RAMAGYA SCHOOL, NOIDA

CLASS-XI/ SUB- MATHEMATICS/2017-2018
OLYMPIAD PRACTICE WORKSHEET AUGUST

Section-1 - Logical Reasoning

(Application based questions)

1. A machine P can print one lakh books in 8 hours, machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. All the machines are started at 9 A.M. while machine P is closed at 11 A.M. and the remaining two machines complete work. Approximately at what time will the work (to print one lakh books) be finished?

(a) 11:30 AM (b)12 Noon (c) 12.30 PM (d) 1:00 PM

2. Sameer spends 24% of his monthly income on food and 15% on the education of his children. Of the remaining salary, he spends 25% on entertainment and 20% on conveyance. He is now left with Rs. 10736. What is the monthly salary of Sameer?

(a) 27600 (b) 28000 (c) 31200 (d) 32000

3. In an election between two candidates, 75% of the voters cast their votes, out of which 2% of the voters were declared in-valid. A candidate got 9261 votes which were75% of the total valid votes. The total number of voters enrolled in that election was:

(a) 16000 (b) 16400 (c) 16800 (d) 18000

4. Yogesh started a business investing Rs. 45000. After 3 months, Pranab joined him with a capital of Rs. 60000. After another 6 months, Atul joined them with a capital of Rs. 90000. At the end of the year, they made a profit of Rs. 20000. What would be Atuls share in it?

(a)Rs 7000 (b)Rs 6000 (c)Rs 5000 (d)Rs 4000

5. Four horses are tied on the four corners of a square field of 14m length so that each horse can just touch the other two horses. They were able to graze in the area accessible to them for 11days. For how many days is the un grazed area sufficient for them?

(a) 3days (b) 4days (c) 5days (d) 2 days

Section-2: Mathematical Reasoning

Concept based questions:

6. What is the nth term in the arithmetic series (3+7+11+15+19+.....)

(a) 4n (b) 4n+3 (c) 4n-1 (d) 2n+1

7. If 3 times the third term of an A.P. is equal to 5 times the fifth term. Then its 8th term is

(a) 0 (b) 1 (c) 2 (d) 3

8. If 1, a and P are in A. P. and 1, g and P are in G. P., then

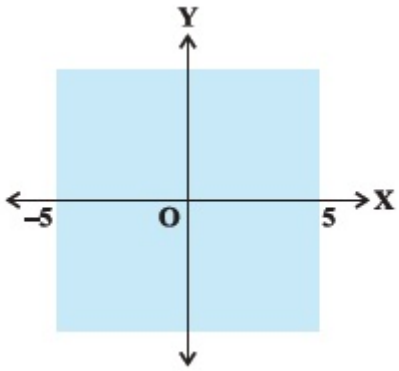
(a) $1 + 2a + g^2 = 0$ (b) $1 - 2a - g^2 = 0$

(c) $1 - 2a + g^2 = 0$ (d) $1 + 2a - g^2 = 0$

9. Given that x, y and b are real numbers and x<y, b<0, then

(a) $\frac{x}{b} < \frac{y}{b}$ (b) $\frac{x}{b} \leq \frac{y}{b}$ (c) $\frac{x}{b} > \frac{y}{b}$ (d) $\frac{x}{b} \geq \frac{y}{b}$

10. The inequality representing the following graph is



(a) $|x|<5$ (b) $|x|\leq 5$ (c) $|x|>5$ (d) $|x|\geq 5$

Value based questions:

11. A plumber can be paid under two schemes as given below:
I: Rs 600 and Rs 50 per hour.
II: Rs 170 per hour.
If the job takes n hours, then the values of n for which the scheme I will give the plumber better wages are
(a) less than 4 hours (b) less than 5 hours
(c) more than 5 hours (d) 4 hours

12. The sum of the series $1^2-2^2+3^2-4^2$ ..... is:
(a) 1225 (b) -1525 (c) 425 (d) 925

13. If the first, second and last term of an A.P. are *a*, *b* and 2*a* respectively, its sum is
(a) $\frac{ab}{2(b-a)}$ (b) $\frac{ab}{b-a}$
(c) $\frac{3ab}{2(b-a)}$ (d) none of these

14. In the first four examinations, each of 100 marks, Dipika got 94, 73, 72, 84 marks. If a final average greater than or equal to 80 and less than 90 is needed to obtain a final grade B in a course, then the range of marks, Dipika must score in the fifth examination in order to obtain grade B is
(a) 77 < x < 127 (b) 77 ≤ x < 100 (c) 77 ≤ x < 127 (d) 77 < x < 127

15. The third term of a G.P. is 3, the product of first five terms of this progression is:
(a) 81 (b) 27 (c) 243 (d) The information is not sufficient.

HOTS:

16. The cost and revenue functions of a product are given by C(x) = 2x + 400 and R(x) = 6x + 20 respectively, where x is the number of items produced by the manufacturer. The minimum number of items that the manufacturer must sell to realize some profit is
(a) 95 (b) 96 (c) 100 (d) 105

17. A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is to be 6 cm longer than the shortest and the third length is to be thrice as long as the shortest. If the third piece is to be at least 4 cm longer than the second, then the length of the shortest board will lie between
(a) 8 cm and 22 cm (b) 6 cm and 19 cm (c) 7 cm and 21 cm (d) 5 cm and 17 cm

18. Sum to 20 terms of the series $1.3^2+2.5^2+3.7^2+¿$ ..... is:
(a) 168090 (b) 198090 (c) 178090 (d) 188090

19. If the sum of first n even natural number is equal to k times the sum of first n odd natural number then value of k will be
(a) $\frac{1}{n}$ (b) $\frac{n-1}{n}$
(c) $\frac{n+1}{2n}$ (d) $\frac{n+1}{n}$

20. Sum of *n* terms of the series $\sqrt{2}+\sqrt{8}+\sqrt{18}+\sqrt{32}\ldots$ is

(a) 1

(b) $\frac{n(n+1)}{\sqrt{2}}$

(c) $\frac{n(n+1)}{2}$

(d) $2n(n+1)$