MATHEMATICS, Paper - II
(Oriya and English versions)
(Parts A and B)

Time : 2 hrs. 45 min.] [Maximum Marks : 40

Instructions :
1. Read all questions. 15 minutes of time is allotted exclusively for reading the Question Paper and 2.30 hours for writing the answers.
2. Part - A answers should be written in separate answer book.
3. There are three sections in Part-A.
4. Answer all questions.
5. Every answer should be written visibly and clearly.
6. There is internal choice in section - III.

Part - A

Time : 2 hours Marks : 30

SECTION - I (Marks : 4×1=4)

(i) त्रिकोण ABC में भुजा AC की कितनी लंबाई है?
(ii) त्रिकोण ABC का क्षेत्रफल 1.

1. \( \triangle ABC \parallel LM \parallel BC \angle \alpha = 5 \)°, \( \frac{AL}{LB} = \frac{2}{3} \), \( AM = 5 \) cm; \( AC \) की कितनी लंबाई है?

2. \( \cos 15\)° . \( \sin 15\)° . \( \sec 75\)°.

16'O'(A) [1]
3. যদি দৃষ্টি দর্শক ৩টি মাত্র ও ৪টি মাত্র দিক চাই। যদি দলের দিকে ঠিক নিয়েন্ত্রণ করলে দিক দৃষ্টিগত সমান্তরাল হয়োক হবে?

4. যদি চারাগাভি পাদদেশিক দূরত্ব $x = a + \frac{\sum f_i d_i}{\sum f_i}$ এর জিনিস ছাড়াই, 'f' ও 'd' যদি নিয়ে দূরত্ব প্রদান করলে হবে বুদ্ধি পাবে মানুষের দৃষ্টিকোণ স্পষ্ট?

**SECTION - II**

(Marks : 5×2 = 10)

5. নীরব পুরুষ (x, 1) যেখানে (-1, 5) একটি সূত্রা থাকলে '5' এর মাধ্যমে 'x' ডান সূত্রা নিক্ষেপ করে।

6. 5 cm দীর্ঘ ঘোড়া ব্যাপার খসাল ছিল 13 cm দৃশ্যমান বল বিচার করলে বস্তুটি পরিমাণ কর।

7. \( \cos A = \frac{7}{25} \) হলে \( \sin A \) \& \( \cosec A \) নিক্ষেপ কর। অ্যাঙ্কের পরিকল্পন করো?

8. যদি ধরণের মেটার 24 m. ধরণের বল বিচার করলে ধরণের দৃশ্যমান হবে ।

9. নীরব পুরুষ সাধারণ প্লাস-পূরুষ পূর্ণিমা কর।

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>চিত্রিতি</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>13</td>
<td>20</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>

16'O'(A) [2]
SECTION - III

(Marks : 4x4 = 16)

(i) ଦୃଷ୍ଟି ପ୍ରସ୍ତୁତ କରିଲେଥିଲେ।

(ii) ସୁଭି ସୁଭି ଗ୍ରାହିତ ହାରି。

(iii) ସୁଭି ସୁଭି ଗ୍ରାହିତ 4।

10. (a) ସୁଭି ସୁଭି (sin A + cosec A)² + (cos A + sec A)² = 7 + tan²A + cot²A.

(b) ABC ରେ ବାଧନ ପାଇବା ହିତିତ; C ନକରି ବାଧନ ପାଇବ। BC = a, CA = b, AB = c ରେ ବାଧନ ପାଇବ। p ରେ ବାଧନ ପାଇବ।

(ii) \( \frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2} \).

11. (a) କୋରି ନେଟକର ବାଧନ ପାଇବା ହିତିତ।

<table>
<thead>
<tr>
<th>ହଟାମାକ୍ଷିକ କାର୍ଯ୍ୟର ଜାଗରଣ</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>ବିଷୟକୃତି</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>12</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

(b) A(−6, 10) ରେ ଏବଂ B(3, −8) ପାଇବ। ହିତିତ ପାଇବ। ହିତିତ-ଦୁଇ (-4, 6) ପାଇବ ସମେତ ତୁକୁକୋତିତ ପାଇବ ହା?

12. (a) ହିତିତ ପାଇବାକୁ ଦୁଇରେ ପାଇବା ହିତିତ ହିତିତ। ହିତିତ ହିତିତ ପାଇବାକୁ ଦୁଇରେ ପାଇବା ହିତିତ 

(i) 10, (b) 12 ରକ୍ଷିତ ଏହା ହାରି। (c) ହିତିତ ହିତିତ ପାଇବା, (d) '3' ର ସମେତ ପାଇବା ପାଇବା ହା?

(b) ସମେତ ପାଇବା ହାରି ଦୁଇରେ ସମେତ ପାଇବା ହାରି ଦୁଇରେ ପାଇବା ହାରି ଦୁଇରେ ପାଇବା ହାରି ଦୁଇରେ। ହିତିତ ପାଇବାକୁ ଦୁଇରେ 30° ସମେତ ହିତିତ ପାଇବ। ହିତିତ ପାଇବାକୁ ଦୁଇରେ 30° ସମେତ ହିତିତ ପାଇବ। ହିତିତ ପାଇବାକୁ ଦୁଇରେ ପାଇବ।

6'O'(A) [3]
13. (a) ମେ ରେବେକ QR କୁଣା ଏବଂ ମାଧରମି QR = 5.5 cm, ∠Q = 65° ରେ
PQ = 6 cm ଏବଂ ଏବଂ ରାଖି ଏହା ରେବେକ QR କୁଣା ପର୍ଯ୍ୟନ୍ତୁ ପରାମେଠୟ ଆଟ୍ରକ୍ଷ APQR ଏ
ମାଧରମି ପରାମେଲରିକ କେ 2/3 ଅଲୋ।

(b) 4 cm ରେବେକ QR କୁଣା ଏବଂ QR = 6 cm ଏବଂ QR କୁଣା ପରାମେଲରିକ ଏକ
ରେବେକ QR ସହିତ ତୁକଟି ତୁକଟି ବଳିବ କୁଣା ଏବଂ।
MATHEMATICS, Paper - II
(English version)
(Parts A and B)

Time : 2 hrs. 45 min.] [Maximum Marks : 40

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1. Read all questions. 15 minutes of time is allotted exclusively for reading the Question Paper and 2.30 hours for writing the answers.
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3. There are three sections in Part-A.
4. Answer all questions.
5. Every answer should be written visibly and clearly.
6. There is internal choice in section - III.

Part - A

Time : 2 hours
Marks : 30

SECTION - I
(Marks : 4×1=4)

Note : (i) Answer all the questions.
(ii) Each question carries 1 mark.

1. In ΔABC, LM // BC and \( \frac{AL}{LB} = \frac{2}{3} \), AM = 5 cm, find AC.

2. Evaluate \( \sin 15° \cdot \sec 75° \).

16. (A) [5] B
3. A box contains 3 blue and 4 red balls. What is the probability that the ball taken out randomly will be red?

4. The mean for a grouped data is calculated by 
   \[ \bar{x} = a + \frac{\sum f_i d_i}{\sum f_i} \]
   What do the terms 'f_i' and 'd_i' represent in the above formula?

SECTION - II

(Marks : 5x2 = 10)

Note: (i) Answer all questions.
      (ii) Each question carries 2 marks.

5. If the distance between two points (x, 1) and (-1, 5) is 5, find the value of 'x'.

6. Find the length of the tangent from a point 13 cm away from the centre of the circle of radius 5 cm.

7. If \( \cos A = \frac{7}{25} \), then find \( \sin A \) and \( \cosec A \).
   What do you observe?

8. Rehman observed the top of a temple at an angle of elevation of 30°, when the observation point is 24 m. away from the foot of the temple. Find the height of the temple.

9. Write mid-values of the following frequency distribution.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>13</td>
<td>20</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>
Note:  
(i) Answer all the questions.  
(ii) Choose any one from each question.  
(iii) Each question carries 4 marks.

10. (a) Prove that \((\sin A + \csc A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A)\).  

OR

(b) ABC is a right angled triangle, right angled at C. Let \(BC = a\), \(CA = b\), \(AB = c\) and let \(p\) be the length of perpendicular from C on AB. 
Prove that \((i) \, pc = ab \) and \((ii) \, \frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}\).

11. (a) Find the median of the following data.

<table>
<thead>
<tr>
<th>Class interval</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>12</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

OR

(b) In what ratio, does the point \((-4, 6)\) divide the line segment joining the points \(A(-6, 10)\) and \(B(3, -8)\) ?

12. (a) Two dice are thrown at the same time. What is the probability that the sum of two numbers appearing on the top of the dice is \((a)\) 10, \((b)\) less than or equal to 12, \((c)\) a prime number, \((d)\) multiple of ‘3’ ?

OR

(b) A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making 30° angle with the ground. The distance between the foot of the tree and the top of the tree on the ground is 6 m. Find the height of the tree before falling down.
13. (a) Construct a triangle PQR, where QR = 5.5 cm, \( \angle Q = 65^\circ \) and PQ = 6 cm. Then draw another triangle, whose sides are \( \frac{2}{3} \) times of the corresponding sides of \( \triangle PQR \).

**OR**

(b) Draw a circle of radius 4 cm and draw a pair of tangents to the circle, which are intersecting each other 6 cm away from the centre.
16'O'(B)

MATHEMATICS, Paper - II
(Oriya and English versions)
(Parts A and B)

Time : 2 hrs. 45 min.] [Maximum Marks : 40

Instruction : Write the answers to the questions in this Part-B on the Question paper itself and attach it to the answer book of Part-A.

Part - B

Time : 30 minutes

Marks : 10

SECTION - IV

(Marks : $20 \times \frac{1}{2} = 10$)

Note :

(i) Answer all the questions.
(ii) Each question carries $\frac{1}{2}$ mark.
(iii) Marks will not be awarded in any case of over-written, rewritten or erased answers.
(iv) Each question has four options. Write the CAPITAL LETTERS (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

14. \( \angle BDE = \ldots \)  

\[ \begin{array}{ccc}
\text{A} & \text{D} & \text{B} \\
\text{C} & \text{E} & \text{D} \\
60^\circ & 75^\circ & \angle BDE \\
\end{array} \]

(A) 45°  
(B) 65°  
(C) 75°  
(D) 60°

16'O'(B) [1]
15. \( \cos 60^\circ + \sin 30^\circ \) ର ପୂର୍ବ ଛାଡ଼ାବାରେକ।

(A) \( \frac{\sqrt{3}}{2} \)  
(B) 1  
(C) \( \cos 90^\circ \)  
(D) B ଓ C  

16. ପୂର୍ବରେକ ରେଖା ନିଦୃଷ୍ଟ ଏବଂ ରେଖାରୁ ଏକ କୋନାପାରେକ X-କୋordinate ନିଶ୍ଚିତ କରାଇବ।

(A) କକ୍ଷା 
(B) ପାର୍ଶ୍ଵ 
(C) କେନ୍ଦ୍ର 
(D) କୂଲୀ 

17. ଶ୍ରେମ୍ମାଣ (\(-a, 0\)), (0, \(b\)) ଓ (\(a, 0\)) ରେକୁ କୌଣ୍ଠରେ ଏକ କୋନାପାରେକ।

(A) \((a, b)\)  
(B) \((a/3, 0)\)  
(C) \((0, b/3)\)  
(D) \((a/3, b/3)\)  

18. ଉଦ୍ୟମକ ପାକକୋନାପାରେ ଭୂପାରେ

(A) \( \Delta = \frac{1}{2}bh \)  
(B) \( \Delta = \sqrt{(s-a)(s-b)(s-c)} \)  
(C) \( \Delta = \sqrt{s(s-a)(s-b)(s-c)} \)  
(D) \( A \& C \)  

19. ତୁକ୍ତକାଳରେ ରଜୋଯାଗରେ ରଜୋଯାଗ ମତା ବୋରିଶାଓ ଏକ ଓଡିଛାକୁ ଆକ୍ଷେପତର 

(A) ତୁକ୍ତକାଳରେ ଆକ୍ଷେପତର 
(B) ଟାନ ଆକ୍ଷେପତର 
(C) ଲେଖନ ଆକ୍ଷେପତର 
(D) ଧରାକୁକୁ ଆକ୍ଷେପତର 

20. ତୁକ୍ତକାଳରେ ବ୏ଟାକୁକୁ ବୁପାକୁ କୌଣ୍ଠରେ ଆକ୍ଷେପତର 

(A) 1  
(B) 2  
(C) 3  
(D) ଚାର 

21. \( \sec A + \tan A = \frac{1}{5} \) ରେକୁ \( \sec A - \tan A = \) ଛାଡ଼ାବାରେ 

(A) 5  
(B) \( \frac{1}{5} \)  
(C) \( \frac{4}{5} \)  
(D) \( \frac{2}{5} \)  

16'0'(B)  
B [2]
22. Which of the following angles is not an acute angle? [ ]
   (A) 15°  (B) 30°  (C) 45°  (D) 60°

23. Which angle is equal to 180°? [ ]
   (A) 60°  (B) 90°  (C) 180°  (D) 270°

24. If the angles of a triangle are 30°, 60°, and 90°, what is the third angle? [ ]
   (A) 15°  (B) 45°  (C) 75°  (D) 105°

25. \( P(E) = 0.05 \) and \( P(\overline{E}) = \) [ ]
   (A) 0.5  (B) 0.95  (C) 9.5  (D) 0.095

26. Which of the following numbers is not a perfect square? [ ]
   (A) 5, 6, 9, 10, 6, 11, 4, 6, 10, 4 [ ]
   (B) 4  (C) 6  (D) 10

27. \( \tan \theta \) is equal to [ ]
   (A) \( \sec \theta \)  (B) \( \cot \theta \)  (C) \( \csc \theta \)  (D) \( -\tan \theta \)

28. \( (\sec^2 \theta - 1)(\csc^2 \theta - 1) = \) [ ]
   (A) 0  (B) 1  (C) \( \tan^2 \theta \)  (D) \( \cot^2 \theta \)

16°O'(B) B [3]
29. ତୁକ୍ତାର ବାଁକ୍ଷି (2, 1) ନାକୁ ସାଧାରଣ ଦେଶାନ୍ତି ନୂଆରେ (3, -4) ରକ୍ଷଣ େକ୍ଷଣ
ଉତ୍ତମ ନୂଆରେ ହେବାରେ କଥା?

(A) (1, 6)  (B) (-1, -6)
(C) (1, -6)  (D) (-1, 6)

30. \( \frac{x_i - a}{h} \)
ବୁରୁଲିପିତୁ ବଡାୟେ କେନ୍ଦ୍ର ବର୍ତ୍ତ୍ତାକୀ ଧନ୍କେ ଯେତିଙ୍କ

କାରକରୁ କୁଷତ ?

(A) \( d_i \)  (B) \( f_i \)
(C) \( u_i \)  (D) \( x \)

31. ସୁତ୍ର ଥର୍ତ୍ତ ଆବା ନେଳୁବେ ସୂତ୍ର କଥା?

(A) 12 ୟୁରୀ ବଳାବା  (B) 6 ୟୁରୀ ବଳାବା
(C) 24 ୟୁରୀ ବଳାବା  (D) 18 ୟୁରୀ ବଳାବା

32. ଦୁର୍ଗା ଦୁର୍ଗା କେନ୍ଦ୍ର ବେଳାକେ ସେଭାବା?

(A) -1.5  (B) 2.4
(C) 0.7  (D) 115%

33. \( \sin (90 - A) = \frac{1}{2} \)

ଜଳଦାକୁ \( A = \) କେନ୍ଦ୍ର ବଳାବା?

(A) 30°  (B) 45°
(C) 60°  (D) 90°

16'O'B

MARCH, 2019
MATHEMATICS, Paper - II
(English version)
(Parts A and B)

Time: 2 hrs. 45 min. [Maximum Marks: 40]

Instruction: Write the answers to the questions in this Part-B on the Question paper itself and attach it to the answer book of Part-A.

Part - B

Time: 30 minutes Marks: 10

SECTION - IV (Marks: $20 \times \frac{1}{2} = 10$)

Note:

(i) Answer all the questions.
(ii) Each question carries $\frac{1}{2}$ mark.
(iii) Marks will not be awarded in any case of over-written, rewritten or erased answers.
(iv) Each question has four options. Write the CAPITAL LETTERS (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

14. In the figure, $\angle BDE = \ldots$ [ ]

```
A
 /  \
 /    \
D----B
 /  \
 /   \
E----C
  60\  75\```

(A) 45°
(B) 65°
(C) 75°
(D) 60°

16 (B) [5]
15. \( \cos 60^\circ + \sin 30^\circ \) value is ....
   (A) \( \frac{\sqrt{3}}{2} \) \hspace{1cm} (B) 1
   (C) \( \cos 90^\circ \) \hspace{1cm} (D) B and C

16. X-coordinate of intersecting point of two ogives, represents ....
   (A) Mean \hspace{1cm} (B) Median
   (C) Range \hspace{1cm} (D) Mode

17. Centroid of a triangle, whose vertices are \((-a, 0), (0, b)\) and \((a, 0)\) is ...
   (A) \( (a, b) \) \hspace{1cm} (B) \( \left( \frac{a}{3}, 0 \right) \)
   (C) \( (0, \frac{b}{3}) \) \hspace{1cm} (D) \( \left( \frac{a}{3}, \frac{b}{3} \right) \)

18. The formula to find the area of a triangle is ....
   (A) \( \Delta = \frac{1}{2}bh \) \hspace{1cm} (B) \( \Delta = \sqrt{(s-a)(s-b)(s-c)} \)
   (C) \( \Delta = \sqrt{s(s-a)(s-b)(s-c)} \) \hspace{1cm} (D) A and C

19. The theorem applied to divide the line segment in the given ratio is ....
   (A) Pythagorus theorem \hspace{1cm} (B) Thales theorem
   (C) Euclid's theorem \hspace{1cm} (D) Brahmagupta theorem

20. The number of tangents drawn at the end points of the diameter is ....
   (A) 1 \hspace{1cm} (B) 2
   (C) 3 \hspace{1cm} (D) Infinite

21. If \( \sec A + \tan A = \frac{1}{5} \), then \( \sec A - \tan A = .... \)
   (A) 5 \hspace{1cm} (B) \( \frac{1}{5} \)
   (C) \( \frac{4}{5} \) \hspace{1cm} (D) \( \frac{2}{5} \)

16 (B) [6]
22. The length of shadow of a pole is equal to the length of the pole, then the angle of the elevation of the Sun is ....
   (A) 15°  (B) 30°
   (C) 45°  (D) 60°

23. Angle in a semi-circle is ...
   (A) 60°  (B) 90°
   (C) 180° (D) 270°

24. The probability that the sum of two numbers appearing on the top of the dice is 13, when two dice are rolled at the same time is ..... 
   (A) -1  (B) 1
   (C) 0    (D) 2

25. If \( P(E) = 0.05 \), then \( P(\overline{E}) = \) ....
   (A) 0.5  (B) 0.95
   (C) 9.5  (D) 0.095

26. The mode of the data 5, 6, 9, 10, 6, 11, 4, 6, 10, 4 is ....
   (A) 4    (B) 5
   (C) 6    (D) 10

27. Reciprocal of \( \tan \theta \) is ...
   (A) \sec \theta  (B) \cot \theta
   (C) \csc \theta (D) -\tan \theta

28. \( (\sec^2 \theta - 1)(\csc^2 \theta - 1) = \) ....
   (A) 0  (B) 1
   (C) \tan^2 \theta  (D) \cot^2 \theta

16. (B)  [7]
29. The centre of the circle is (2, 1) and one end of the diameter is (3, –4). Another end of the diameter is....
   (A) (1, 6)              (B) (–1, –6)
   (C) (1, –6)             (D) (–1, 6)

30. The letter that represents $\frac{x_i - a}{h}$, which is used in measuring mean is....
   (A) $d_i$               (B) $f_i$
   (C) $u_i$               (D) $\bar{x}$

31. In the given figure, area of $\triangle OAB$ is.......

![Diagram of triangle OAB with vertices O(0,0), A(3,0), B(0,4)]

   (A) 12 sq.u.           (B) 6 sq.u.
   (C) 24 sq.u.           (D) 18 sq.u.

32. Which of the following be the probability of an event?
   (A) – 1.5              (B) 2.4
   (C) 0.7               (D) 115%

33. $\sin(90 - A) = \frac{1}{2}$, then $A = ....$
   (A) 30°               (B) 45°
   (C) 60°               (D) 90°

B