

# INSTITUTE OF MATHEMATICS EDUCATION

## MATHS APTITUDE MOCK TEST – 2020 (Higher Primary Level)

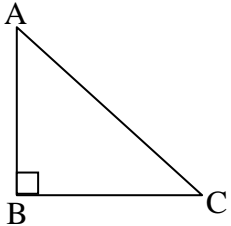
Std. : VII and VIII

Question Paper

Date : 12.09.2019

Time : 2 Hours

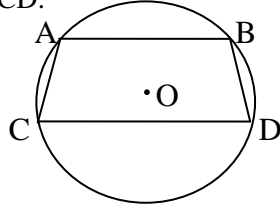
Total Marks : 100

- Q.1 :** Find GCD of  $13x^3y$ ,  $104x^2y^2$ ,  $78xy^3$   
(A)  $13x^2y^2$  (B)  $104x^3y^3$   
(C)  $13xy$  (D)  $104x^2y^2$
- Q.2 :** Find x if 0.7, 1.4, x, 2.2 are in proportion.  
(A) 11 (B) 1.1  
(C) 1.21 (D) 7.7
- Q.3 :** x % of 75 = 10% of 90, find x.  
(A) 12 (B) 9  
(C) 15 (D) Any other
- Q.4 :** If by selling an article for ₹ 100, a man gains ₹ 15, then profit % is  
(A) 15% (B) 35%  
(C)  $17\frac{11}{17}\%$  (D)  $17\frac{1}{4}\%$
- Q.5 :** In how many years principal becomes 3 times of itself at 20 p.c.p.a.?  
(A) 15 years (B) 20 years  
(C) 10 years (D) Any other
- Q.6 :** Find the average of first 10 multiples of 4.  
(A) 20 (B) 22  
(C) 24 (D) 21
- Q.7 :** A car travels 500 m in 20 sec. Find its speed in km/hr.  
(A) 72 km/hr (B) 80 km/hr  
(C) 90 km/hr (D) Any other
- Q.8 :** If  $a = -2$ ,  $b = -1$  and  $c = -3$ , then find  $\sqrt{b^2 + 4ac}$ .  
(A) 25 (B) -23 (C)  $\sqrt{23}$  (D) 5
- Q.9 :** If  $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{a}{b}\right)^{2x-3}$  then find x.  
[  $\frac{a}{b} \neq 1, 0, -1$  ]  
(A)  $\frac{1}{2}$  (B) 2  
(C) 1 (D) Any other
- Q.10 :** If two angles are supplementary, then which of the following is true?  
(A) Both can be obtuse  
(B) Both can be acute  
(C) Both can be right  
(D) All the above are true
- Q.11 :** A takes 2 hours more to do certain piece of work than B. Also B does  $\frac{1}{40}$  th work more than A in one hour. How much time A takes to complete the work alone?  
(A) 10 hrs (B) 8 hrs  
(C) 12 hrs (D) 5 hrs
- Q.12 :** Find the ratio of interior angle to exterior angle of a regular octagon.  
(A) 1 : 3 (B) 3 : 1  
(C) 2 : 1 (D) 4 : 1
- Q.13 :** Subtract  $(5m^2 - 2m^2n^2 + 3mn + 11n^2)$  from  $(7m^2 - 2n^2 + 3mn - 4m^2n^2)$   
(A)  $2m^2 + 13n^2 + 4m^2n^2$   
(B)  $2m^2 + 13n^2 - 2m^2n^2$   
(C)  $2m^2 - 13n^2 - 2m^2n^2 + 6mn$   
(D)  $2m^2 - 13n^2 - 2m^2n^2$
- Q.14 :** If in  $\Delta ABC$ ,  $\angle A = 70^\circ$ ,  $\angle B = 50^\circ$ , then which of the following is true?  
(A)  $AB > AC > BC$  (B)  $BC > AB > AC$   
(C)  $BC > AC > AB$  (D) Cannot say
- Q.15 :** In  $\Delta ABC$ ,  $\angle A = 30^\circ$ ,  $\angle ABC = 90^\circ$ . If  $AC = 12.6$  cm, find perimeter of  $\Delta ABC$ .  
(A)  $25 + 2\sqrt{3}$  cm  
(B)  $6.3(3 + \sqrt{3})$  cm  
(C)  $18.9 + \sqrt{3}$  cm  
(D) Any other
- 
- Q.16 :** If length and breadth of a rectangle are  $(3m^2 + 5m + 2)$  cm and  $(2m^2 - 3m + 1)$  cm respectively, then find the perimeter of the rectangle.  
(A)  $(5m^2 + 2m + 3)$  cm  
(B)  $(10m^2 + 4m + 6)$  cm  
(C)  $(10m^2 - 8m + 3)$  cm  
(D)  $(10m^2 + 8m + 6)$  cm
- Q.17 :** Out of three numbers the first number is 3 more than twice the second number and the second number is 5 less than 4 times the third number. If sum of all the three numbers is 183, find the largest number.  
(A) 113 (B) 15  
(C) 55 (D) Any other

- Q.18 :** Area of a square and a rectangle are equal. If length of the rectangle is 2 times that of breadth, then side of the square is  
 (A) 2 times breadth of rectangle  
 (B)  $\frac{1}{2}$  the breadth of rectangle  
 (C)  $\sqrt{2}$  times the breadth of rectangle  
 (D)  $\sqrt{2}$  times the length of rectangle

- Q.19 :** In a circle with centre 'O' and radius 13 cm, chord AB || chord CD. If AB = 10 cm, and CD = 24 cm, find area of  $\square ABCD$ .

- (A) 17 sq cm  
 (B) 289 sq cm  
 (C) 120 sq cm  
 (D) Any other



- Q.20 :** Simplify :  $\frac{1.6}{(0.9)^2 - (0.7)^2}$

- (A) 5 (B) 0.5  
 (C) 0.2 (D) 1

- Q.21 :** If  $p - q = 2020$ , then  $(-1)^p - (-1)^q = ?$

- (A) -2 (B) 2  
 (C) 0 (D) can't determine

- Q.22 :** Total surface area of a closed hemisphere is 105 sq. cm. Find the surface area of a sphere whose radius is same as that of hemisphere.

- (A) 140 sq cm (B) 35 sq cm  
 (C) 210 sq cm (D) Any other

- Q.23 :** If  $\frac{81^2 \times 27^3}{8^3 \times 3^8} = 3^x \times 2^y$ , then find  $x + y$

- (A) 18 (B) 0  
 (C) 10 (D) 9

- Q.24 :** If  $\sqrt{24} = 4.899$ , then find  $\sqrt{\frac{8}{3}}$ .

- (A) 0.544 (B) 1.333  
 (C) 1.633 (D) 2.666

- Q.25 :** If  $a * b = 2a - 3b + ab$ , then find the value of  $3 * 5 + 5 * 3$

- (A) 22 (B) 24  
 (C) 26 (D) 28

- Q.26 :** Find L.C.M. of numbers  $\frac{a}{b}, \frac{b}{c}, \frac{c}{d}, \frac{d}{e}$  where a, b, c, d, e are prime numbers.

- (A)  $\frac{1}{bcde}$  (B) abcd

- (C) 1 (D) Any other

- Q.27 :** If  $x : y = 2 : 1$ , then find  $x^2 + y^2 : x^2 - y^2$

- (A) 3 : 4 (B) 3 : 5  
 (C) 5 : 3 (D) Any other

- Q.28 :** If A is 10% of B, then what % of A is B?

- (A) 1000 (B) 10  
 (C) 90 (D) 100

- Q.29 :** A man sold two similar items for ₹ 100 each. On first he earned x% profit and on the other he incurred x% loss. Find his total loss or gain %

- (A)  $\frac{x^2}{100}$  % loss (B)  $\frac{x^2}{100}$  % profit

- (C)  $\frac{x}{100}$  % loss (D)  $\frac{x}{100}$  % profit

- Q.30 :** If amount of certain principal becomes ₹15,000 after 7 years at rate of  $12\frac{1}{2}$  pcpa, find principal.

- (A) ₹ 10,000 (B) ₹ 12,000  
 (C) ₹ 7,500 (D) ₹ 8000

- Q.31 :** If a, b, c, d, e, f and g are the 7 consecutive integers, then find their average.

- (A)  $a + 2$  (B)  $a + 3$   
 (C)  $a + 1$  (D)  $a + 5$

- Q.32 :** If a bus runs at 40 km/hr, then it reaches the destination late by 20 min. and if it runs at 50 km/hr, then it reaches destination 5 min late. Find the actual duration of the journey when bus reaches on time.

- (A) 45 min (B) 55 min  
 (C) 30 min (D) 50 min

- Q.33 :** If  $441 \times 169 = 74,529$ , then find

$$\sqrt{\frac{0.74529}{0.169}} - \sqrt{\frac{74.529}{44.1}}$$

- (A) 3.4 (B) 2.1  
 (C) 1.3 (D) 0.8

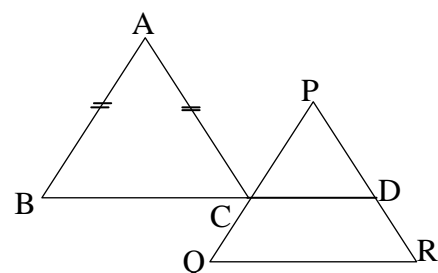
- Q.34 :** Simplify :  $\sqrt[3]{12 \times 24} \times \sqrt[3]{22 \times 33} \times \sqrt[3]{88}$

- (A) 132 (B) 264  
 (C) 88 (D) 96

- Q.35 :** If  $\sqrt{3} = 1.73$ , then find  $\frac{\sqrt{3}}{3 + \sqrt{3}}$ .

- (A) 1.365 (B) 0.366  
 (C) 13.65 (D) Any other

- Q.36 :** In  $\triangle ABC$ ,  $AB = AC$ ,  $AB \parallel PQ$ ,  $BD \parallel QR$  if  $\angle A = 40^\circ$ ,  $\angle P = 60^\circ$ . Find  $\angle PRQ$ .



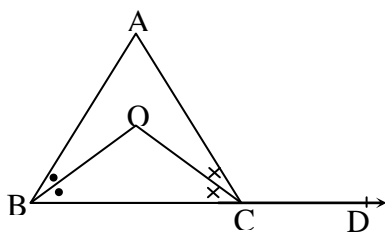
- (A)  $70^\circ$  (B)  $40^\circ$   
 (C)  $100^\circ$  (D)  $50^\circ$

**Q.37 :** 6 men working 8 hrs per day complete the work in 15 days. Find in how many days 4 men can complete the same work if they work 10 hours per day.  
 (A) 14 days (B) 10 days  
 (C) 16 days (D) 18 days

**Q.38 :** A regular polygon of wire having each interior angle equal to  $144^\circ$  and side 0.2 m is rebent to form a regular polygon whose each exterior angle is  $72^\circ$ . Find the length of each side of new polygon.  
 (A) 0.1 m (B) 0.2 m  
 (C) 0.4 m (D) 0.8 m

**Q.39 :** Simplify :  $(2a^2 - 3b^2)(4a^4 + 6a^2b^2 + 9b^4)$   
 (A)  $(8a^6 - 27b^6)$   
 (B)  $(8a^6 + 27b^6)$   
 (C)  $(8a^6 - 36a^4b^2 + 54a^2b^4 - 27b^6)$   
 (D) Any other

**Q.40 :** In  $\triangle ABC$ , BO and CO are bisectors of  $\angle B$  and  $\angle C$ . If  $\angle BOC = 125^\circ$  and  $\angle ACD = 120^\circ$  find  $\angle OBC$ .



- (A)  $70^\circ$  (B)  $50^\circ$   
 (C)  $25^\circ$  (D)  $60^\circ$

**Q.41 :** Find the length of longest stick that can be kept in cuboid having dimensions 24 cm  $\times$  18 cm  $\times$  16 cm  
 (A) 17 cm (B) 20 cm  
 (C) 15 cm (D) 34 cm

**Q.42 :**  $\left[ (\sqrt{5})^2 + \left(\frac{1}{\sqrt{5}}\right)^2 \right] - \left[ (\sqrt{5})^2 - \left(\frac{1}{\sqrt{5}}\right)^2 \right]$   
 (A) 10 (B)  $\frac{1}{10}$   
 (C)  $-\frac{2}{5}$  (D)  $\frac{2}{5}$

**Q.43 :** Lengths of diameters AB, BC and CD are 8 cm, 4 cm and 2 cm respectively. Find the area of shaded figure ( $\pi = 22/7$ )



- (A) 66 sq.cm (B) 33 sq. cm  
 (C) 16.5 sq. cm (D) Any other

**Q.44 :** If  $a + b = 18$  and  $ab = 80$ , then find  $a^2 - b^2$ , if  $a > b$   
 (A) 36 (B) 32  
 (C) 20 (D) 2

**Q.45 :** Find volume of a triangular prism whose height is  $(\sqrt{3}x)$  cm and each side of the base is  $y$  cm  
 (A)  $\frac{\sqrt{3}}{4}y^2$  cu. cm (B)  $\frac{3}{4}xy^2$  cu. cm  
 (C)  $\frac{\sqrt{3}}{4}xy^2$  cu. cm (D)  $\frac{3}{4}x^2y$  cu. cm

**Q.46 :** Find number of digits in the sum  $100 + 100^2 + 100^3 + 100^4 + \dots + 100^{100}$   
 (A) 200 (B) 202  
 (C) 201 (D) Cannot say

**Q.47 :** If the perimeter of right angled triangle is 84 cm and length of hypotenuse is 37 cm, then find its area.  
 (A) 420 sq cm (B) 840 sq cm  
 (C) 210 sq cm (D) Any other

**Q.48 :** Find square root of  $12 + \sqrt{140}$   
 (A)  $\sqrt{7} + \sqrt{5}$  (B)  $\sqrt{7} - \sqrt{5}$   
 (C)  $\sqrt{7} + \sqrt{6}$  (D) Any other

**Q.49 :** Find G.C.D. of  $(13^{27} + 13^{28} + 13^{29})$  and  $(13^{45} + 13^{46} + 13^{47})$   
 (A)  $13^{45}$  (B)  $13^{27}$   
 (C)  $13^{27} \times 183$  (D)  $13^{45} \times 143$

**Q.50 :** Which of the following is a factor of  $79^3 + 105^3 - 72^3 - 98^3$   
 (A) 31 (B) 47  
 (C) 37 (D) 7

