

TERM - I EXAMINATION-(2026-27)
CLASS X – MATHEMATICS(BASIC)

Time Allowed: 3 Hours
General Instructions:

Max Marks :80
Printed Pages: 06

- The question paper has 5 sections A,B,C,D and E.
- Section A has 20 MCQs carrying 1 mark each.
- Section B has 5 questions carrying 2 marks each.
- Section C has 6 questions carrying 3 marks each.
- Section D has 4 questions carrying 5 marks each.
- Section E has 3 case based questions (4 marks each) with sub parts of the values 1, 1 and 2 marks each respectively.

SECTION-A

(1x20 =20)

Q.1) Cards numbered 7 to 40 were put in a box. A card is selected at random from the box. The probability that the selected card has a number which is a multiple of 7 is:-

- (a) $\frac{7}{34}$ ~~(b) $\frac{7}{35}$~~ (c) $\frac{6}{35}$ (d) $\frac{5}{34}$

Q.2) If one root of the quadratic equation $x^2 - 4x + 3 = 0$ is 1, then the other root is:-

- (a) 4 ~~(b) -4~~ (c) 3 (d) -3

Q.3) The coordinates of a point on the x -axis, which is equidistant from $(-2, 5)$ and $(2, -3)$ are:-

- (a) $(-5, 0)$ ~~(b) $(-3, 0)$~~ (c) $(-4, 0)$ (d) $(-2, 0)$

Q.4) If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$; x and y are prime numbers, then $HCF(a, b)$ is

- (a) xy ~~(b) xy^2~~ (c) x^3y^3 (d) x^2y^2

Q.5) Value of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is

- (a) 0 only (b) 4 ~~(c) 8 only~~ (d) 0, 8

Q.6) If $\tan A = \frac{3}{4}$, then $\frac{\sin^2 A + \cos^2 A}{\sec A}$ is equal to

- ~~(a) $\frac{4}{3}$~~ (b) $\frac{4}{5}$ (c) $\frac{3}{5}$ (d) $\frac{5}{4}$

Q.7) If in triangles ABC and DEF , $\frac{AB}{DE} = \frac{BC}{FD}$, then they will be similar, when:-

- (a) $\angle B = \angle E$ (b) $\angle A = \angle D$ (c) $\angle B = \angle D$ ~~(d) $\angle A = \angle F$~~

Q.8) The points $(-4, 0)$, $(4, 0)$ and $(0, -3)$ are the vertices of a/an:-

- (a) right-angled triangle (b) isosceles triangle (c) equilateral triangle ~~(d) scalene triangle~~

Q.9) If the mean and the median of a data are 12 and 15 respectively, then its mode is:-

- (a) 13.5 (b) 21 (c) 6 (d) 14

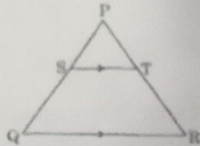
Q.10) The probability that a non leap year selected at random will contain 53 Sundays is

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

Q.11) If $\sin \theta = \cos \theta$, then the value of $2\tan\theta + \cos^2\theta$

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

Q.12) In the given figure, in ΔPQR , $ST \parallel QR$. If $PS = 16 \text{ mm}$ and $PQ = 40 \text{ mm}$, then $PT : TR$ is:-



- (a) 2 : 3 (b) 3 : 2 (c) 2 : 5 (d) 5 : 2

Q.13) $\frac{\sin^4\theta - \cos^4\theta}{\sin^2\theta - \cos^2\theta}$ is equal to :-

- (a) -1 (b) 0 (c) 2 (d) 1

Q.14) If $\cot\theta = \frac{1}{\sqrt{3}}$, the value of $\sec^2\theta + \operatorname{cosec}^2\theta$ is :-

- (a) $\frac{16}{3}$ (b) $\frac{38}{9}$ (c) $5\frac{3}{4}$ (d) 1

Q.15) In ΔPQR and ΔMNS , $\frac{PQ}{NS} = \frac{QR}{MS} = \frac{PR}{MN}$, then symbolically we write it as :-

- (a) $\Delta PQR \sim \Delta MNS$ (b) $\Delta PQR \sim \Delta SMP$ (c) $\Delta QRP \sim \Delta NSM$ (d) $\Delta QRP \sim \Delta SMN$

Q.16) The mid-point of the line segment joining points (1, 3) and (1, -3) lies:-

- (a) at the origin (b) in the second quadrant (c) on x-axis (d) on y-axis

Q.17) For a distribution, if mean = median = a , then its mode is :-

- (a) $3a$ (b) a (c) $2a$ (d) 0

Q.18) The value of m for which lines $14x + my = 20$ and $-3x + 2y = 16$ are parallel is :-

- (a) $\frac{-3}{14}$ (b) $\frac{-7}{3}$ (c) $\frac{-28}{3}$ (d) $\frac{-3}{28}$

Q.19 and Q.20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled as Assertion(A) and the other is labelled as Reason(R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true, but R is not the correct explanation of A.
 (c) A is true, but R is false.
 (d) R is true, but A is false.

Q.19) **Assertion (A):** The system of equations $x - 2y - 5 = 0$ and $2x - 6y + 9 = 0$ has a unique solution

Reason (R): The system of equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has a unique solution when $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Q.20) **Assertion (A):** Seven face cards are removed from a deck of cards and the cards are well shuffled. The probability of drawing a face card is $\frac{5}{52}$

Reason (R): King, Queen and Jack are known as face cards.

SECTION-B

(2x5=10)

Q.21) If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \frac{1}{\sqrt{3}}$, $0^\circ < A+B \leq 90^\circ$. Find A and B

Q.22) For what value of k , does the given system of equations have an infinite number of solutions?

$$2x + 3y = 7$$

$$(k-1)x + (k+2)y = 3k$$

Q.23) Find the nature of the roots of the following quadratic equation. If the real roots exist, find them. $3x^2 - 4\sqrt{3}x + 4 = 0$

Q.24) If $(1, 2)$, $(4, y)$, $(x, 6)$ and $(3, 5)$ are vertices of a parallelogram taken in order. Find x and y .

OR

If a point $P(2,3)$ divides the line segment joining the points $A(1, 2)$ and $B(4, k)$ in the ratio $1 : 2$, find the value of k .

Q.25) To enhance the reading skills of grade X students, the school decides to set up a class library. There are two sections, Section-A and Section-B of grade X. There are 32 students in Section A and 36 students in Section B. What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B?

SECTION-C

(3X6=18)

Q.26) Prove that $\sqrt{5}$ is irrational.

Q.27) Three consecutive positive integers are such that the sum of the square of the first and the product of other two is 46, find the numbers.

Q.28) Prove that $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

OR

Prove that: $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$

Q.29) In a single throw of two dice, find the probability of:-

(i) getting a total of 10

(ii) getting a doublet of even numbers

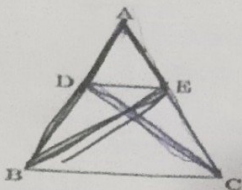
(iii) getting a sum greater than 9

Q.30) The sum of the present ages of father and his son is 60 years. 6 years ago, father's age was five times the age of his son. Find the present age of father and son.

OR

If two is subtracted from numerator and 1 is added to the denominator, a fraction becomes $\frac{1}{2}$, but when 4 is added to numerator and 3 is subtracted from the denominator, it becomes $\frac{3}{2}$. Find the fraction.

Q.31) It is given that $\triangle ACD \cong \triangle ABE$. Prove that $\triangle ADE \sim \triangle ABC$.



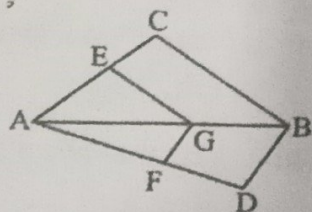
SECTION-D

(5x4=20)

Q.32) (i) If a line is drawn parallel to one side of a triangle intersecting the other sides in distinct points, prove that it divides the other sides in the same ratio.

(ii) Use the above result to prove the following:

In the given figure, if $EG \parallel CB$ and $FG \parallel DB$, then prove that $\frac{AE}{EC} = \frac{AF}{FD}$



Q.33) Draw the graph of the equations $2x - y - 4 = 0$ and $x + y + 1 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the x -axis.

Q.34) The following table gives the distribution of total household expenditure (in rupees) of manual workers in a city. Calculate mean expenditure (in Rs) per household.

Expenditure (in Rs)	100-150	150-200	200-250	250-300	300-350	350-400	400-450	450-500
Frequency	24	40	33	28	30	22	16	7

OR

If the median of following frequency distribution is 46, find the missing frequencies.

Class Intervals	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Total
Frequency	12	30	f_1	65	f_2	25	18	230

Q.35) Prove that $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$

CASE STUDY .

SECTION-E

(4x3=12)

Q.36) Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x kilometer per hour while Ajay's car travels 5 kilometer per hour faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 kilometer.



Based on the given sources answer the following questions :

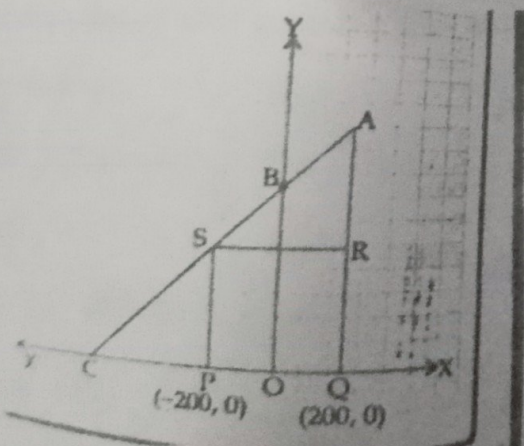
- i) Write the time taken by both cars. 1m
- ii) Write a quadratic equation for the above situation. 1m
- iii) What is the speed of Raj's car? 2m

OR

Solve $\frac{1}{x} - \frac{1}{x+5} = \frac{1}{100}$ 2m

Q37. Jagdish has a field which is in the shape of a right angled triangle AQC. He wants to leave a space in the form of a square PQRS inside the field for growing wheat, and the remaining for growing vegetables as shown in the figure. In the field there is a pool marked as O.

Now answer the following questions based on above



- i) Taking O as origin, coordinates of P are $(-200, 0)$ and Q are $(200, 0)$. PQRS being square, what are the coordinates of R and S? 1mk

ii) What are the coordinates of O.

1mk

iii) What is the length of diagonal PR in square PQRS.

2mk

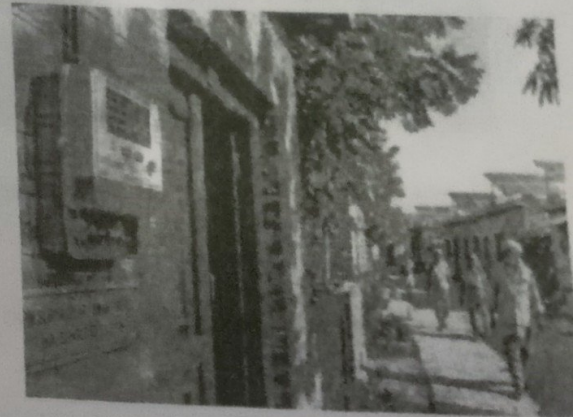
OR

What is the length of the side of this square.

2mk

Q.38) **CASE BASED-III** Under the 'PM Surya Ghar': Muft Bijli Yojana, a smart village cooperative installed rooftop solar power meters in 50 households to record daily solar electricity generation. The energy monitoring portal recorded the average daily electricity generation (in kWh) for 50 homes during peak summer days. The recorded data is organized into the following frequency distribution table:-

Daily Electricity Generation (in kWh)	Number of Households
5 – 15	6
15 – 25	11
25 – 35	21
35 – 45	23
45 – 55	14
55 – 65	5



Answer the following questions:-

(i) What is the class mark of modal class?

1mk

(ii) Find the median class of given data.

1mk

(iii) Find the mode of the given data.

2mk

OR

Find the median of the given data.

2mk

END OF QUESTION PAPER