PRACTICE TEST (2019-20)
SUBJECT: MATHEMATICS (BASIC) (241)
CLASS: X

MAX. MARKS: 80 **DURATION: 3:00 HRS**

General Instructions –

a) All questions are compulsory.
b) The question paper consists of 40 questions divided into 4 sections A, B, C & D.
c) Section A comprises 20 questions of 1 mark each.
Section B comprises 6 questions of 2 marks each.
Section C comprises 8 questions of 3 marks each.
Section D comprises 6 questions of 4 marks each.
d) There is no overall choice. However internal choices have been provided in 2 questions of 1 mark each, 2 questions of 2 marks each, 3 questions of 3 marks each, 3 questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
e) Use of calculators is not permitted.

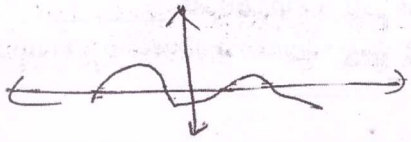
Section – A

Q1 – 10 are multiple choice questions. Select most appropriate answer from the given options.

Q1. The L.C.M. of 72 and 120 is
a) 300
b) 350
c) 360
d) 120

Q2. The number $\frac{287}{625}$ will terminate after how many places of decimal.
a) 2
b) 3
c) 4
d) 5

Q3. How many zeroes the polynomial has? See following graph
a) 3
b) 4
c) 5
d) 2



Q5. The number 1000 can be expressed product of its primes as
a) $2^4 \times 5^2$
b) $2^3 \times 5^3$
c) $10^2 \times 5^2$
d) 2×3^5

Q6. The product of zeroes of the polynomial $2x^2 - 7x + 6$ is
a) 3
b) 4
c) 7
d) 6

Q4 If α, β are zeroes of polynomial ax^2+bx+c then $\alpha+\beta =$

(a) $\frac{b}{a}$ (b) $-\frac{b}{a}$ (c) $\frac{1}{a}$ (d) $-\frac{1}{a}$

Q7. Which of following is an irrational number?

a) 3.123

b) $0.\overline{13}$

c) 2.010010001....

d) $7.\overline{7}$

Q8. The distance of the point P (6, 8) from the origin is

a) 10 units

b) 14 units

c) 12 units

d) 2 units

Q9. Roots of a quadratic equation $ax^2+bx+c=0$ are real then.

a) $D=0$

b) $D>0$

c) $D\geq 0$

d) $D<0$

Q10. A pair of linear equations in two variables has infinite many solutions if

a) $\frac{a_1}{a_2}\neq\frac{b_1}{b_2}$

b) $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$

c) $\frac{a_1}{a_2}=\frac{b_1}{b_2}\neq\frac{c_1}{c_2}$

d) None of these

(Q11 – 15) Fill in the blanks.

Q11. Point on x – axis which is equidistant from A (2, -5) and B (-2, 9) is _____

Q12. If quadratic equation $x^2-8x+k=0$ has equal roots then k = _____

OR

Discriminant of quadratic equation $2x^2-4x+3=0$ is _____

Q13. The value of $2\tan^2 45^\circ+\cos^2 30^\circ-\sin^2 60^\circ$ is _____

Q14. If $\tan A=\cot B$ then $A+B=$ _____

Q15. The sides of two similar triangles are in the ratio 2:3 then the areas of these triangles are in the ratio _____

(Q16 – 20) Answer the following –

Q16. Find value of $\frac{\tan 65^\circ}{\cot 25^\circ}$

Q17. Find area of an equilateral triangle whose side is 10 cm.

Q18. Find area swept by a minute hand in 15 minutes. r = length of minute hand = 7 cm

Q19. If $\sec\theta = \frac{13}{12}$ find cosec θ

OR

Find value – $\frac{2\tan^2 30^\circ}{1-\tan^2 30^\circ}$

Q20. Find 30th term of AP: 10, 7, 4, _ _ _ _

OR

Find next term of A.P

$\sqrt{2}$, $\sqrt{8}$, $\sqrt{18}$, $\sqrt{32}$

Section – B

Q21. Find L.C.M. & H.C.F. of 12, 15 and 21.

Q22. Prove that the tangent drawn at the ends of a diameter of a circle are parallel.

Q23. Find sum of first 1000 positive integers.

OR

Find sum of the odd numbers between 0 & 50.

Q24. ΔABC is an equilateral triangle of side 2a. Find each of its altitudes.

Q25. If $\sec\theta = \frac{13}{12}$ calculate tan θ & sin θ

OR

Evaluate – $\frac{\sin^2 63^\circ + \sin^2 27^\circ}{\cos^2 17^\circ + \cos^2 73^\circ}$

Q26. In a circle of radius 21cm, an arc subtends an angle of 60° at the centre. Find length of arc.

Section – C

Q27. Using Euclid's Lemma Find H.C.F of 135 and 225

OR

Show that any positive odd integer is of the form 6q+1, 6q+3 or 6q+5 where q is some integer.

Q28. Prove that $\sqrt{2}$ is an irrational number.

Q29. Solve by cross multiplication method

$8x + 5y = 9$

$3x + 2y = 4$

OR

Solve $6x + 3y = 6xy$

$2x + 4y = 5xy$

Q30. Find roots of following quadratic equation by method of completing square of $2x^2 - 7x + 3 = 0$

OR

Solve $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$

Q31. Obtain all zeroes of polynomial $2x^4 - 3x^3 - 3x^2 + 6x - 2$ if two zeroes are $\sqrt{2}$ *and* $-\sqrt{2}$

Q32. Find sum of first 15 multiples of 8.

OR

How many terms of AP: 9, 17, 25, _ _ _ _ must be taken to give a sum 636?

Q33. Prove that –

$$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$$

OR

If $\sec 4A = \operatorname{cosec}(A - 20^\circ)$ Find value of A.

Q34. Prove that lengths of tangents drawn to a circle from an external point are equal.

Q35. In a circle of radius 21 cm an arc subtends an angle 60° at centre. Find

(i) Length of arc

(ii) Area of sector formed by arc.

Section – D

Q36. Construct a Δ of sides 4cm 5cm and 6cm then a triangle similar to whose sides are $\frac{2}{3}$ of corresponding sides of first triangle.

OR

Draw a circle of radius 6cm. from a point 10cm away from its centre construct the pair of tangents to the circle and measure their lengths.

Q37. State & prove Pythagoras theorem.

OR

State & prove Basic proportional theorem.

Q38. A motor boat whose speed is 18 km/hr in still water takes 1 hr more to go 24 km upstream than to return downstream to the same point. Find speed of stream.

Q39. The angle of elevation of top of a building from the foot of the tower is 30° and angle of elevation of top of tower from foot of building is 60°. If tower is 50 m high, find height of building.

Q40. For which values of a & b following pair of linear equations have an infinite number of solutions.

$$2x+3y=7$$
$$(a-b)x+(a+b)y=3a+b-2$$

OR

Find value of k for which points (8, 1), (k, -4), (2, -5) are collinear.

Mathematics Basic (241)
Practice Paper

Marking Scheme

Four MCQ Q1 – 20 1 Mark each

Q 1 (C) 360

Q 2 (C) 4 Places of decimal

Q 3 (B) 4

Q 4 (b) $-\frac{b}{a}$

Q 5 (A) $2^3 \times 5^3$

Q 6 (A) 3

Q 7 (C) 2.01001---

Q 8 (A) 10 units

Q 9 (C) $D \geq 0$

Q 10 (C) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Q 11 $(-7, 0)$

Q 12 $k = 16$

Q 13 2

Q 14 $A + B = 90^\circ$

Q 15 4 : 9

Q 16 1

Q 17 $25\sqrt{3}$ cm^2

Q 18 38.5 cm^2

Q 19

$\cot\theta = \frac{13}{5}$

or

~~0~~ 1

Q 20 $a_{30} = -77$

or

$\sqrt{50}$

Q(21 — 26) 6 Q Carry 2 Marks each

Q21 Finding L.C.M. = 840 1 Mark

Finding H.C.F = 3 1 Mark

Q22 Correct figure ½ Mark

Correct Proof 1½ Mark

~~integers~~

Q23 ~~1, 2, 3~~

$a = 1$, $d = 1$

$S_n = \frac{n}{2}[a + l]$ 1 Mark

or $S_n = \frac{n}{2}[2a + (n-1)d]$

$S_{1000} = 500500$ 1 Mark

~~Q24~~

OR

AP: 1, 3, 5, ... 49

$a = 1$, $d = 2$ 1 Mark

$n = 25$

$S_n = 625$ 1 Mark

Q24 Applying Pythagoras Theorem 1 Mark

Finding $AD = \sqrt{3}a$ 1 Mark

Q25 Finding $\tan\theta = \frac{5}{12}$ 1 Mark

$\sin\theta = \frac{5}{13}$ 1 Mark

OR $\sin^2 63° + \cos^2 63° = 1$ 1 Mark

$\cos^2 17° + \sin^2 17° = 1$ 1 Mark

Q26 $l(\overset{\frown}{AB}) = \frac{\pi r \theta}{180^\circ}$ and Substituting Values — 1 Mark

$l(\overset{\frown}{AB}) = 22\,cm$ — 1 Mark

Section C 27–34 Carry 3 Marks each.

Q27 Applying Euclid's Lemma — 1 Mark

Finding HCF = 45 — 1 Mark

~~Q28~~ OR

For $a = bq + r$, $0 \le r < b$

$a = 6q + r$, $0 \le r < 6$ — 1 Mark

$r = 0, 1, 2, 3, 4, 5$

$a = 6q,\ 6q+1,\ 6q+2,\ 6q+3,\ 6q+4,\ 6q+5$. — 1 Mark

Chosing odd Integers $a = 6q+1,\ 6q+3,\ 6q+5$ — 1 Mark

Q28 Correct proof by Contradiction — 3 Marks

Q29. For by Cross Multiplication method — 1 Mark

$x = -2$ — 1 Mark

$y = 5$ — 1 Mark

OR

$6x + 8y = 6xy \Rightarrow \frac{6}{y} + \frac{8}{x} = 6$ — 1 Mark

$2x + 4y = 5xy \quad \frac{2}{y} + \frac{4}{x} = 5$

$x = \frac{4}{9}$ — 1 Mark

$y = -\frac{1}{2}$ — 1 Mark

Q30 $\left(x - \frac{7}{4}\right)^2 = \frac{25}{16}$ (1½) Mark

$x - \frac{7}{4} = \pm \frac{5}{4}$ (½) Mark

$x = 3, \frac{1}{2}$ 1 Mark

OR

$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$

$\frac{x - 7 - x - 4}{(x+4)(x-7)} = \frac{11}{30}$ 1 Mark

$\frac{-11}{x^2 - 7x + 4x - 28} = \frac{11}{30}$

$-30 = x^2 - 3x - 28$

$x^2 - 3x + 2 = 0$ 1 Mark

$(x-1)(x-2) = 0$

$x = 1, 2$ 1 Mark

Q31

For obtaining Quotient $= 2x^2 - 3x + 1$

1 Mark

For obtaining 2 Zeroes

$x = 1, \frac{1}{2}$ 2 Marks

Q32 $n = 15$ or $d = 120$ (1 Mark)

$S_n = \frac{n}{2}[a+d]$ 1 Mark

$S_n = 960$ 1 Mark

Or

For equation $4n^2 + 5n - 636 = 0$ 1½ Marks

$D = b^2 - 4ac$

$= (101)^2$ ½ Mark

$n = 12$ 1 Mark

Q33 $\text{Cosec}(90° - 4A) = \text{Cosec}(A - 20°)$ 2 Marks

$A = 22°$ 1 Mark

Q34 Given to prove 1½ Mark

Figure

Correct Proof 2½ Marks

Figure

Q35 (i) $d(AB) = 22$ cm 2 Marks

Formula 1 Mark

(ii) Area of Sector $= 231\ cm^2$ 2 Marks

Formula and Values 1 Mark

Q36 Const $\triangle$ 1 Mark

Const Similar Figure 3 Marks

or Draw Circle 1 Mark

For Each tangent 1½ Marks

Q37 Statement & figure & To prove — 1½ Mark
Proof — 2½ Marks

Q38 For equation

$$\frac{24}{18-x} - \frac{24}{18+x} = 1$$ — 1½ Marks

$$x^2 + 48x - 324 = 0$$ — 1½ Mark

By Factors

Speed of Stream $x = 6$ km/hr — 1½ Mark

Q39

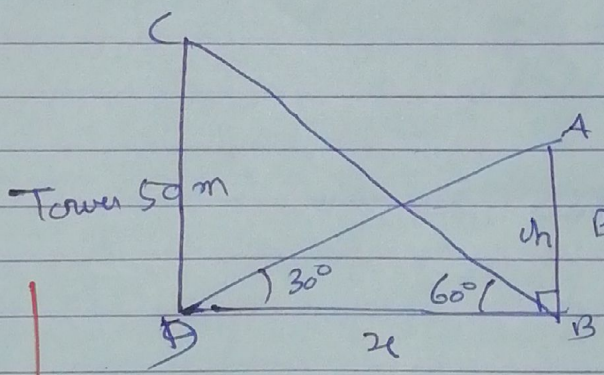


Figure — 1½ Mark

$$\frac{50}{x} = \tan 60°$$

$$x = \frac{50}{\sqrt{3}}$$

$$h = x \times \frac{1}{\sqrt{3}}$$ — 1½ Mark

$$h = \frac{50}{3} \text{ m}$$ — 1 Mark

$$= 16.66 \text{ m.}$$

Q40 For collinear or $\Delta = 0$ — 1 Mark

$K = 3$ — Value. 1 Mark, 2 Mark

Q40

For $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ — 1 Mark

$$\frac{2}{a-b} = \frac{3}{a+b} = \frac{7}{3a+b-2}$$

$a = 5$, $b = 1$ — 2 Marks

$$a - 9b + 4 = 0 \quad \text{(1)}$$

$$a - 2b - 3 = 0 \quad \text{(2)}$$ — 1 Mark