Olympiad Foundation

SAMPLE PAPER CLASS 11th

OLYMPIAD FOUNDATION

MATHEMATIC OLYMPIAD

Division of Marks

S.No.	Topic/Section	No. of Question	Marks
1	ALGEBRA	10	10
2	CALCULUS	10	10
3	TRIGONOMETRY	10	10
4	ACHIEVER SECTION	02	10
5	REASONING	10	10
	TOTAL	42	50

INSTRUCTIONS :

1. Use Blue/Black ballpoint pen only to darken the appropriate circle.
2. Mark should be dark and should completely fill the circle.
3. Dark only one circle for each entry.
4. Dark the circle in the space provided only.
5. Rough work must not be done on the answer sheet and do not use white- fluid or any other rubbing material on Answer sheet.
6. Each question carries one mark.

TIME: 1 Hour M.M.: 50

Select the correct answer and darken your answer in the table :

ALGEBRA

1. Express the following expression in the form of a+ib; $\left(\frac{3 + i\sqrt{5}}{\sqrt{3} + \sqrt{2}i}\right) - \frac{(3 - i\sqrt{5})}{(\sqrt{3} - i\sqrt{3})}$ and choose the correct option.

   (A) $0 + \frac{7\sqrt{2}}{2\sqrt{2}}$ (B) $0 - \frac{7\sqrt{3}i}{2}$

   (C) $\frac{7\sqrt{3}i}{2}$ (D) o i

2. Find the Modulus of $\frac{1 + i}{1 - i}$ & choose the correct option :

   (A) 1 (B) 2

   (C) -1 (D) -2

3. The value of x for $\frac{3x - 4}{2} \geq \frac{x + 1}{4}$ -1

   (A) $x \leq 1$ (B) $x < 1$

   (C) $x \geq 1$ (D) $x > 1$

4. Solve $24x < 100$ & choose the correct option ;

   (A) $x < 4.15$ (B) $x = 4.15$

   (C) $x > 4.15$ (D) $x \geq 4.15$

5. The polar form of complex number $z = 1 + i\sqrt{3}$ is ;

   (A) $\cos\frac{\pi}{3} + 2\, i \sin\frac{\pi}{3}$ (B) $2\left(\cos\frac{\pi}{3} + i \sin\frac{\pi}{3}\right)$

   (B) 0 (D) $-1\left(\cos\frac{\pi}{3} - i \sin\frac{\pi}{3}\right)$

6. Solve $\sqrt{2}x2 + x + \sqrt{2} = 0$ & choose the correct option ;

   (A) 0 (B) -1

   (C) $\frac{-1 \pm \sqrt{7}i}{2\sqrt{2}}$ (D) $\frac{-1 + \sqrt{7}i}{2\sqrt{2}}$

7. If $x^2 = 9$ $y^2 = 25$ then x + y is ;

   (A) 3 (B) 8 (C) 2 (D) 0

8. If $x^2 = 36$ then x is ;

(A) 6 (B) 3 (c) 5 (D) 7

9. If $x^2 = 49$, y = 7 then $\sqrt{xy}$ is ;

(A) 49 (B) 849 (C) 72 (D) 75

10. If $(x + y)^2 = x^2 + 2xy + y^2$ and $(x - y)^2 = x^2 - 2xy + y^2$ then $(x + y)^2 - (x - y)^2$ is ;

(A) $2x^2 + 2y^2$ (B) 2xy (C) 4xy (D) xy

CALCULUS

11. If x & y are two sets such that n(x) = 17, n(y) = 23, n(xuy) = 38 then f(xny) = ?

(A) 2 (B) 5 (C) 1 (D) 0

12. If n(x) = 8 n(y) = 15 then n(xny) = ? n(xuy) = 18

(A) 3 (B) 4 (C) 5 (D) 0

13. If A = { 1, 2, 3, _ _ , 14 } then R = { (x,y) : 3x -y = 0 x, yEA }, Then domain is ;

(A) { 1,2 } (B) { 1, 2, 3, 4 } (C) { 4,3 } (D) { 2,3 }

14. If A = { 1, 2, 3 } B = { 2, 3 } then A∩B is ;

(A) { 2,3 } (B) { 1,3 } (C) { 1,2,3 } (D) { 2,4 }

15. If $t(C) = \frac{9c}{5} + 32$ then t (-10) is ;

(A) 7 (B) 28 (C) 14 (D) 0

16. The Radian Measure is -4 then the degree measure is ;

(A) 306°5'30" (B) -229°5'29"

(C) -200°5'30" (D) 220°5'30"

17. If $(x+y)(x-y) = x^2 - y^2$ and x = 3, y = 5 then the value of $x^2 - y^2$ is;

(A) -16 (B) 16 (C) 216 (D) 15

18. If $y^2 = 12x$, then the coordinate of focus is ;

(A) (3,0) (B) (0,3) (C) (12,0) (D) (0,1)

19. If vertex (0,0), focus (3,0), then eq^{n} of parabola is ;

(A) $x^2 = 12y$ (B) $x^2 = 12\ y$ (C) $y^2 = \sqrt{12}x$ (D) $y^2 = \sqrt{12}x$

20. If focus (0, -3), directrix y = 3 then the eqn of parabola is ;

(A) $x^2 = 12y$ (B) $x^2 = -12y$ (C) $x^2 = 12$ (D) $x^2 = \sqrt{12}y$

TRIGONOMETRY

21. If cos x = -3/5, $x \in$ 3rd quadrant then the value of Sinx.

(A) 4/3 (B) 4 (C) -4/5 (D) 3/2

22. The form of tan (x+y) is ;

(A) $\frac{\tan x + \tan y}{1 - \tan x \tan y}$ (B) $\frac{1 + \tan x \tan y}{\tan x - \tan y}$

(C) $\frac{\tan x - \tan y}{1 + \tan x \tan y}$ (D) $\frac{\tan y + \tan x}{\tan x \tan y - 1}$

23. The value of $\sin^2\frac{\pi}{6} + \cos^2\frac{\pi}{3} - \tan^2\frac{\pi}{4}$ is ;

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

24. The value of tan 15 is ;

(A) $2+\sqrt{3}$ (B) $2-\sqrt{3}$ (C) 2 (D) 1

25. The solution of $\sin x = \frac{-\sqrt{3}}{2}$ is ;

(A) $x = n\pi + (-1)^n \frac{4\pi}{3}$; $n \in z$ (B) $x = n\pi + \frac{4\pi}{3}$; $n \in z$

(C) $x = 2n\pi + \frac{4\pi}{3}$; $n \in z$ (D) $x = 2n\pi - \frac{4\pi}{3}$; $n \in z$

26. The value of $2\sin^2 3\frac{\pi}{3} + 2\cos^2\frac{\pi}{3} + 2\sec^2\frac{\pi}{3}$ is ;

(A) 0 (B) 2 (C) 5 (D) 10

27. The value of $\frac{\text{Cos } 7x + \text{Cos } 5x}{\text{Sin } 7x - \text{Sin } 5x}$ is ;

(A) Sin 7x (B) Cos x

(C) Tan x (D) Cot x

28. The form of Sin 2x is ;

(A) $\frac{2 \tan x}{1 - \tan^2 x}$ (B) $\frac{2 \tan x}{1 + \tan^2 x}$

(C) $\frac{2 \tan x}{\sqrt{1+ x^2}}$ (D) $\frac{2 \tan x}{\sqrt{1- x^2}}$

29. In 4th quadrant ɵ lies from ;

(A) $(\pi, 2\pi)$ (B) $(0, \pi)$

(C) $(3\pi/2, 2\pi)$ (D) $(0, -\pi)$

30. In 2nd quadrant the values of Sin x, Cosec x are ;

(A) +ve (B) -ve (C) 0 (D) 1

ACHIEVER SECTION

31. Find (a+b) - (a-b). Hence evaluate $(\sqrt{3} + \sqrt{2})^4 - (\sqrt{3} - \sqrt{2})^4$

(A) $\sqrt{6}$ (B) 0

(C) 40 (D) $40\sqrt{6}$

32. How many terms of the G.P. 3, 3/2, 3/4, ____ are heeded to give the sum 3069/512 ?

(A) n = 10 (B) n = 20 (C) n = 5 (D) n = 25

REASONING

33. If + = x, - = /, / = -, x = + then the value of (7P3) y 6x5 ?

(A) 20 (B) 5 (C) 10 (D) 15

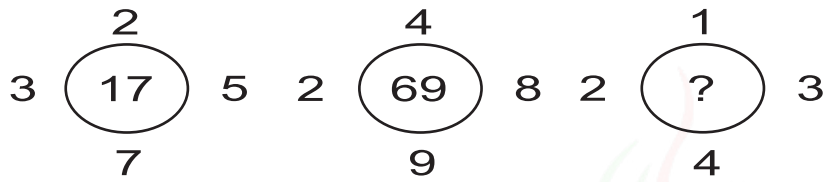
34. Select the next letter ;
D E G J N S_____

(A) X (B) Y (C) V (D) U

35. Find the missing term ;
1, 3, 7, 2, 6, 10, 3, _____?

(A) 8 (B) 7 (C) 9 (D) 12

36. Find the missing term ;



(A) 10 (B) 20 (C) 30 (D) 50

37. Complete the series ;
aba - baca - ba - bacaaba

(A) cacb (B) ccab (C) Cabc (D) abcb

38. Find the missing term ;
4, 5, 9, 18, 34, _____

(A) 43 (B) 49 (C) 50 (D) 59

39. Which is odd one out ?

(A) 15/16 (B) 11/13 (C) 2/3 (D) 4/7

40. Find the missing term :
42 : 56 : : 72 : _____ ?

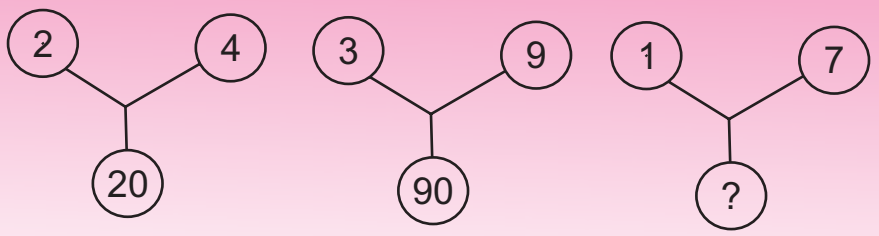
(A) 81 (B) 90 (C) 92 (D) 100

41. Which of the following is the same as Norway, Poland, Spain ?

(A) Chandigarh (B) Baroda

(C) Lucknow (D) Bokaro

42. Find the missing term ;



(A) 20 (B) 25 (C) 50 (D) 75

ANSWER KEY

1.	B	11.	A	21.	C	31.	D	41.	D
2.	B	12.	C	22.	A	32.	A	42.	C
3.	C	13.	B	23.	A	33.	D		
4.	A	14.	A	24.	B	34.	B		
5.	B	15.	C	25.	A	35.	C		
6.	C	16.	B	26.	D	36.	D		
7.	B	17.	A	27.	D	37.	A		
8.	A	18.	A	28.	B	38.	D		
9.	A	19.	C	29.	C	39.	B		
10.	C	20.	B	30.	A	40.	B		