

Session- 2020-21 ,PRACTICE PAPER
CLASS-X
Subject- Mathematics (Standard)

Time Allowed: 3 Hours

Maximum Marks: 80

General Instructions: 1. This question paper contains two parts A and B. 2. Both Part A and Part B have internal choices.

Part – A:

1. It consists of two sections- I and II.
2. Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.
3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

Part – B:

1. Question No 21 to 26 are Very short answer Type questions of 2 mark each
2. Question No 27 to 33 are Short Answer Type questions of 3 marks each
3. Question No 34 to 36 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks

PART- A

Section I

Q1) If $X.Y=180$ and $HCF(X,Y)=3$, find the LCM (X,Y).

OR

After how many places will the decimal expansion of $15/1600$ will terminate.

Q2) Which term of the given AP 2,-1,-4,-7 is -40?

Q3) Write the zeroes of the polynomial $p(x)= 4x^2 + 8x$.

OR

If 3 and -4 are the zeroes of the polynomial, find the quadratic polynomial.

Q4) The probability that it will rain tomorrow is 0.75. What is the probability that it will not rain tomorrow ?

Q5) Which term of the AP 27,24,21.... Is zero?

OR

In an AP if $d= -4$, $n=7$ and n^{th} term is 4 then find a.

Q6) ΔABC similar to ΔDEF such that $AB=9.1\text{cm}$, $DE=6.4\text{cm}$. If the perimeter of ΔDEF is equal to 25cm find the perimeter of triangle ABC.

Q7) Find the ratio in which point P(1,2) divides the join of A(-2,1) and B(7,4).

Q8) If the median of the data 6,7,x-2,x,17,20 written in ascending order is 16 find the value of x.

OR

If $\sum f_i$ is the sum of frequency of first 10 natural number and $\sum fix_i=120$, find mean.

Q9) If $\tan^2 45 - \cos^2 30 = x \sin 30 \cos 60$ find the value of x .

Q10) In triangle ABC if $AB = 6\sqrt{3}$ and $AC = 12$ cm and $BC = 6$ cm find the measure of angle B.

Q11) Find the value of $(1 - \tan^2 45)/(1 + \tan^2 45)$.

OR

If $\operatorname{cosec} A = 2$ find the value of $\left(\frac{1}{\tan A} + \frac{\sin A}{1 + \cos A}\right)$

Q12) Mean of 6, $6+2x$, 5 and $8+3x$ is 20 find the value of x .

Q13) What is the distance between the points A ($a+b$, $a-b$) and B($a-b$, $-a-b$)?

Q14) A metallic sphere of radius is 4.2 cm is melted and recast into the shape of a cylinder of radius is 6 cm find the height of the cylinder.

Q15) Two poles of height 6 m and 11 m stand on a plain ground. If the distance between the feet of the poles is 12 m find the distance between their tops.

Q16) If ABC is isosceles triangle with $AC = BC$. If $AB^2 = 2AC^2$ show that triangle ABC is right angled at C.

SECTION II

Q17) Case study I : Angle of depression

A man standing at the top of a tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60° and distance between tower and car is 5 m.

a) Find the height of the tower

- (i) $5\sqrt{3}$ m (ii) $6\sqrt{3}$ m (iii) 5 m (iv) 6 m

b) Find the distance between the two positions of the car

- (i) 8 m (ii) 9 m (iii) 10 m (iv) 11 m

c) Find the further time taken by the car to reach the foot of the tower

- (i) 2 sec (ii) 3 sec (iii) 5 sec (iv) 4 sec

d) If we interchange the position of angles, it will be logically correct

- (i) Yes (ii) No (iii) Can't say (iv) None of these

e) Find the distance from observer to the car, in which it makes an angle of 60°

- (i) 10 m (ii) 9 m (iii) 8 m (iv) 11 m

Q18) Case study II : Bridge Game

In a bridge game, there are four persons play and make a pair of two-two persons as a partner. In a deck of 52 playing cards, distributed around the table clockwise in such a way that each person get 13 cards

(a) Find the probability that the card drawn is a queen of black colour

(i) $\frac{25}{26}$ (ii) $\frac{3}{26}$ (iii) $\frac{1}{26}$ (iv) $\frac{5}{26}$

(b) Find the probability that the card drawn is a card with no. 5 or 6

(i) $\frac{2}{13}$ (ii) $\frac{11}{13}$ (iii) $\frac{1}{13}$ (iv) $\frac{12}{13}$

(c) Find the probability that the card drawn is a card with no. less than 8

(i) $\frac{6}{13}$ (ii) $\frac{5}{13}$ (iii) $\frac{7}{13}$ (iv) $\frac{3}{13}$

(d) Find the probability that the card drawn is a card with number between 2 and 9

(i) $\frac{7}{13}$ (ii) $\frac{5}{13}$ (iii) $\frac{6}{13}$ (iv) $\frac{3}{13}$

(e) What is the probability to get a face card ?

(i) $\frac{3}{52}$ (ii) $\frac{3}{13}$ (iii) $\frac{4}{13}$ (iv) $\frac{4}{52}$

Q 19) Case study III : Horse tied with Peg

A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5m long rope . Due to this a horse can graze only one particular corner of the field.

(take $\pi = 3.14$)

(a) Find the area of the field

(i) 220 m^2 (ii) 225 m^2 (iii) 227 m^2 (iv) 229 m^2

(b) Choose the correct formula for determining the area of the sector of a circle

(i) $\frac{\phi}{360^\circ} \pi r^2$ (ii) $\frac{\phi}{180^\circ} \pi r^2$ (iii) $\frac{5\phi}{360^\circ} \pi r^2$ (iv) None of these

(c) Find the area of the part of the field in which a horse can graze

(i) 19.625 m^2 (ii) 19.8 m^2 (iii) 18.7 m^2 (iv) 19.3 m^2

(d) Find the increase in the grazing area if the rope were 10 m long instead of 5 m

(i) 58.875 m^2 (ii) 58 m^2 (iii) 58.5 m^2 (iv) 58.7 m^2

(e) Find the arc length of the circle

(i) 7.4 m (ii) 7.3 m (iii) 7.85 m (iv) 7.95 m

Q 20) Case study IV : Students Studying in Class Room

In a mathematics class, a teacher explain the concept for determine the mean by defining the

$$\text{formula Mean}(\bar{x}) = \frac{\sum fixi}{\sum fi}$$

Further,a teacher give one example for explaining above concept

The marks obtained by 30 students of class of class IX of a school in a Mathematics paper consisting of 100 marks are presented in a table given below

Class Interval	10-25	25-40	40-55	55-70	70-85	85-100
Frequency	2	3	7	6	6	6

(a)Find the mean marks obtained by the students

- (i) 61 (ii) 62 (iii) 63 (iv) 64

(b)Find the cumulative frequency value for class 40-55

- (i) 5 (ii) 12 (iii) 2 (iv) 18

(c)Find the lower limit of median class

- (i) 55 (ii) 40 (iii) 70 (iv) 25

(d) Find lower limit of modal class

- (i) 40 (ii) 55 (iii) 70 (iv) 25

(e)What is the class size

- (i) 10 (ii) 5 (iii) 15 (iv) 20

PART – B

Q 21) Solve $\frac{x+3}{x-2} - \frac{1-x}{x} = \frac{17}{4}$

Q22) Determine the ratio in which the line $2x+y-4=0$ divides the line segment joining the points A(2,-2) and B(3,7).

Q 23) If (1,2), (4,y),(x,6) and (3,5) are the vertices of a parallelogram taken in order find x and y .

Q 24) Explain why $7 \times 11 \times 13 + 13$ is a composite number.

OR

Check whether 6^n can end with the digit 0 for any natural number,give reason.

Q 25) If one root of Quadratic Equation $3x^2+px+4=0$ is $\frac{2}{3}$, .Find the value of p and other root of the equation.

Q 26) Which term of the AP: 3,15,27,39,... will be 132 more than its 54th term.

OR

If five times the fifth term of an AP is equal to 8 times its eighth term. Show that its 13th term is zero.

Q 27) Prove that $5 - 2\sqrt{3}$ is an irrational number. It is given that $\sqrt{3}$ is irrational.

OR

Prove that $3 + 2\sqrt{5}$ is an irrational number. It is given that $\sqrt{5}$ is irrational.

Q 28) Solve equations $2x + 3y = 11$ and $2x - 4y = -24$.

Hence find the value of m for which $y = mx + 3$

Q 29) BL and CM are medians of a triangle ABC right angled at A.

Prove that $4(BL^2 + CM^2) = 5 BC^2$

Q 30) Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60° .

Q 31) If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289. Find the sum first n terms.

Q 32) The angle of elevation of the top of a building from the foot of a tower is 30° and angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 50 m high, find the height of the building.

Q 33) Prove that $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{Cosec} A + \cot A$

OR

Prove that $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \sec A \operatorname{cosec} A$

Q34) Sum of the areas of two squares is 468 m^2 . If the difference of their perimeter is 24 m, find the sides of the squares.

Q 35) Water in a canal 6 m wide and 1.5 m deep is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes if 8 cm of standing water is needed

OR

From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of same height and same diameter is hollowed. Find the total surface area of remaining solid.

Q 36) State and Prove Basic Proportionality Theorem.