General Instructions:

- The question paper consists of 35 questions divided into 4 sections A, B, C and D. Section A comprises of 10 questions of 1 mark each. Section B comprises of 7 questions of 3 marks each. Section C comprises of 12 questions of 4 marks each. Section D comprises of 6 questions of 7 marks each.
- In Section - A all questions are compulsory. In Section – B solve any 5 questions. In Section – C solve any 10 questions and in Section – D solve any 5 questions.
- Draw neat diagrams wherever needed.

SECTION – A (Attempt all questions)

Q.1 The difference between the highest and the lowest values of a set of data is called________.

Q.2 The product of \( \left( -\frac{4}{9} \right), (x^4y), (xy^3) \) and \( (x^3y^2) \) is______.

Q.3 How many faces and edges does a triangular prism have?

Q.4 TSA of a prism = LSA + 2 x ______.

Q.5 Write 0.0000507 in standard form.

Q.6 A pipe that fills 25% of a tank in 1 hour will fill it completely in ______ hours.

Q.7 \( 4x^2 - 9y^2 = ? \)

Q.8 A point with y coordinate zero will lie on _____ axis.

Q.9 If 62y3 is a multiple of 3, where y is a single digit then what should be the minimum and maximum value of y?

Q.10 A number divisible by both 2 and 5 must have ____ in its ones place.

SECTION – B (Attempt any five questions)

Q.11 Evaluate using suitable identity: 1.05 × 9.5.

Q.12 Simplify: 3y(2y – 7) – 3(y – 4) – 63 and evaluate for y = – 2.

Q.13 Draw the top, side and front view of the given figure.

SECTION – C (Attempt any ten questions)

Q.14 Find the length of the altitude of a rhombus if lengths of its two diagonals are 12cm and 16cm respectively.

Q.15 Evaluate : \( (6^{-1} – 7^{-1})^{-1} – (5^{-1} – 4^{-1})^{-1} \).

Q.16 Write Euler’s formula, then find the number of faces in a solid if the number of vertices is 8 and number of edges is 12.

Q.17 In a stack there are 5 books each of thickness 20mm and 5 paper sheets each of thickness 0.016mm. What is the total thickness of the stack? Write in standard form.

SECTION – D (Attempt any five questions)

Q.18 12 cards numbered 1,2,3,……11,12 are kept in a box and mixed thoroughly. If one
card is drawn at random, find the probability of getting a card with:

i) a prime number  
ii) a factor of 12  
iii) a number divisible by 3  
iv) a multiple of 2

Q.19 Evaluate without actual multiplication:

(i) $98 \times 102$  
(ii) $(105)^2$

Q.20 Simplify:

(i) $(5x - 6)(2x - 3) + (3x + 5)^2$  
(ii) $(2x + 5y)(2x + 3y)$

Q.21 Verify Euler's formula for the given solid.

Q.22 Find the volume of a cube if its total surface area is 150cm$^2$.

Q.23 a) Find $m$ so that $(-3)^{m+1} \times (-3)^5 = (-3)^7$

b) Find the value of $(3^0 + 4^{-1}) \times 2^2$

Q.24 A 5m 60cm high pole casts a shadow of length 3m 20cm.

a) Find at the same time the length of a shadow cast by another pole 10m 50cm high.

b) Find the height of the pole if the length of the shadow is 6m 40cm.

Q.25 Factorise:

a) $m^4 - 256$  
b) $x^2 + xy + 8x + 8y$

Q.26 a) Find the highest common factor of $16x^2, -4x^2, 32x$.

b) Factorise $x^2 - 14x + 13$

Q.27 Given below is the histogram showing the weights of 36 students of a hostel:

Answer the following:

i) What is the class size?

ii) How many students are there in the class intervals of weights 40-70 and 80-90?

iii) How many students weigh 70 kg or more?

Q.28 An aquarium is in the form of a cuboid whose external measures are 80 cm x 30 cm x 40 cm. The base, side faces and back face are to be covered with the coloured paper. Find the area of paper needed.
Q.29 Work out the following divisions:
(i) \( (7x^2 + 14x) \div (x + 2) \)
(ii) \( 5pq \div (p^2 - q^2) \div 2p \div (p + q) \)

SECTION – D (Attempt any five questions)

Q.30 On a particular day, the sales (in rupees) of different items of a baker’s shop are given below. Draw a pie chart for this data:

<table>
<thead>
<tr>
<th>Item</th>
<th>Sales (in rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary bread</td>
<td>320</td>
</tr>
<tr>
<td>Fruit</td>
<td>80</td>
</tr>
<tr>
<td>Cakes and pastries</td>
<td>160</td>
</tr>
<tr>
<td>Biscuits</td>
<td>120</td>
</tr>
<tr>
<td>Others</td>
<td>40</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>720</strong></td>
</tr>
</tbody>
</table>

Q.31 Diagram of the given picture frame has outer dimensions as 24cm × 28cm and inner dimensions as 16cm × 20cm. Find the area of each section of the frame, if the width of each section is same.

Q.32 Rohit is making a wheel using spokes. He wants to fix equal spokes in such a way that the angles between any pair of consecutive spokes are equal. Help him by completing the following table:

<table>
<thead>
<tr>
<th>No. of Spokes</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle between a pair of consecutive spokes</td>
<td>90°</td>
<td>60°</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

a) Are the number of spokes and the angles formed between the pair of consecutive spokes in inverse proportion?
b) Calculate the angle between a pair of consecutive spokes on a wheel with 15 spokes.
c) How many spokes would be needed if the angle between a pair of consecutive spokes is 40°?

Q.33 a) Factorise then divide:
\[
\frac{156 \cdot (36y^2 - 64y)}{104 \cdot (6y + 8) 
\]
b) Factorise: \( 16a^2 - 25b^2 + 60bc - 36c^2 \)

Q.34 Draw a line graph for the following:

<table>
<thead>
<tr>
<th>Side of square (in cm)</th>
<th>10</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perimeter (in cm)</td>
<td>40</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>160</td>
</tr>
</tbody>
</table>

Q.35 a) A milk tank is in the form of a cylinder whose radius is 1.5 m and length is 7m. Find the quantity of milk in litres that can be stored in the tank.
b) Find the height of a cuboid whose volume is 275cm³ and base area is 25 cm²