

THE ASSOCIATION OF MATHEMATICS TEACHERS OF INDIA
Screening Test - GAUSS Contest

NMTC at PRIMARY LEVEL - V & VI Standards

Saturday, 1 September, 2018

Note:

1. Fill in the response sheet with your Name, Class and the institution through which you appear in the specified places.
2. Diagrams are only visual aids; they are NOT drawn to scale.
3. You are free to do rough work on separate sheets.
4. Duration of the test: 2 pm to 4 pm -- 2 hours.

PART—A

Note

- Only one of the choices A, B, C, D is correct for each question. Shade the alphabet of your choice in the response sheet. If you have any doubt in the method of answering, seek the guidance of the supervisor.
- For each correct response you get 1 mark. **For each incorrect response you lose $\frac{1}{2}$ mark.**

1. Observe the following sequence. What is the 100th term?

7, 8, 1, 0, 0, 1, 0, 1, 1, 0, 2, 1, 0, 3,

- (A) 1 (B) 0 (C) 2 (D) 3

Ans. (D)

2. A number is multiplied by 2 then by $\frac{1}{3}$, then by 4, then by $\frac{1}{5}$ then by 6 and finally by $\frac{1}{7}$. The

answer is 16. Then the number is

- (A) odd (B) even (C) Square (D) a cube

Ans. (A)

Sol. Let the number be x

$$x \times 2 \times \frac{1}{3} \times 4 \times \frac{1}{5} \times 6 \times \frac{1}{7} = 16$$

$$x = 35$$

3. Samrud bought a t- shirt for Rs.250. His friend Shlok wanted by buy it. Samrud wants to have a 10% profit on that. The selling price is (in rupees)

- (A) 280 (B) 278 (C) 276 (D) 275

Ans. (D)

Sol. C.P. = 250`

$$\text{Profit} = 10\%$$

$$\text{S.P.} = 250 + 250 \times \frac{10}{100}$$

$$\Rightarrow 250 + 25$$

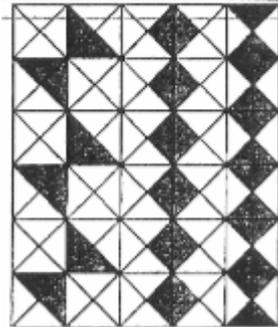
$$\text{selling price} = 275$$

4. The value of $1 + 21 + 41 + 61 + 81 - 11 - 31 - 51 - 71 - 91$ is
 (A) - 50 (B) 50 (C) 100 (D) - 100

Ans. (A)

Sol. $1 + 21 + 41 + 61 + 81 - 11 - 31 - 51 - 71 - 91$
 $\Rightarrow 1 - 11 + 21 - 31 + 41 - 51 + 61 - 71 + 81 - 91$
 $\Rightarrow (-10) + (-10) + (-10) + (-10) + (-10)$
 $\Rightarrow -50$

5. In the adjoining figure what portion of the figure is shaded ?



- (A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{4}$ (D) $\frac{3}{10}$
Ans. (D)

6. The sum of the numbers in the three brackets () is

$$\frac{()}{24} = \frac{20}{()} = \frac{24}{18} = \frac{4}{()}$$

- (A) 60 (B) 55 (C) 50 (D) 45
Ans. (C)

Sol. $\frac{(A)}{24} = \frac{20}{(B)} = \frac{24}{18} = \frac{4}{(C)} = \frac{4}{3}$

$A \rightarrow 32$
 $B \rightarrow 15$
 $C \rightarrow 3$
 $A + B + C \Rightarrow 50$

7. A is the smallest three digit number which leaves a remainder 2 when divided by 17. B is the smallest three digit number which leaves remainder 7. When divided by 12. Then A + B is
 (A) 205 (B) 312 (C) 215 (D) 207

Ans. (D)

Sol. Smallest three digit number leaves a remainder 2 when divided by 17 is $104 = A$
 Smallest three digit number leaves a remainder 7 when divided by 12 is $103 = B$
 $A + B = 104 + 103 = 207$

8. A square of side 3 cm is cut into 9 equal squares. Another square of side 4 cm is cut into 16 equal squares. Saket made a bigger square using all the smaller square bits. The length of the side of the bigger square is (in cm)

- (A) 7 (B) 6 (C) 5 (D) 8

Ans. (C)

Sol. $9 \text{ (squares)} + 16 \text{ (squares)} = 25 \text{ (squares)}$

$$\text{Length of side of the bigger square} = \frac{25}{5} = 5$$

9. A contractor constructed a big hall, rectangular in shape, with length 32 meters and breadth 18 meters. He wanted to buy 1 meter by 1 meter tiles. But in the shop 3 meter by 2 meter tiles only were available. How many tiles he has to buy for tiling the floor?

- (A) 48 (B) 96 (C) 120 (D) 126

Ans. (B)

Sol. Number of tiles required = $\frac{18}{3} \times \frac{32}{2} \Rightarrow 6 \times 16 = 96$

10. The fraction to be added to $2\frac{1}{3}$ to get the fraction $4\frac{4}{7}$ is

- (A) $2\frac{1}{21}$ (B) $2\frac{4}{21}$ (C) $2\frac{5}{21}$ (D) $2\frac{6}{21}$

Ans. (C)

Sol. $x + 2\frac{1}{3} = 4\frac{4}{7}$

$$x = \frac{32}{7} - \frac{7}{3}$$

$$x = \frac{96 - 49}{21}$$

$$x = \frac{47}{21}$$

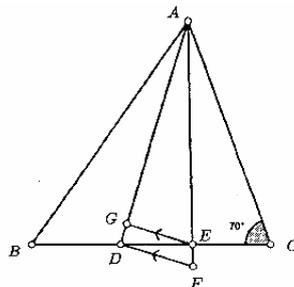
$$x = 2\frac{5}{21}$$

PART - B

Note :

- Write the correct answer in the space provided in the response sheet
- For each correct response you get 1 mark. For each incorrect response you lose $\frac{1}{4}$ marks.

11. In the adjoining figure $\angle BAD = \angle DAF = \angle FAC$. GE is parallel to DF, and $\angle EGA = 90^\circ$. If $\angle ACE = 70^\circ$, the measure of $\angle FDE$ is _____ . **(Bonus)**



12. ABC is a triangle in which the angles are in the ratio 3 : 4 : 5 . PQR is a triangle in which the angles are in the ratio 5 : 6 : 7. The difference between the least angle of ABC and the least angle of PQR is a° . Then $a =$ _____

Ans. 5

Sol. $3x + 4x + 5x = 180^\circ$

$$12x = 180$$

$$x = 15$$

Least angle of triangle ABC is $= 3 \times 15 = 45^\circ$

$$5x + 6x + 7x = 180^\circ$$

$$18x = 180^\circ$$

$$x = 10$$

Least angle of triangle PQR $= 5 \times 10 = 50$

$$\text{Difference } a^\circ = 50 - 45$$

$$a^\circ = 5$$

13. Samrud had to multiply a number by 35. By mistake he multiplied by 53 and got a result 720 more. The new product is _____.

Ans. 2120

Sol. Let the number be x

incorrect product $= x \times 53$

correct product $= x \times 35$

$$x \times 53 - x \times 35 = 720$$

$$18x = 720$$

$$x = 40$$

New product $x \times 53$

$$\Rightarrow 40 \times 53 = 2120$$

14. Vishva plays football every 4th day. He played on a Tuesday . He plays football on a Tuesday again in _____ days.

Ans. 28

Sol. Number of days in week $= 7$ days

Vishva plays football in $= 4$ days

He will play football on a tuesday again in $7 \times 4 = 28$ days

15. In an elementary school 26% of the students are girls. If there are 240 less girls than boys, then the strength of the school is _____

Ans. 500

Sol. Girls $= 26\%$

Boys $= 100 - 26 = 74\%$

Given $74\% - 26\% = 240$

$$48\% = 240$$

$$1\% = \frac{240}{48} \text{ students}$$

$$100\% = \frac{240}{48} \times 100$$

$$= 500 \text{ students}$$

16. There are three concentric circles as shown in the figure. The radii of them are 2 cm , 4 cm and 6 cm. The ratio of the area of the shaded region to the area of the dotted region is $\frac{a}{b}$ where a, b are integers and have no common factor other than 1. Then $a + b =$ _____



Ans. 8

Sol. $\frac{\text{Area of Shaded region}}{\text{Area of dotted region}} = \frac{a}{b}$

$$\frac{\pi(4)^2 - \pi(2)^2}{\pi(6)^2 - \pi(4)^2} = \frac{a}{b}$$

$$\frac{16 - 4}{36 - 16} = \frac{a}{b}$$

$$\frac{12}{20} = \frac{a}{b}$$

$$\frac{3}{5} = \frac{a}{b}$$

$$a + b = 5 + 3 = 8$$

17. The value of $\left(1 + \frac{1}{9}\right)\left(1 + \frac{1}{8}\right)\left(1 + \frac{1}{7}\right)\left(1 + \frac{1}{6}\right)\left(1 + \frac{1}{5}\right)\left(1 + \frac{1}{4}\right)\left(1 + \frac{1}{3}\right)\left(1 + \frac{1}{2}\right)$ is _____

Ans. 5

Sol.

$$\begin{aligned} & \left(1 + \frac{1}{9}\right)\left(1 + \frac{1}{8}\right)\left(1 + \frac{1}{7}\right)\left(1 + \frac{1}{6}\right)\left(1 + \frac{1}{5}\right)\left(1 + \frac{1}{4}\right)\left(1 + \frac{1}{3}\right)\left(1 + \frac{1}{2}\right) \\ &= \left(\frac{10}{9}\right)\left(\frac{9}{8}\right)\left(\frac{8}{7}\right)\left(\frac{7}{6}\right)\left(\frac{6}{5}\right)\left(\frac{5}{4}\right)\left(\frac{4}{3}\right)\left(\frac{3}{2}\right) \\ &= \frac{10}{2} = 5 \end{aligned}$$

18. When a two digit number divides 265, the remainder is 5. The number of such two digit numbers is

Ans. 6

Sol.

$$265 - 5 = 260$$

$$260 = 2 \times 2 \times 5 \times 13$$

two digits such numbers will be

$$\Rightarrow 1 \times 13 = 13$$

$$\Rightarrow 2 \times 13 = 26$$

$$\Rightarrow 2 \times 5 = 10$$

$$\Rightarrow 4 \times 5 = 20$$

$$\Rightarrow 4 \times 13 = 52$$

$$\Rightarrow 5 \times 13 = 65$$

6 Ans.

19. If $A \# B = \frac{A \times B}{A + B}$, the value of $\frac{12 \# 8}{8 \# 4} + \frac{10 \# 6}{6 \# 2}$ is _____

Ans. $\frac{43}{10}$

Sol.

$$\frac{12 \# 8}{8 \# 4} + \frac{10 \# 6}{6 \# 2} \Rightarrow \frac{24}{\frac{5}{3}} + \frac{15}{\frac{4}{3}}$$

$$\Rightarrow \frac{3 \times 3}{5} + \frac{30}{12}$$

$$\Rightarrow \frac{408 + 150}{60}$$

$$\Rightarrow \frac{258}{60}$$

$$\Rightarrow \frac{43}{10}$$

20. When water becomes ice, its volume increases by 10%. When ice melts into water its volume decreases by a%. Then a = _____.

Ans. $9\frac{1}{11}$

Sol. Let the volume of water = x unit cube

$$\text{Volume of ice} = x + \frac{x \times 10}{100} \Rightarrow \frac{11}{10}x \text{ unit cube}$$

$$\text{When ice melt to water its \% decrease in volume} = \frac{\frac{11x}{10} - x}{\frac{11}{10}x} \times 100$$

$$\Rightarrow \frac{\frac{1}{10}x}{\frac{11}{10}x} \times 100$$

$$a\% \Rightarrow 9\frac{1}{11}\%$$

**WINTER
WORKSHOP 2018**
For Class V to X

**WIN
CASH
REWARDS**

**SPECIAL
FEATURES**

- ▶ Target Oriented Classes
- ▶ Classes by experienced faculties.
- ▶ Doubt Solving facility.
- ▶ Mock test for academic evaluation.
- ▶ Various Activities

~ Targets ~



OLYMPIADS

Stage-1 & 2



NTSE

Stage-1 & 2



IJSO

Stage-1 & 2



BOARD

CBSE Board

Stage-1: 24 Dec to 30 Dec 2018 | 31 Dec to 06 Jan 2019

Stage-2 & Board: 24 Dec to 06 Jan 2019

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