

## UNIT TEST

Duration: 1 hour

Marks: 30

### SECTION A

Each carry 1 mark

1. Two events A and B will be independent if

(a) A and B are mutually exclusive events

(b)  $P(A) = P(B)$

(c)  $P(A'B') = (1 - P(A))(1 - P(B))$

(d)  $P(A) + P(B) = 1$

2. If A and B are events such that  $P(A/B) = P(B/A) \neq 0$ , then:

(a)  $A \subset B$ , but  $A \neq B$

(b)  $P(A) = P(B)$

(c)  $A \cap B = \phi$

(d)  $A = B$

3. If the sum of numbers obtained on throwing a pair of dice is 9, then the probability that number obtained on one of the dice is 4 is:

(a)  $\frac{1}{9}$

(b)  $\frac{4}{9}$

(c)  $\frac{1}{18}$

(d)  $\frac{1}{2}$

4. Assertion (A): Given two independent events A and B such that  $P(A) = 0.3$  and  $P(B) = 0.6$ , then  $P(A \text{ and not } B) = 0.12$ .

Reason(R): For two independent events A and B,  $P(A \text{ and } B) = P(A) \cdot P(B)$ .

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

### SECTION B

Each carry 3 marks

5. Out of outstanding students of a school, there are 4 boys and 5 girls. A team of 4 students is to be selected for quiz competition. Find the probability that two boys and two girls are selected.

6. A couple has 2 children. Find the probability that both are boys, if it is known that (i) one of them is a boy (ii) the older child is a boy.
7. P speaks truth in 70% of the cases and Q in 80% of the cases. In what percent of cases are they likely to agree in stating the same fact? Do you think, when they agree, means both are speaking truth?
8. The probabilities of two students A and B coming to the school in time are  $\frac{3}{7}$  and  $\frac{5}{7}$  respectively. Assuming that the events A coming in time and B coming in time are independent, find the probability of only one of them coming to the school in time.

### **SECTION C**

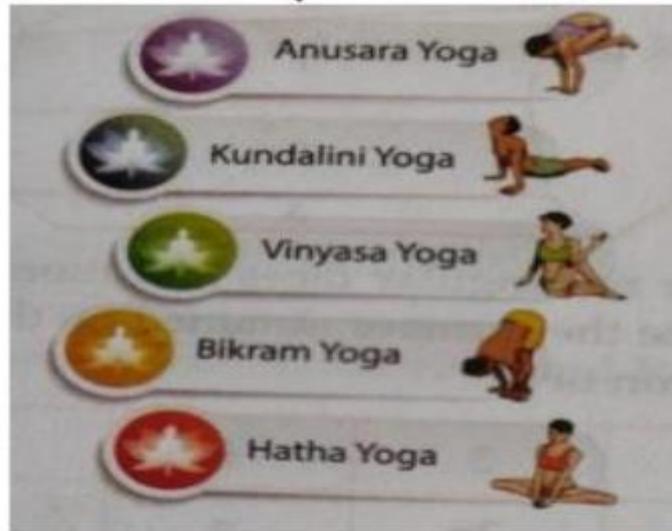
**Each carry 5 marks**

9. An urn contains 7 red and 4 blue balls. Two balls are drawn at random with replacement, Find the probability of getting (a) 2 red balls (b) 2 blue balls (c) one red and one blue ball.
10. In a factory which manufactures bolts, machines A, B and C manufacture respectively 30%, 50% and 20% of the bolts. Of their outputs 3, 4, and 1 percent respectively are defective bolts. A bolt is drawn at random from the product and is found to be defective. Find the probability that this is not manufactured by machine B.

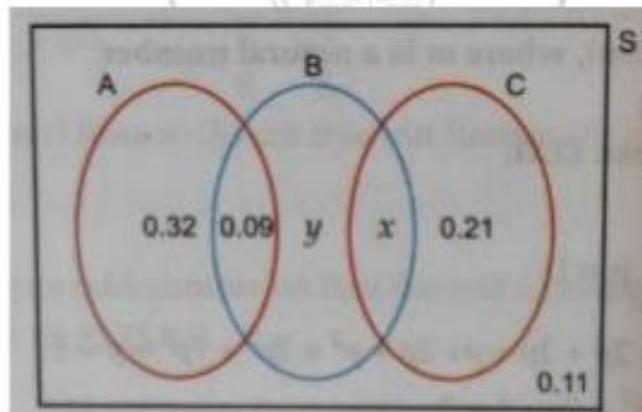
### **SECTION E**

11. Read the following passage and answer the following questions:

There are different types of Yoga which involve the usage of different poses of Yoga Asanas, Meditation and Pranayam as shown in the figure below:



The Venn diagram below represents the probabilities of three different types of Yoga A, B and C performed by the people of a society. Further, it is given that probability of a member performing type C Yoga is 0.44.



- (i) Find the value of  $x$
- (ii) Find the value of  $y$ .
- (iii) Find  $P\left(\frac{C}{B}\right)$ .

(OR)

Find the probability that a randomly selected person of the society does Yoga of type A or B but not C.