



DELHI PUBLIC SCHOOL NEWTOWN
SESSION 2021-22
FINAL EXAMINATION

CLASS: IX

FULL MARKS: 80

SUBJECT: MATHEMATICS

TIME: 2HOURS 30 MINS

- Candidates are allowed additional 10 minutes for only reading the paper . They must not start writing during this time
- The question paper comprises two parts. Part I is based on Multiple Choice Questions. Part II is based on Subjective/Long Question
- The intended marks for questions are given in brackets. []
- The Paper consists of 6 printed pages.

PART I [Attempt all questions]

[1x10]

1. If $a = 2 + \sqrt{3}$, then the value of $a - \frac{1}{a}$ is:
a) $\sqrt{3}$
b) $2\sqrt{3}$
c) 0
d) $-\sqrt{3}$
2. The C.I for the second year on ₹ 25000 at 12% p.a, compounded annually is:
a) ₹ 3000
b) ₹ 3360
c) ₹ 6360
d) ₹ 31360
3. The value of y for the following system of simultaneous linear equations $x + y = 5$ and $2x - 3y = 4$ is:
a) $5/6$
b) 3
c) 2
d) $6/5$

4. Solve for x: $\log(3x - 2) = 2$

a) $4/3$

b) 98

c) 34

d) 43

5. A rectangular field is 40m long and 30m breadth. The length of its diagonal is:

a) 10m

b) $\sqrt{700}$ m

c) 100m

d) 50m

6. If $x^2 + (\frac{1}{x})^2 = 7$, then the value of $x + \frac{1}{x}$ is:

a) 3

b) -3

c) ± 3

d) 0

7. If $p = 3$, $q = 1$ and $r = 2$ then the value of $2^p \cdot 3^q \cdot 7^{-r}$ is:

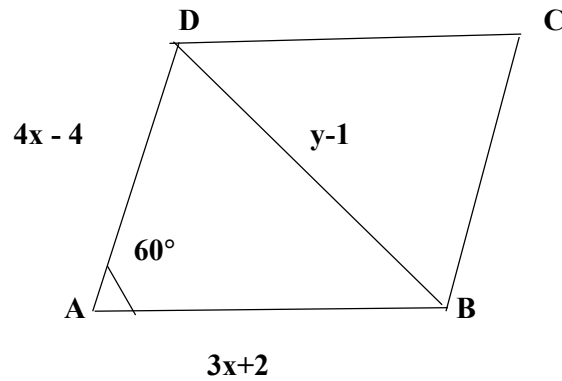
a) $24/49$

b) $49/24$

c) 24

d) 49

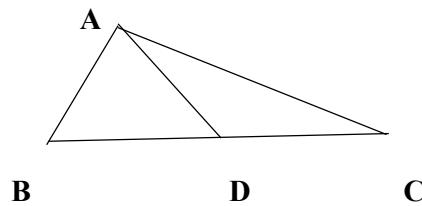
8. The value of “y” in the rhombus ABCD is :



- a) 20
- b) 21
- c) 19
- d) 22

9. In triangle ABC, AD divides BC in the ratio m: n, then the ratio of area of ABD : area of ADC is:

- a) m:1
- b) n:1
- c) m:n
- d) n:m



10. The radius of the wheel of a car is 28cm. Find the number of rotation made by the wheel order to cover a distance of 4.4km ?

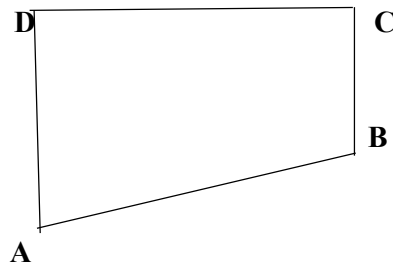
- a) 2500
- b) 250
- c) 25
- d) 25000

11. Find the mean of first 5 prime numbers.

- a) 5.6
- b) 3.6
- c) 3
- d) 3.5

12. The given figure shows a trapezium ABCD in which AD is parallel to BC, angle ADC = angle BCD = 90° , AB = 17cm, BC = 8cm and CD = 15cm. Find the area of the trapezium.

- a) 152.5 cm^2
- b) 120 cm^2
- c) 180 cm^2
- d) 172.5 cm^2



13. Three cubes each of edge 8cm, are joined end to end. Find the total surface area of the resulting cuboid.

- a) 1164 square cm
- b) 216 square cm
- c) 384 square cm
- d) 896 square cm

14. In a right angle triangle. If angle A is acute and $\cot A = 4/3$, find the value of $\sec A$.

- a) $3/4$
- b) $4/5$
- c) $3/5$
- d) $5/4$

15. The area of a circle, whose centre is (5, -3) and which passes through the point (-7, 2) is:

- a) 13π square units
- b) 169π square units
- c) 11π square units
- d) 10π square units

PART II

SECTION A (COMPULSORY)

Question 1

i) Simplify:

$$(\sqrt{5} + \sqrt{3}) \div (\sqrt{5} - \sqrt{3}) + (\sqrt{5} - \sqrt{3}) \div (\sqrt{5} + \sqrt{3}) \quad [3]$$

ii) A man invest ₹ 46875 at 4% p.a compound interest for 3 years, calculate

a) The interest for the first year

b) The amount at the end of second year

c) The interest for the third year. [3]

iii) Draw a frequency polygon for the following data:

CI	30-40	40-50	50-60	60-70	70-80
f	40	60	50	35	20

[4]

SECTION B (ATTEMPT ANY FOUR)

Question 2

i) If $\log\left(\frac{a-b}{2}\right) = \frac{1}{2}(\log a + \log b)$, show that $a^2 + b^2 = 6ab$ [3]

ii) In a right-angled triangle ABC, $\angle ABC = 90^\circ$ and D is the midpoint of AC.

Prove that: $BD = \frac{1}{2} AC$ [3]

iii) A number consists two digits, the difference of whose digit is 5. If 8 times the number is equal to 3 times the number obtained by reversing the digit find the number. [4]

Question 3

i) If $2^{5x-1} = 4 \cdot 2^{3x+1}$. Find the value of x. [3]

ii) In triangle ABC, D is any point on BC. Prove that $AB + BC + AC > 2AD$ [3]

iii) A classroom is 12.5 m long, 6.4 m broad and 5m high. How many students can accommodate if each student needs 1.6 square metre of floor area? How many cubic metres of air would each student get? [4]

Question 4

i) Factorise:

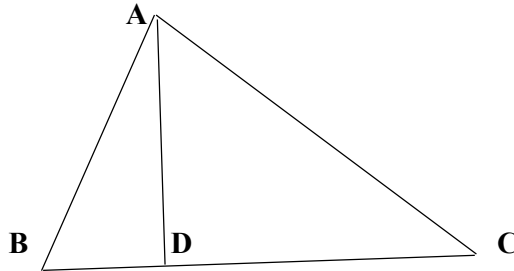
$$a^4 - 11a^2 + 10 \quad [3]$$

ii) In a rectangle ABCD, AB= 12cm and angle BAC= 30° . Calculate the length of the side BC and diagonal AC. [3]

iii) If P and Q are points of trisection of the diagonal BD of a parallelogram ABCD, prove that $CQ \parallel AP$ [4]

Question 5

- i) In the adjoining figure, AD is perpendicular to BC. If D divides BC in the ratio 1: 3, prove that $2AC^2 = 2AB^2 + BC^2$. [3]



- ii) Show that the line segments joining the mid points of the opposite sides of a quadrilateral bisect each other. [3]

- iii) The base of an isosceles triangle is 24cm and its area is 192 cm^2 . Find its perimeter. [4]

Question 6

- i) Calculate the length of the chord which is at a distance of 6cm from the centre of the circle of diameter 20cm. [3]

- ii) Find the points on the y axis which are at a distance of 10 units from the point (8 , 8). [3]

- iii) Using ruler and compasses only, construct a parallelogram ABCD with $AB=5.1\text{cm}$, $BC=7\text{cm}$ and $\angle ABC = 75^\circ$. [4]