Very-Very Short Answer type (1 Mark)

1. A fruit basket contains 8 apples, 5 mangoes and 10 oranges. What is the probability of choosing a mango from the basket.
2. A letter is chosen at random from English alphabets. What is the probability that letter to be one of the letters of the word MATHEMATICS ?
3. The probability of not happening of an event is 0.73. What is the probability of happening of that event ?
4. A die is thrown. What is the probability of getting a multiple of 3 ?
5. What is the probability that diameter of a circle is the longest chord of the circle ?
6. A coin is tossed 200 times. If head appears 120 times what is the probability of getting tail ?
7. What is the sum of the probabilities of happening of an event and not happening of the event ?
8. What is the sum of the probabilities of all the possible events of a random experiment ?
9. What is the probability of getting a prime number on throwing a die ?
10. A coin is tossed once. What is the probability of getting a tail ?
11. A die is tossed once. What is the probability of getting an even number ?
12. A bag contains 2red, 3 green and 1 white ball. What is the probability that the ball picked up is not black ?
13. In the word MATHEMATICS, what is the probability of choosing a vowel?
14. A bag contains slips with numbers between 3 and 32. What is the probability that a slip choosen contains multiple of 4?
15. During an interview for estate manager 15 candidate appeared. Out of which 8 were retired army men, 4 were retired principals and 3 others were from different departments. What is the probability of selecting a retired army man for this post ?
6. A card is drawn at random from a well shuffled pack of 52 cards. Find the probability that the card drawn is a red card.
17. In a bag, there are 100 bulbs out of which 30 are defective ones. A bulb is taken out of the bag at random. Find the probability if the selected bulb to be a good one.
18. A bag contains x white, y blue and z red balls. A ball is drawn at random. Find the probability of drawing a red ball from the bag.
19. What is the range in which probability of an event lie ?
20. In a hockey match, a goalkeeper of a team can stop a goal 7 times out of 10 shots by other team. Find the probability that the team can make a goal.

Fill in the blanks (Ques 21 to 25)

21. Getting a number 11 on throwing a die is _____ event.

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22. On tossing a coin, the possible outcomes are _____ and _____.

23. The probability of an impossible event is _____

24. The probability of happening of an event can never be more than _____

25. The probability of happening of an event is $\frac{3}{4}$ so the probability of not happening of this event is _____

CASE STUDY BASED PROBLEM

26. An insurance company selected 1000 drivers at random in a particular city to find a relationship between age and accidents in a year. The data obtained are given below.



Age group of driver (in years)	Number of Accidents				
	0	1	2	3	more than 3
18-25	212	74	62	34	18
25-40	195	62	45	25	12
40-60	110	45	50	12	7
60 and above	12	8	6	4	7

The probability of the event for a driver selected at random :

(A) being 18-25 years of age and having exactly 2 accident is

(a) 0.034 (b) 0.045 (c) 0.062 (d) 0.110

(B) being 25-40 years of age and having atleast 3 accidents

(a) 0.037 (b) 0.025 (c) 0.012 (d) 0.045

(C) being more than 40 years of age and having no accident

(a) 0.053 (b) 0.012 (c) 0.110 (d) 0.122

(D) having no accident

(a) 0.044 (b) 0.163 (c) 0.189 (d) 0.529

(E) As per the above table, greatest probability of accident falls under the age group of

(a) 18-25 year (c) 40-60 years

(b) 25-40 years (d) 60 year and above

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27. During festival season, a shopkeeper prepares gift packs of dry fruits. The net weights of dry fruits in 10 boxes of gross weight of 5kg each are : 4.798kg, 4.795kg, 4.801kg, 4.805kg, 4.810kg, 4.825kg, 4.798kg, 4.800kg, 4.806kg, 4.817kg. The remaining weight is the weight of the box without dry-fruits.



A box is chosen at random. The probability that its net weight of dry fruits is:

(A) more than 4 kg 800g

(a) 0.7 (b) 0.6 (c) 0.5 (d) 0.4

(B) exactly 4.798 kg

(a) 0.2 (b) 0.3 (c) 0.4 (d) 0.5

(C) more than median weight

(a) 0.48 (b) 0.52 (c) 0.51 (d) 0.5

(D) equal to modal weight

(a) 0.2 (b) 0.3 (c) 0.4 (d) 0.5

(E) A box is selected at random. The probability of selecting a box having weight less than 200 grams without dry fruit is :

(a) 0 (b) 0.6 (c) 0.5 (d) 0.7

28. A sports teacher maintains record of weights of 45 students in a frequency distribution table



Weight (in kg)	No. of students
30-35	8
35-40	6
40-45	16
45-50	9
50-55	3
55-60	1
60-65	0
65-70	2

The probability that the weight of a student selected at random:

(A) lies in the interval 45-50 kg is

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(a) $\frac{2}{15}$ (b) $\frac{1}{5}$ (c) $\frac{1}{15}$ (d) $\frac{2}{45}$

(B) is less than 45kg

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

(C) is almost 49kg

(a) $\frac{13}{15}$ (b) $\frac{12}{15}$ (c) $\frac{2}{15}$ (d) $\frac{1}{15}$

(D) In a particular sport, a player having weight atleast 60kg can participate. The probability that a randomly selected student can participate in the sport is.

(a) $\frac{43}{45}$ (b) 0 (c) $\frac{2}{45}$ (d) 1

(E) In a particular sport, only a student of weight 62 kg can participate. The probability that a randomly selected students can participate in that sport is

(a) $\frac{2}{45}$ (b) 1 (c) 0 (d) $\frac{43}{45}$

Very Short Answer Type (2 marks)

29. Below is the table showing marks secured in mathematics by students of class IX : What is

Marks secured	0-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	0	1	9	10	10	8	5	3	2

i) Probability of getting marks less than 50%

ii) Probability of getting marks 90% & above 90%

30. Cards numbered from 7 to 49 are put in a box & mixed thoroughly. A card is drawn from the box. What is the probability that the number written on it is:

i) A prime number

ii) A multiple of 7.

31. The number of hours spent by Ashu, a school student on various activities on a working day are given below:

Activity	Sleep	school	H.W.	Tuition out of home	Outdoor games	Other Acti. at home
No. of Hours	7	7	2	3	3	2

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His friend Sonu came to his house to study together. What is the probability that

i) Ashu is available at home.

ii) Ashu's friend will play outdoor games with Ashu.

32. The record of a weather station shows that out of the past 250 consecutive days, its weather forecast were correct 175 times. What is the probability that on a given day
(i) It was correct (ii) it was not correct

33. The following data was collected from an old age home about their choices of drink.

Drink	Campa/Soft Drink	Shikanji	Milk	Canned Juice
No. of people	6	10	16	8

A person is selected at random from their old-age home. What is the probability that a person chosen likes.

i) Natural drink

ii) Canned Juice

34. There are 35 students in class IX A, 34 in IX-B & 33 in IX C. The even roll numbers are allotted project on chapter 2, Polynomials & odd roll number are allotted for chapter-1, Number system. What is the probability that the student chosen

i) Prepares project on chapter 1

ii) Prepares project on chapter 2

35. The difference between the probabilities of happening & non happening of an event E is $\frac{3}{7}$. Find the probability of happening of the event E.

36. Following table shows the birth month of 40 students of a class.

Jan	3	July	2
February	4	August	6
March	2	September	3
April	2	October	4
May	5	November	4
June	1	December	4

A students is chosen . What is the probability that

i) its birth month is November

ii) The month contains 31 days.

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SECTION-III

37. The probability of guessing the correct answer to a certain question is $\frac{x}{2}$. If the probability of not guessing the correct answer to the question is $\frac{2}{3}$, then find x.

38. A purse contains a number of ₹1, ₹2 and ₹5 coin as given below :

₹1	₹2	₹5
14	10	14

If from the purse a coin is taken out of random, then find the probability that the coin.

(a) is not a ₹5 coin

(b) is a ₹1 coin

39. A box contains 130 bolts and 70 nuts. On checking the box, it was found that half of the bolts and half of the nuts are rusted. If one of them is chosen at random, find the probability that it is not rusted.

40. A card is drawn at random from a well shuffled pack of 52 cards. Find the probability of drawing

(i) an Ace card (ii) a club card.

41. In a school library, a student find that in a book shelf, there are 30 English books, 20 literature books, 10 hindi books and 25 mathematics books. Find the probability of each book chosen at random. Find the sum of all probabilities.

42. A die is thrown 100 times. If the probability of getting an odd number is $\frac{3}{5}$,how many times an even number is obtained ?

Short Answer Type (3 Marks)

43. After a medical check up for HB level of 35 students of class IX , the following data was recorded.

HB Level	Below 8	Below 10	Below 12	Below 14	Below 16
No. of Students	3	7	13	23	35

What is the probability that a student choosen has

i) HB level less than 10.

ii) HB level greater than or equal to 12 but less than 16.

44. To know the opinion of 35 students about sixth subject as automobile engineering or financial management a survey was done. The data is recorded in the following table in favour of choosing automobile engineering

No of student like	20
Dislike	15

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Find the probability that a student will opt.

i) automobile engineering

ii) Financial management

45. A die is thrown 100 times by a player during a game. The data is recorded in the table given below.

Outcome	1	2	3	4	5	6
Frequency	20	12	18	19	16	15

A Player will get one more chance if he gets 1 or 6 & looses his/her next chance if 3 or 5 comes.

i) What is the probability of loosing the next chance?

ii) What is the probability of getting one more chance?

46. Following is the table showing marks obtained by 200 students out of 100 in an examination.

Marks	No. of Students
0-10	20
10-20	40
20-30	15
30-40	24
40-50	25
50-60	12
60-70	9
70-80	7
80-90	12
90-100	36

Find the probability that a student chosen.

i) Obtained less than 40 marks.

ii) Obtained greater than or equal to 60 but less than 80 marks.

iii) Obtained 80 & above marks.

47. Mathematics book of class IX contains 15 chapters. A maths teacher asked one of the students to write the name of each chapter on slips, One name on one slip. She mixed the slips thoroughly in a box.

She called a student to pick up one of the slips. What is the probability that the chapter written on it is from

(i) Geometry (ii) Algebra

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48. A book of mathematics contains 400 pages numbered from 1-400 A page is selected at random. What is the probability that the page number contains.

i) 9 at one's place.

ii) multiple of 4

iii) perfect square

49. The following table shows per day salary of 1000 workers.

Salary Per Day (I)	500-700	701-900	901-1100	1101-1300
No. of Workers	280	175	420	125

If a worker is chosen at random, find the probability that he is getting.

i) at least ₹ 701 daily

ii) at most ₹ 900 daily

iii) at most ₹ 1300 daily

50. $\text{BMI} = \dfrac{\text{Mass in Kg.}}{(\text{height in metres})^2}$

The following table shows the BMI of different categories.

S.No.	Category	BMI (kg/m2)
1.	Under weight	16.0-18.5
2.	Normal weight	18.5-25.0
3.	Over weight	25.0-30.0
4.	Obesity	Above 30.0

Three persons x, y,z have the same height 170 cm and their masses are 70 kg., 85 kg. & 65 kg. respectively.

Find the probability that a person chosen is overweight.

51. Read the lines carefully

Horse is horse, of course, of course.

And no one can talk to horse of course.

That is, of course, unless the horse is the famous mister ID.

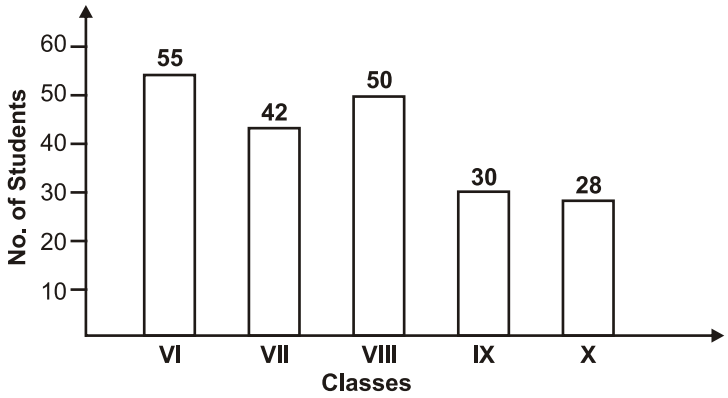
(i) Find the probability of the word 'course' from the above stanza.

(ii) Name the word which has the same probability as the word 'course' has.

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52. The bar graph below shows the number of students in different classes of a school.



In the annual function of primary classes, class IX & X was deputed for discipline duty, students of class VII & VIII for sitting, class VI students were to welcome the chief guests.

Find the probability that a student chosen is

i) Deputed for sitting

ii) a student of class X.

iii) member of welcome committee.

53. In a park, there is a right angled triangular flower bed. It's two small sides are 5m & 12m respectively. Along its all sides at a distance of 1/2m each, plants of different types are to be planted. Rose plants are to be planted along the shortest side, Marigold plants are to be planted along the longest side & sunflower plant along the third side. At each of the vertex a different type of flower plant is to be planted. A plant is chosen at random. Find the probability that the chosen plant is

(i) On the longest side.

(ii) Sun flower plants.

54. Out of 1000 small coloured bulbs $81^{3/2}$ are of white colour. 5^3 are red coloured, 2^6 are green coloured & rest are blue coloured. What is the probability that bulb chosen is.

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(i) blue coloured

(ii) red coloured.

(iii) white coloured.

55. In a school there are 682 students. The mode of transport used by them is as follows:

Mode of Transport	Car with Parents	Bicycle	Pedestrian	DTC Bus	Bike with Parents	Van	Auto rickshaw
No. of Students	64	52	128	100	86	172	80

A student is chosen at random. What is the probability that he comes by:

(i) Four wheeler

(ii) Two wheeler

56. Cards with number 1, 2, 3 ----- 100 are placed in a box and mixed throughly. One card is drawn. What is the probability that the card drawn is

(i) a multiple of 5 or 7?

(ii) a multiple of 5 and 7?

(iii) a prime number less than 20?

57. The blood groups of 20 students of a class are recorded as below.

B, A, B, O, AB, O, A, AB, O, B, B, AB, AB, O, A, O, A, B, AB and O.

A student is selected at random. Find the probability that his blood group is

(i) A (ii) AB (iii) O

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PROBABILITY

Hints and Solutions/ Answer

1. $\frac{5}{23}$
2. $\frac{4}{13}$
3. 0.27
4. $\frac{1}{3}$
5. 1
6. $\frac{2}{5}$
7. 1
8. 1
9. $\frac{1}{2}$
10. $\frac{1}{2}$
11. $\frac{1}{2}$
12. 1
13. $\frac{4}{11}$
14. $\frac{7}{28}$
15. $\frac{8}{15}$
16. $\frac{1}{2}$
17. $\frac{7}{10}$
18. $\frac{z}{x+y+z}$
19. 0 to 1
20. $\frac{3}{10}$
21. impossible
22. head, tail
23. 0
24. 1
25. $\frac{1}{4}$
26. (A) (c) 0.062
    (B) (a) 0.037
    (C) (d) 0.122
    (D) (d) 0.529
    (E) (a) 18-25 years
27. (A) (b) 0.6
    (B) (a) 0.2
    (C) (d) 0.5
    (D) (a) 0.2
    (E) (b) 0.6
28. (A) (b) $\frac{1}{5}$
    (B) (a) $\frac{2}{3}$
    (C) (a) $\frac{13}{15}$
    (D) (c) $\frac{2}{45}$
    (E) (c) 0
29. (i) $\frac{5}{12}$
    (ii) $\frac{1}{24}$
30. (i) $\frac{12}{43}$
    (ii) $\frac{7}{43}$
31. (i) $\frac{11}{24}$
    (ii) $\frac{1}{8}$
32. (i) $\frac{7}{10}$
    (ii) $\frac{3}{10}$
33. (i) $\frac{13}{20}$
    (ii) $\frac{1}{5}$
34. (i) $\frac{26}{51}$
    (ii) $\frac{25}{51}$
35. $\frac{5}{7}$
36. (i) $\frac{1}{10}$
    (ii) $\frac{7}{12}$
37. $\frac{x}{2}+\frac{2}{3}=1$
    $x=\frac{2}{3}$

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38. (i) $\frac{12}{19}$

(ii) $\frac{7}{19}$

39. $\frac{1}{2}$

40. (i) $\frac{1}{13}$

(ii) $\frac{1}{4}$

41. $\frac{6}{17}, \frac{4}{17}, \frac{2}{17}, \frac{5}{17}$

sum of probabilities

$= \frac{6}{17}+\frac{4}{17}+\frac{2}{17}+\frac{5}{17}$

$= \frac{17}{17}$

$= 1$

42. $\frac{2}{5}$ x100=40

43. (i) $\frac{1}{5}$

(ii) $\frac{22}{35}$

44. (i) $\frac{4}{7}$

(ii) $\frac{3}{7}$

45. (i) $\frac{17}{50}$

(ii) $\frac{7}{20}$

46. (i) $\frac{99}{200}$

(ii) $\frac{2}{25}$

(iii) $\frac{6}{25}$

47. (i) $\frac{7}{15}$

(ii) $\frac{2}{15}$

48. (i) $\frac{1}{10}$

(ii) $\frac{1}{4}$

(iii) $\frac{1}{20}$

49. (i) $\frac{18}{25}$

(ii) $\frac{91}{200}$

(iii) 1

50. $\frac{1}{3}$

51. (i) $\frac{1}{7}$

(ii) Horse

52. (i) $\frac{92}{205}$

(ii) $\frac{28}{205}$

(iii) $\frac{11}{41}$

53. (i) $\frac{5}{12}$

(ii) $\frac{23}{60}$

54. (i) $\frac{41}{500}$

(ii) $\frac{1}{8}$

(iii) $\frac{729}{1000}$

55. (i) $\frac{118}{341}$

(ii) $\frac{69}{341}$

56. (i) $\frac{8}{25}$

(ii) $\frac{1}{50}$

(iii) $\frac{2}{25}$

57. (i) $\frac{1}{5}$

(ii) $\frac{1}{4}$

(iii) $\frac{3}{10}$

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PRACTICE TEST

Time : 1 hr. **Probability** M.M. 25

1. What is the probability that a number selected from the number 1, 2, 3, ... 15 is a multiple of 4? 1
2. What is the probability of a sure event. 1
3. In a throw of a die, find the probability of getting a prime number. 1
4. A letter of english alphabet is chosen at random calculate the probability that letter chosen in a vowel. 2
5. A bag contains cards numbered from 1 to 100. A card is drawn at random from the bag. Find the probability that the 2
   (i) Card bears a number which is multiple of 5.
   (ii) Card bears a number which is greater than or equal to 80.
6. The probability of guessing the correct answer to a certain question is $\frac{x+1}{5}$.
   If the probability of not guessing the correct answer is $\frac{x}{5}$ then find value of x. 2
7. A card is drawn at random from a well - shuffled pack of 52 cards. Find the probability of drawing. 3
   (a) a club card
   (b) not a spade card
   (c) king card.
8. A die is thrown 400 times with the frequencies for the outcomes 1, 2, 3, 4, 5 and 6 as given in table. 3

Outcomes	1	2	3	4	5	6
Frequency	72	65	70	71	63	59

   Find the probability of
   (i) getting a number less than 3
   (ii) getting an outcome 6
   (iii) getting a number more than 4.
9. In a one day international cricket match, a batsman play 50 balls. The run scored as follows. 5

Run Scored	0	1	2	3	4	5	6
No. of Balls	13	11	09	07	06	00	04

   Find the probability that batsman will score
   (a) 6 runs (b) 4 or 6 runs (c) Runs less than 2 (d) 3 runs

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10. Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes. 5

Outcomes	3 head	2 head	1 head	No head
Frequency	23	72	77	28

Find the probability of getting :

(a) Two heads

(b) Three heads

(c) Atleast two heads

(d) Atmost two heads

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