



GG RS LEARNING HUB PVT. LTD.

### IMO Class 10

Total Questions: 35

Time: 60 min

- If  $\alpha$  and  $\beta$  are the zeroes of the quadratic polynomial  $f(x)=x^2-p(x+1)-c$ , then the value of  $(\alpha+1)(\beta+1)$  is:  
a) c      b)  $1-c$   
c)  $c-1$       d)  $1+c$
- If  $\sin\theta+\cos\theta=3$ , then the value of  $\tan\theta+\cot\theta$  is:  
a) 1   b) 3   c) 2   d)  $1/3$
- The vertices of a triangle are  $A(0, 6)$ ,  $B(-5, 3)$ , and  $C(3, 1)$ . What is the length of the median from vertex A?  
a) 13      b) 15  
c) 4      d) 5
- If the sum of the first 'n' terms of an Arithmetic Progression is given by  $S_n = 3n^2 - 4n$ , what is its 10th term?  
a) 53      b) 59  
c) 260      d) 11
- Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops?  
a) 11 m      b) 12 m  
c) 13 m      d) 17 m
- A solid metallic sphere of radius 10 cm is melted and recast into smaller cones, each of radius 5 cm and height 2 cm. How many such cones can be made?  
a) 200      b) 240  
c) 250      d) 80
- If the roots of the equation  $(a-b)x^2+(b-c)x+(c-a)=0$  are equal, which of the following is true?  
a)  $a+c=2b$    b)  $a^2+c^2=2b^2$   
c)  $2a=b+c$    d)  $b^2=ac$
- From the top of a 7 m high building, the angle of elevation of the top of a tower is  $60^\circ$  and the angle of depression of its foot is  $45^\circ$ . What is the height of the tower?  
a)  $7(1+3)$  m      b) 73 m  
c) 143 m      d) 14 m
- In a circle with center O, PA and PB are tangents from a point P. If the angle APB is  $80^\circ$ , what is the angle AOB?  
a)  $80^\circ$       b)  $90^\circ$   
c)  $100^\circ$       d)  $120^\circ$
- A single letter is selected at random from the word "PROBABILITY". What is the probability that it is a vowel?  
a)  $3/11$       b)  $4/11$   
c)  $5/11$       d)  $2/11$
- For what value of 'k' will the pair of linear equations  $3x+y=1$  and  $(2k-1)x+(k-1)y=2k+1$  have no solution?  
a) 1      b) 2  
c) -1      d) -2



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12. The area of a sector of a circle with a radius of 14 cm is  $154 \text{ cm}^2$ . What is the angle of the sector?
- a)  $60^\circ$       b)  $75^\circ$   
c)  $90^\circ$       d)  $120^\circ$
13. If the mean of the data: 10, 12, 18, 13, P, 17 is 15, what is the median?
- a) 13      b) 14  
c) 15      d) 16
14. In triangle ABC, DE is parallel to BC. If  $AD = x$ ,  $DB = x-2$ ,  $AE = x+2$ , and  $EC = x-1$ , what is the value of  $x$ ?
- a) 3    b) 4    c) 5    d) 6
15. If  $4\tan\theta=3$ , what is the value of  $4\sin\theta+\cos\theta$ ?
- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$   
c)  $\frac{2}{3}$       d)  $\frac{3}{4}$
16. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. What is the speed of the stream?
- a) 3 km/h      b) 5 km/h  
c) 8 km/h      d) 11 km/h
17. If the points A(6, 1), B(8, 2), C(9, 4), and D(p, 3) are the vertices of a parallelogram, taken in order, what is the value of p?
- a) 5      b) 6    c) 7    d) 8
18. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 7 cm and the height of the cone is equal to its diameter. What is the volume of the solid?
- a)  $1078 \text{ cm}^3$       b)  $1540 \text{ cm}^3$   
c)  $2310 \text{ cm}^3$       d)  $1232 \text{ cm}^3$
19. If the sum of the zeroes of the polynomial  $f(x)=x^2-8x+k$  is 40, what is the value of k?
- a) 10      b) 12  
c) 16      d) 24
20. In an equilateral triangle ABC, D is a point on side BC such that  $BD = \frac{1}{3}BC$ . What is the ratio of  $9AD^2$  to  $AB^2$ ?
- a) 7:1      b) 1:7  
c) 9:7      d) 7:9
21. If  $\text{HCF}(306, 657) = 9$ , what is  $\text{LCM}(306, 657)$ ?
- a) 22338      b) 22383  
c) 23238      d) 23283
22. What is the area of the triangle formed by the lines  $y = x$ ,  $x = 6$ , and  $y = 0$ ?
- a) 12 sq. units      b) 18 sq. units  
c) 24 sq. units      d) 36 sq. units
23. The value of  $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 180^\circ$  is:
- a) 1    b) 0    c) -1    d)  $\frac{1}{2}$
24. A card is drawn from a well-shuffled deck of 52 cards. What is the



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- probability of getting neither a red card nor a queen?
- a)  $\frac{6}{13}$     b)  $\frac{7}{13}$   
c)  $\frac{1}{4}$     d)  $\frac{1}{2}$
25. If the  $n$ th term of an AP is  $(2n+1)$ , what is the sum of its first 10 terms?
- a) 100    b) 110  
c) 120    d) 130
26. The circumference of a circle is 100 cm. What is the side of a square inscribed in the circle?
- a)  $\frac{50}{\pi}$  cm    b)  $\frac{502}{\pi}$  cm  
c)  $\frac{100}{\pi}$  cm    d)  $\frac{1002}{\pi}$  cm
27. If  $x = a \cos \theta$  and  $y = b \sin \theta$ , what is the value of  $b^2 x^2 + a^2 y^2$ ?
- a)  $ab$     b)  $a^2 b^2$   
c)  $a^2 + b^2$     d) 1
28. For a quadratic equation  $ax^2 + bx + c = 0$  with rational coefficients, if one root is  $3+2i$ , what is the value of  $(a+b+c)/a$ ?
- a) 2    b) 4  
c) -4    d) 7
29. ABC is an isosceles triangle right-angled at C. What is the value of  $AB^2$ ?
- a)  $AC^2$     b)  $2AC^2$   
c)  $3AC^2$     d)  $4AC^2$
30. What is the number of zeroes of the polynomial whose graph is given below?
- a) 1    b) 2    c) 3    d) 4
31. A motorboat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. What is the speed of the stream?
- a) 4 km/h    b) 6 km/h  
c) 8 km/h    d) 10 km/h
32. In a class, the sum of the ages of all students is 2240 years, and the average age is 14 years. If 6 new students join, the average age becomes 13.5 years. What is the sum of the ages of the new students?
- a) 81 years    b) 126 years  
c) 141 years    d) 160 years
33. The ratio of the volume of a cube to that of a sphere which will fit inside the cube is:
- a)  $4:\pi$     b)  $4:3\pi$   
c)  $6:\pi$     d)  $2:\pi$
34. The coordinates of the point which divides the line segment joining the points (4, -3) and (8, 5) in the ratio 3:1 internally are:
- a) (7, 3)    b) (6, 1)  
c) (5, 2)    d) (3, 7)
35. The value of  $(\sec A + \tan A)(1 - \sin A)$  is:
- a)  $\sin A$     b)  $\cos A$   
c)  $\sec A$     d)  $\operatorname{cosec} A$