
33.	3. For either a green or black ball			
	(a) $\frac{7}{18}$	(b) $\frac{11}{18}$	(c) $\frac{2}{3}$	(d) $\frac{1}{2}$
34.	For not a black ball			
	(a) $\frac{7}{18}$	(b) $\frac{11}{18}$	(c) $\frac{2}{3}$	(d) $\frac{1}{2}$

Paragraph for Question Nos. 35 to 37

A bag contains 12 balls out of which x are white then

35. If one ball is drawn at random, what is the probability that it will be

a white ball? (a) $\frac{1}{4}$ (b) $\frac{2}{3}$ (c) $\frac{3}{5}$ (d) $\frac{1}{6}$

36. If 6 more white ball are put in bag, the probability of drawing a white ball double that in 35 than the value of *x*?
(a) 3 (b) 4 (c) 5 (d) 7

37. If three balls are drawn at random what is the probability that tall are not white balls?

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{2}{3}$ (d) $\frac{1}{2}$

Paragraph for Question Nos. 35 to 37

An Urn contains 6 oranges, 7 apples and 11 mangoes. A fruit is drawn at random. What is the probability of drawing

38 .	An Orange?			
	(a) $\frac{1}{4}$	(b) $\frac{11}{24}$	(c) $\frac{3}{4}$	(d) $\frac{17}{24}$
39.	A mango?			
	(a) $\frac{1}{4}$	(b) $\frac{11}{24}$	(c) $\frac{3}{4}$	(d) $\frac{17}{24}$
40 .	An apple or a	a mango?		
	(a) $\frac{1}{4}$	(b) $\frac{11}{24}$	(c) $\frac{3}{4}$	(d) $\frac{17}{24}$

SECTION - IV Matrix - Match Type

This section contains Matrix-Match type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in Column I have to be matched with statements (p, q, r, s) in Column II. The answers to these questions have to be appropriately bubbled as illustrated in the following example.

If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-s, then the correctly bubbled matrix should be as follows:

	р	q	r	s
A	\odot	(P)	(r)	۲
B	P	•	\odot	\odot
С	P		\bigcirc	\bigcirc
D	P	(\bigcirc	۲

41.	If A and B are two events then			
	Column I	Column II		
	(a) $P(A \cup B)$	(p) $P(A) + P(B) - P(A \cup B)$		
	(b) P (A)	(q) $P(A \cap B) + P(\overline{A} \cap B)$		
	(c) P(B)	(r) $1 - P(A)$		
	(d) $P(\overline{A})$	(s) $P(A \cap B) + P(A \cap \overline{B})$		

42. One Card is drawn from a well – shuffled deck of 52 cards. Then probability of getting.

Column II

Column I

(a) a king or red colour	(p) $\frac{1}{52}$
(b) a face card	(q) $\frac{1}{26}$
(c) the jack of hearts	(r) $\frac{3}{13}$
(d) The Queen of diamonds	(s) $\frac{3}{26}$

43. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 (See Fig) and these are equally outcomes. What is the probability that it will point at?

