## QB365 <br> Model Question Paper 3

9th Standard CBSE
Mathematics
Reg.No.:

|  |  |  |  |  |  |
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Time : 02:00:00 Hrs

Total Marks : 100

## Section-A

1) Area of a triangle $=$
(a) $\frac{1}{2} \times$ Base $\times$ Height
(b) Base $\times$ Height
(c) $\frac{1}{3} \times$ Base $\times$ Height
(d) $\frac{1}{4} \times$ Base $\times$ Height
2) The base and hypotenuse of a right triangle are respectively 6 cm and 10 cm long.Its area is
(a) $60 \mathrm{~cm}^{2}$
(b) $120 \mathrm{~cm}^{2}$
(c) $30 \mathrm{~cm}^{2}$
(d) $24 \mathrm{~cm}^{2}$
3) Heron's formula is
(a) $\Delta=\sqrt{s(s+a)(s+b)(s+c)}$ (b) $\Delta=\sqrt{s(s-a)(s-b)(s-c)} \quad$ (c) $\Delta=\sqrt{s(s-a)(s-b)(s-c)}, \mathrm{s}=\mathrm{a}+\mathrm{b}+\mathrm{c}$
(d) $\Delta=\sqrt{s(s-a)(s-b)(s-c)}, 2 \mathrm{~s}=\mathrm{a}+\mathrm{b}+\mathrm{c}$
4) The area of a triangle whose sides are $13 \mathrm{~cm}, 14 \mathrm{~cm}$, and 15 cm is
(a) $42 \mathrm{~cm}^{2}$
(b) $86 \mathrm{~cm}^{2}$
(c) $84 \mathrm{~cm}^{2}$
(d) $100 \mathrm{~cm}^{2}$
5) The sides of a triangular plot are in the ratio $4: 5: 6$ and its perimeter is 150 cm .Then the sides are
(a) $4 \mathrm{~cm}, 5 \mathrm{~cm}, 6 \mathrm{~cm}$
(b) $40 \mathrm{~cm}, 50 \mathrm{~cm}, 60 \mathrm{~cm}$
(c) $8 \mathrm{~cm}, 10 \mathrm{~cm}, 12 \mathrm{~cm}$
(d) $120 \mathrm{~cm}, 150 \mathrm{~cm}, 180 \mathrm{~cm}$
6) The side of a square is 5 cm . Its perimeter is
(a) 5 cm
(b) 20 cm
(c) 25 cm
(d) 10 cm .
7) Which of the following is a solid figure?
(a) Circle
(b) Cylinder
(c) Square
(d) Rectangle.
8) The side of a cube is 1 cm . The total surface area of the figure formed by joining two such cubes is
(a) $2(2+1+2) \mathrm{cm}^{2}$
(b) $2(2+2+2) \mathrm{cm}^{2}$
(c) $2(1+1+1) \mathrm{cm}^{2}$
(d) $2(1+1+2) \mathrm{cm}^{2}$
9) When the information is gathered from a source which already had the information stored, the data obtained is called
(a) Primary data
(b) Secondary data
(c) Useless data
(d) fictitious data
10) If the range of a distribution is 50 and class interval is 10 , then two number of classes is
(a) 6
(b) 10
(c) 5
(d) 4
11) In the following frequency distribution, what is the frequency of the variable 13 ?
(a) 3
(b) 4
(c) 6
(d) 5 .
12) In a morning walk, I had 20 rounds of a park. During this period, I came across person $A$, person $B$, person $C$ and person D, 11 times, 7 times. 10 times and 5 times respectively. I want to represent this data gra[phically, which of the following is the best representation?
(a) Bar graph
(b) Histogram with unequal width
(c) Histogram with equal width
(d) Frequency polygon
13) The ages (in years) of 10 children are given below $15,15,16,16,15,14,17,16,14,16$. The modal age of the children is:
(a) 4
(b) 15
(c) 16
(d) 17
14) Let $m$ be the mid value and I be the upper limit of a class in a frequency distribution. The lower limit of the class is:
(a) $2 m+1$
(b) $2 \mathrm{~m}-\mathrm{l}$
(c) $\mathrm{m}-\mathrm{l}$
(d) $m-2 l$
15) Marks o four students in statistics are $53,75,42,70$. The arithmetic mean of their marks is
(a) 42
(b) 64
(c) 60
(d) 56 .
16) If the mean of $3,4,8,5, x, 3,2,1$ is 4 , then the value of $x$ is
(a) 2
(b) 4
(c) 6
(d) 8
17) The mean of $x_{1}, x_{2}$ is 6 and mean of $x_{1}, x_{2}, x_{3}$ is 7 . The value of $x_{3}$ is:
(a) 7
(b) 8
(c) 9
(d) 10
18) The median of the data $5,8,7,6,11,13,12,15$ is
(a) 9
(b) 8.5
(c) 11
(d) 9.5
19) In data of 12 members arranged in ascending order, if the 9 th observation is increased by 5 , then median increases by:
(a) 0
(b) 4
(c) 5
(d) 6
20) If $A$ and $B$ are the only two outcomes of an event and $P(A)=0.32$, then value of $P(B)$ would be:
(a) 0.38
(b) 0.68
(c) 0.78
(d) 0.32

## Section-B

21) Find the area of an equilateral triangle of side 10 cm .
22) Find the area of an isosceles triangle with two equal sides as 5 cm each and unequal side as 8 cm .

23) Find the area of the quadrilateral $A B C D$ where $A B=7 \mathrm{~cm}, B C=6 \mathrm{~cm}, C D=12 \mathrm{~cm}, D A=15 \mathrm{~cm}$ and $A C=9 \mathrm{~cm}$.
24) A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are $26 \mathrm{~cm}, 28$ cm and 30 cm , and the parallelogram stands on the base 30 cm , find the height of the parallelogram.
25) Three cubes are placed adjacent to each other in a row. Find the ratio of the total surface area of the cuboid so formed and that of anyone of these cubes.
26) The dimensions of a rectangular box are in the ratio $2: 3: 4$ and difference between the cost of covering it with sheet of paper at the rate of Rs. 4 and Rs. 4.50 per m $^{2}$ is Rs. 416 . Find the dimensions of the box.
27) The height of a right circular cylinder is 15 cm . Its curved surface area is $660 \mathrm{~cm}^{2}$. Find the radius of its base.
28) A cylindrical tower is 5 m in diameter and 14 m high. Find the cost of white-washing its curved surface at Rs 10 per square metre.
29) The total surface area of a cylinder of radius 7 cm is $880 \mathrm{~m}^{2}$. Find the height and the volume of the cylinder.
30) The volume of a cone of base radius 3 cm is $12 \pi \mathrm{~cm}^{2}$, Find the slant height of the cone.
31) Find the volume of a right circular cone whose slant height is 13 cm and the diameter of the base is 10 cm .
(Take $\quad \pi=3.14)$
32) The marks obtained out of 75 by 30 students of a class in an examination are given below:
$42,21,50,37,42,37,38,42,49,52,38,53,57,47,29,59,61,33,17,17,39,44,42,39,14,7,27,19,54,51$
Prepare a frequency distribution table in which the size of class intervals is the same and one class intervalis 0 10.
33) 5 people were asking about the time in a week they spend in doing social work in their community. They said $10,7,13,20$ and 15 hours, respectively. Find the mean (or average) time in a week denoted by them social work
34) 10 numbers $8,11,15,19, x+1,2 x-13,28,31,40,41$ are written in ascending order. If the median is 24 , find $x$.
35) Find the mode of the following marks (out of 10 ) obtained by 20 students:

4,6,5,9,3,2,7,7,6,5,4,9,10,10,3,4,7,6,9,9.
36) The mean of 100 observations is 60 . If one observation of 50 is replaced by 110 , then what will be the new mean?
37) The mean of observations is 50 . If the observation 50 is replaced by 140 , what will be the new mean of the observations?
38) A coin is tossed 1000 times with the following frequencies:

Head: 455, Tail: 545
Compute the probability for each event
39) A die is thrown. Find the probability of getting an odd number.
40) An insurance company selected 2000 drivers at random (i.e., without any preference of one driver over
another) in a particular city to find a relationship between age arid accidents. The data obtained are given in the following table:

| Age of drivers <br> (in years) | Accidents in one year |  |  |  |  |
| :--- | ---: | :--- | ---: | :--- | :--- |
|  | 0 | 1 | 2 | 3 | over 3 |
| $18-29$ | 440 | 160 | 110 | 61 | 35 |
| $30-50$ | 505 | 125 | 60 | 22 | 18 |
| Above 50 | 360 | 45 | 35 | 15 | 9 |

Find the probabilities of the following events for a driver chosen at random from the city:
(i) being 18-29 years of age and having exactly 3 accidents in one year.
(ii) being 30--50 years of age and having one or more accidents in a year.
(iii) having no accidents in one year

## Section-C

41) In the following figure, calculate the area of the shaded portion:

42) The external and internal diameters of a hollow hemi-spherical vessel are 16 cm and 12 cm respectively. The cost of painting 1 sq. cm of surface is Rs 2 . Find the cost of painting the vessel all over. $\left(\pi=\frac{22}{7}\right)$
43) Draw a histogram representing the following frequency distribution:

| Marks | No. of students |
| :---: | :---: |
| $0-10$ | 3 |
| $10-20$ | 5 |
| $20-30$ | 8 |
| $30-40$ | 10 |
| $40-50$ | 7 |
| $50-60$ | 2 |

44) Find the mean of the following marks of 20 students on a screeningtest. (out of 100)
$76,44,45,87,71,72,82,83,41,32,75,32,46,78,17,70,84,12,77,74$
45) The mean of 200 items was 50. Later on, it was discovered that the two items were misread as 92 and 8 instead of 192 and 88 . Find the correct mean.
46) A survey of 500 families was conducted to know their opinion about a particular detergent powder. If 375 families liked the detergent powder and the remaining families disliked it, find the probability that a family chosen at random
(i) likes the detergent powder
(ii) does not like it.
47) Cards marked with numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is
(a) a number less than 14
(b) a number which is a perfect square
(e) a prime number less than 20

15-44 (in years) worldwide, found the following figures (in \%):

| S.No. | Causes | Female fatality rate (\%) |
| :---: | :---: | :---: |
| 1. | Reproductive health conditions | 31.8 |
| 2. | Neuropstchiatric conditions | 25.4 |
| 3. | Injuries | 12.4 |
| 4. | Cardiovascular conditions | 4.3 |
| 5. | Respiratory conditons | 4.1 |
| 6. | Other causes | 22.0 |

(i) Represent the information given above graphically.
(ii) Which condition is the major cause of women's ill health and death worldwide?
(iii) Try to find out, with the help of your teacher, any two factors which play a major role in the cause in (ii) above being the major cause.

## 

## Section-A

1) (a) $\frac{1}{2} \times$ Base $\times$ Height
2) (d) $24 \mathrm{~cm}^{2}$
3) (d) $\Delta=\sqrt{s(s-a)(s-b)(s-c)}, 2 \mathrm{~s}=\mathrm{a}+\mathrm{b}+\mathrm{c}$
4) (c) $84 \mathrm{~cm}^{2}$
5) (b) $40 \mathrm{~cm}, 50 \mathrm{~cm}, 60 \mathrm{~cm}$
6) (b) 20 cm
7) (b) Cylinder
8) (a) $2(2+1+2) \mathrm{cm}^{2}$
9) (b) Secondary data
10) (c) 5
11) (a) 3
12) (a) Bar graph
13) (c) 16
14) (b) $2 m-l$
15) (c) 60
16) (c) 6
17) (c) 9
18) (d) 9.5
19) (a) 0
20) (b) 0.68

## Section-B

21) $25 \sqrt{3} \mathrm{~cm}^{2}$
22) $12 \mathrm{~cm}^{2}$
23) $74.97 \mathrm{~cm}^{2}$
24) 11.2 cm
25) $7: 3$
26) $8 \mathrm{~m}, 12 \mathrm{~m}, 6 \mathrm{~m}$
27) 7 cm
28) Rs 2200
29) $13 \mathrm{~cm}, 2002 \mathrm{~cm}^{3}$
30) 4 cm
31) $314 \mathrm{~cm}^{3}$
32) Class Frequency

| $0-10$ | 1 |
| :---: | :---: |
| $10-20$ | 4 |
| $20-30$ | 3 |
| $30-40$ | 7 |
| $40-50$ | 7 |
| $50-60$ | 7 |
| $60-70$ | 1 |
| Total | 30 |

33) 13 hours.
34) 20
35) 9
36) 60.6
37) 54.5
38) Probability of getting head $=\frac{255}{1000}=\frac{91}{200}$

Probability of getting tail $=\frac{109}{200}$
39) $\begin{aligned} & \frac{1}{2} \\ & \text { 40) } \begin{array}{lll}\text { (i) } \frac{61}{2000} & \text { (ii) } \frac{225}{2000} \approx 0.113 & \text { (iii) } 0.6525\end{array}\end{aligned} l=\begin{aligned} & \text { ( }\end{aligned}$
41) In right triangle PSQ, PQ $\frac{1}{2} 2=P S 2+\mathrm{QS} 2$ |By Pythagoras Theorem

$$
\begin{aligned}
& =(12)^{2}+(16)^{2} \\
& =144+256=400
\end{aligned}
$$

$\Rightarrow \quad \mathrm{PQ}=\sqrt{400}=20 \mathrm{~cm}$
Now, for $\triangle \mathrm{PQR}$

$$
a=20 \mathrm{~cm}, b=48 \mathrm{~cm}, \mathrm{c}=52 \mathrm{~cm}
$$

$\therefore \quad s=\frac{a+b+c}{2}=\frac{20+48+52}{2}=60 \mathrm{~cm}$
$\therefore$ Area of $\triangle \mathrm{PQR}=\sqrt{s(s-a)(s-b)(s-c)}$

$$
\begin{aligned}
& =\sqrt{60(60-20)(60-48)(60-52)}=\sqrt{(60)(40)(12)(8)} \\
= & \sqrt{(6 \times 10)(4 \times 10)(6 \times 2)(8)} \\
= & 6 \times 10 \times 8=480 \mathrm{~cm}^{2}
\end{aligned}
$$

Area of ${ }_{\Delta} \mathrm{PSQ}=\frac{1}{2} \times$ Base $\times$ Altitude

$$
=\frac{1}{2} \times 16 \times 12=96 \mathrm{~cm} 2
$$

$\therefore$ Area of the shaded portion =Area of $\triangle \mathrm{PQR}$ - Area of $\triangle \mathrm{PSQ}$

$$
=480-96=384 \mathrm{~cm}^{2}
$$

42) 

External radius $(\mathrm{R})=\frac{16}{2} \mathrm{~cm}=8 \mathrm{~cm}$
Internal radius $(\mathrm{r})=\frac{12}{2} \mathrm{~cm}=6 \mathrm{~cm}$
$\therefore$ Total surface area
$=2 \pi R^{2}+2 \pi r^{2}+\pi\left(R^{2}-r^{2}\right)=2 \pi(8)^{2}+2 \pi(6)^{2}+\pi\left(8^{2}-6^{2}\right)=128 \pi+72 \pi+28 \pi=228 \pi=228 \times \frac{22}{7} \mathrm{~cm}^{2}$
$\therefore$ Cost of painting

$$
=\operatorname{Rs}_{228} \times \frac{22}{7} \times 2=\operatorname{Rs} 1433.14
$$

43) 


$=\frac{76+44+45+87+71+72+82+83+41+32+75+32+46+78+17+70+84+12+77+74}{20}$
$=\frac{1198}{20}=59.9$
45) $\therefore$ Mean of 200 items $=50$
$\therefore \quad$ Sum of items $=200 \times 50=10000$
Corrected sum $=10000-(92+8)+(192+88)$

$$
=10180
$$

$\therefore \quad$ Correct mean $=\frac{10180}{200}=50.9$
46) $\mathrm{P}($ likes the detergent $)=\frac{375}{500}$
$=\frac{3}{4}$
(ii) P (does not like the detergent)
$=1-\mathrm{p}($ likes the detergent $)$
$=1-\frac{3}{4}=\frac{1}{4}$
47) Total number of cards in the box $=100$
(a) Numbers less than 14 are $2,3,4,5,6,7,8,9,10,11,12,13$

Their number $=12$
Probability that the number on the card is a number less than 14

$$
=\frac{12}{100}=\frac{3}{25}
$$

(b) Perfect square numbers are $4,9,16,25,36,49,64,81,100$

Their number $=9$
Probability that the number on the card is a number which is a perfect square

$$
=\frac{9}{100}
$$

(c) Prime numbers less than 20 are 2,3,5,7,11,13,17,19

Their number $=8$
Probability that the number on the card is a prime number less than 20
$=\frac{8}{100}=\frac{2}{25}$
48) (i)

(ii) Reproduce health conditions is the major cause of women's ill health and death worldwide.
(ii) Lack of proper diet, lack of advised exercises.

