1. Write down the information required in the spaces provided in the Answer Sheet.

2. When told to open this question paper, check that all the questions are there. Look for the words ‘END OF PAPER’ after the last question.

3. ANSWER ALL QUESTIONS. All the answers should be marked on the Answer Sheet.

4. Note that you may marks only ONE answer to each question. Two or more answers will score NO MARK.

5. All questions carry equal marks. No mark will be deducted for wrong answers.
1. In the figure, find the value of $a$.
   A. $5\sqrt{3}$
   B. 10
   C. $10\sqrt{3}$
   D. $10\sqrt{3}$

2. Simplify $8 - 8\sin^2\theta$.
   A. $\sin^2\theta$
   B. $\cos^2\theta$
   C. $8\sin^2\theta$
   D. $8\cos^2\theta$

3. Simplify $\left(\frac{22}{3b}\right)^3 = (\frac{4a^3}{3b})^2$.
   A. $\frac{1}{2a^2b^3}$
   B. $\frac{1}{6a^2b^3}$
   C. $\frac{1}{6a^2b^5}$
   D. $\frac{128a^2}{243b^8}$

4. Solve the exponential equation $8^x = 4096$
   A. 2
   B. 3
   C. 6
   D. 27

5. If the vertices of $\triangle ABC$ are $A(1, 1)$, $B(4, 4)$ and $C(5, 2)$, what type of triangle is $\triangle ABC$?
   A. An isosceles triangle
   B. An equilateral triangle
   C. A scalene triangle
   D. It cannot be determined.
6. The figure shows a straight line \( L \) pass through \((3,0)\). Which of the following is correct?

A. Equation of \( L \): \( y = 0 \)
B. Equation of \( L \): \( y = 3 \)
C. Equation of \( L \): \( x = 0 \)
D. Equation of \( L \): \( x = 3 \)

7. A straight line with slope \(-2\) intersects the \( x\)-axis and the \( y\)-axis at \( A(a, 0) \) and \( B(0, b) \) respectively. If \( O \) is the origin, find the area of \( \Delta AOB \).

A. \( \frac{1}{2}b^2 \)
B. \( b^2 \)
C. \( \frac{1}{2}a^2 \)
D. \( a^2 \)

8. If the line passing through \( A(3, -5) \) and \( B(c, 5) \) is perpendicular to the line \( L: x - 2y = 9 \), find the value of \( c \).

A. 1
B. -1
C. -2
D. -3

9. \( L_1 \) passes through \( A(x, 5) \) and \( B(-3, 1) \). \( L_2 \) passes through \( C(-3, 7) \) and \( D(2, y) \). \( L_3 \) passes through \( E(-4, -3) \) and \( F(2, 3) \). If \( L_2 \perp L_1 \) and \( L_3 \parallel L_2 \), find the values of \( x \) and \( y \).

A. \( x = -7, y = 2 \)
B. \( x = -1, y = 2 \)
C. \( x = 1, y = 2 \)
D. \( x = 1, y = 12 \)

10. If a certain number is reduced by 20\%, it becomes 60. Find the number.

A. 12
B. 48
C. 75
D. 80
11. If the following net is folded up to form a regular polyhedron, what kind of solid will you get?

A. Regular tetrahedron  
B. Regular hexahedron  
C. Regular octahedron  
D. Regular dodecahedron

12. In the figure, $ABCD$ is a trapezium and $BC = 24\text{cm}$ Find the area of trapezium $ABCD$.

![Trapezium Diagram]

A. $288 \text{ cm}^2$  
B. $243 \text{ cm}^2$  
C. $162 \text{ cm}^2$  
D. $81 \text{ cm}^2$

13. The figure shows a parallelogram $ABCD$. Find $x$.

![Parallelogram Diagram]

A. $\frac{2}{7}$  
B. $\frac{1}{3}$  
C. 3  
D. 7
14. The figure shows a square. Find the area of the square.

A. 2025
B. 1350
C. 180
D. 45

15. In the figure, $ACD$ and $BCE$ are straight lines, $AB // ED$. Which of the following must be correct?

I. $a = e$
II. $a + b = d + e$
III. $a + b + c = 180^\circ$

A. I and II only
B. I and III only
C. II and III only
D. I, II and III

16. In the figure, $ABD$, $ACE$ and $BCG$ are straight lines and $AB = AC$. If $z = 110^\circ$, find $x$ and $y$.

A. $x = 70^\circ$, $y = 70^\circ$
B. $x = 40^\circ$, $y = 70^\circ$
C. $x = 70^\circ$, $y = 40^\circ$
D. $x = 110^\circ$, $y = 70^\circ$

17. In the figure, $\mathcal{O}$ is the

A. incentre of $\triangle ABC$.
B. circumcentre of $\triangle ABC$.
C. centroid of $\triangle ABC$.
D. orthocentre of $\triangle ABC$. 

- 5 -
18. The figure shows a right-angled triangle $\triangle ADE$. $\angle ADE = 90^\circ$, $AB = 7 \text{ cm}$ and $BC = 4 \text{ cm}$. If $\triangle ABC = 14 \text{ cm}^2$, find area of $\triangle ADE$.

A. $28 \text{ cm}^2$
B. $56 \text{ cm}^2$
C. $96 \text{ cm}^2$
D. $112 \text{ cm}^2$

19. In the figure, $ACF$, $BCE$ and $BDF$ are straight lines. Find $x : y$.

A. $24 : 11$
B. $12 : 11$
C. $6 : 11$
D. $1 : 1$

20. In the figure, $ABC$ is a triangle. $D$ and $E$ are points on $AB$ and $AC$ respectively. If $EC = 13 \text{ cm}$ and $BC = 20 \text{ cm}$, find the area of $\triangle ADE$.

A. $130 \text{ cm}^2$
B. $65 \text{ cm}^2$
C. $120 \text{ cm}^2$
D. $60 \text{ cm}^2$
21. In the figure, $ACE$ and $BDF$ are straight lines. Find $p$.

A. 25  
B. 20  
C. 15  
D. 10

22. If the principal is $8,000 and the simple interest rate is 6% p.a., find the amount after 3 years.

A. $1,440  
B. $9,440  
C. $9,340  
D. $10,400

23. Factorize $5ab - bc + 2cd - 10ad$.

A. $(b + 2d)(c - 5a)$  
B. $(b - 2d)(5a - c)$  
C. $(2b + d)(c - 5a)$  
D. $(2b + d)(5a - c)$

24. Factorize $2a^2 - 16b^2$.

A. $(2a - 4b)^2$  
B. $(2a - b)(a^2 - ab - 16b^2)$  
C. $2(a - 2b)(a^2 + 2ab + 4b^2)$  
D. $2(a - 2b)(a^2 - 2ab + 4b^2)$

25. Find $x$.

A. $x = 20^\circ$  
B. $x = 50^\circ$  
C. $x = 25^\circ$  
D. $x = 60^\circ$
26. In the figure, $BCDE$ is a straight line, $BC = FE$, $MC = ME$ and $AD = BF$. Which of the following must be correct?

I. $AIEC = AED$
II. $AICB = AFEE$
III. $ABDB = ABF$

A. I only
B. II only
C. I and II only
D. I, II and III

27. The mean of 5, 9, 11, 12 and $n$ is 10. Find the value of $n$.

A. 7
B. 10
C. 13
D. 27

28. The table below shows the marks of a group of students in a Mathematics test. Find the mean mark.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 9</td>
<td>6</td>
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<tr>
<td>10 - 19</td>
<td>2</td>
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<tr>
<td>20 - 29</td>
<td>1</td>
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<td>30 - 39</td>
<td>3</td>
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<td>40 - 49</td>
<td>8</td>
</tr>
</tbody>
</table>

A. 25
B. 27
C. 27.5
D. 28
29. A bag contains 12 cards which are marked with numbers from 1 to 12. If a card is drawn at random, what is the probability of getting a King?

A. \( \frac{1}{2} \)
B. \( \frac{1}{6} \)
C. \( \frac{1}{12} \)
D. 0

30. A bag contains 5 red balls and 6 green balls. If a red ball is drawn without replacement and then a green ball is drawn without replacement, what is the probability of getting a red ball at random in the third draw?

A. \( \frac{4}{9} \)
B. \( \frac{5}{9} \)
C. \( \frac{5}{11} \)
D. \( \frac{6}{11} \)

31. There are some drinks in a refrigerator, 15 of them are Coke (C). If a drink is taken at random, the probability of taking a Coke is \( \frac{5}{11} \). What is the total number of drinks in the refrigerator?

A. 12
B. 17
C. 22
D. 33

32. Two fair dice are tossed together. Find the probability that the sum is 10.

A. 0
B. \( \frac{1}{36} \)
C. \( \frac{1}{18} \)
D. \( \frac{1}{12} \)
33. Two dice were tossed many times. The sums of the two numbers obtained are recorded as follows:

<table>
<thead>
<tr>
<th>Sum</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>19</td>
<td>17</td>
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<td>25</td>
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</tbody>
</table>

What is the experimental probability that the sum was 9?

A. \( \frac{17}{250} \)
B. \( \frac{19}{250} \)
C. \( \frac{9}{125} \)
D. \( \frac{9}{251} \)

34. In the figure, the top and the base of the right frustum are rectangles. Find the volume of the frustum.

A. \( \frac{127}{3}abh \)
B. \( \frac{112}{3}abh \)
C. \( 150abh \)
D. It cannot be found.

35. Find the surface area of a solid hemisphere of radius 6 cm.

A. \( 81\pi \) cm\(^2\)
B. \( 108\pi \) cm\(^2\)
C. \( 256\pi \) cm\(^2\)
D. \( 324\pi \) cm\(^2\)

36. In the figure, find the height of point \( A \) above the ground.

A. \( \frac{\sqrt{3}}{2}a + \frac{\sqrt{3}}{2}b \)
B. \( \frac{\sqrt{5}}{2}a + \frac{1}{2}b \)
C. \( \frac{\sqrt{2}}{2}a + \frac{\sqrt{2}}{2}b \)
D. \( \frac{1}{2}a + \frac{1}{2}b \)
37. The figure shows a map of the scale 1 : 20 000, where \( AB = 0.4 \) cm. Find the angle of inclination of the line \( AB \). (Correct your answer to 3 significant figures.)
   A. \( 3.6^\circ \)
   B. \( 32.0^\circ \)
   C. \( 42.1^\circ \)
   D. \( 86.4^\circ \)

38. In the figure, \( ABC \) is the horizontal level. What is the angle of depression of the point \( A \) from the bird? (Correct your answer to 3 significant figures.)
   A. \( 37.4^\circ \)
   B. \( 39.5^\circ \)
   C. \( 51.0^\circ \)
   D. \( 52.6^\circ \)

39. Given that the vertices of square \( ABCD \) are \( A(-4, -5) \), \( B(6, -5) \), \( C(6, 5) \) and \( D(-4, 5) \), find the coordinates of the centre \( P \) of square \( ABCD \).
   A. \( (0, 1) \)
   B. \( \left(\frac{1}{2}, \frac{1}{2}\right) \)
   C. \( (1, -5) \)
   D. \( (1, 0) \)

40. In the figure, find the perimeter of the rectangle \( ABCD \). (Correct your answer to 3 significant figures.)
   A. \( 54.6 \)
   B. \( 40 \)
   C. \( 69.3 \)
   D. \( 100 \)

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