

15'O'(A)

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

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

Instructions :

1. 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 neatly.
6. There is an internal choice in section - III of **Part-A**.

Part - A

Time : 2 hours

Marks : 30

SECTION - I

(Marks : 4×1=4)

- ଦ୍ରଷ୍ଟବ୍ୟ : (i) ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଲେଖ ।
(ii) ପ୍ରତି ପ୍ରଶ୍ନର ମୂଲ୍ୟାଙ୍କ 1 ।

1. $A = \{2, 4, 8, 16\}$ କୁ ସେରୀ ଗଠକ ରୂପରେ ଲେଖ ।
2. $\log_5 \sqrt{625}$ ର ମୂଲ୍ୟ ନିରୂପଣ କର ।

15'O'(A)
B

[1]

P.T.O.

3. ଦୁଇଟି ପରିପୂରକ କୋଣ ମଧ୍ୟରୁ ବଡ଼ଟି ସାନଠାରୁ 58° ଅଧିକ ହେଲେ କୋଣ ଗୁଡ଼ିକ ନିରୂପଣ କର ।

4. 7 cm. ବ୍ୟାସାର୍ଦ୍ଧ ଓ 10 cm. ଉଚ୍ଚତା ବିଶିଷ୍ଟ ସିଲିଣ୍ଡରର ବକ୍ରପୃଷ୍ଠର କ୍ଷେତ୍ରଫଳ ନିରୂପଣ କର ।

SECTION - II

(Marks : $5 \times 2 = 10$)

ପ୍ରଶ୍ନବ୍ୟ : (i) ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଲେଖ ।

(ii) ପ୍ରତି ପ୍ରଶ୍ନର ମୂଲ୍ୟାଙ୍କ 2 ।

5. ରୋହନ ମା' ତା'ଠାରୁ 26 ବର୍ଷ ବଡ଼ । ତିନି ବର୍ଷ ପରେ ସେମାନଙ୍କ ବୟସର ଗୁଣଫଳ 360 ହେବ । ରୋହନର ବର୍ତ୍ତମାନ ବୟସ ନିରୂପଣ ପାଇଁ ଆବଶ୍ୟକ ହେଉଥିବା ଦ୍ଵିଘାତ ସମୀକରଣଟି ଲେଖ ।

6. ଦ୍ଵିଘାତ ବହୁପଦୀ $x^2 - x - 30$ ର ଶୂନ୍ୟଗୁଡ଼ିକ ନିରୂପଣ କର ଏବଂ ଶୂନ୍ୟ ଓ ସହଗମାନଙ୍କ ସମ୍ବନ୍ଧର ସତ୍ୟାପନ କର ।

7. ତଳେ ଡୋକରର ଟୋପିର ଆକାର ଲମ୍ବଚୁକ୍ତାୟ ଶକ୍ତ ପରି । ଏହାର ଚୁ ବ୍ୟାସାର୍ଦ୍ଧ 7 cm ଓ ଉଚ୍ଚତା 24 cm ହେଲେ ଏକଜି 10ଟି ଟୋପି ତିଆରି ପାଇଁ ଆବଶ୍ୟକ ହେଉଥିବା ଆନିର କ୍ଷେତ୍ରଫଳ ନିରୂପଣ କର ।

8. ଉଭୟଦ୍ଵିଙ୍କ ବିଭାଜନ ପ୍ରମେୟିକା ବ୍ୟବହାର କରି 1260 ଓ 1440 ର HCF ନିରୂପଣ କର ।

9. ଏକ A.P. ର ପ୍ରଥମ 15 ପଦର ସମଷ୍ଟି 675 ଓ ପ୍ରଥମ ପଦ 10 ହେଲେ 25 ଡମ ପଦ ନିରୂପଣ କର ।

SECTION - III

(Marks : 4×4=16)

- ଦ୍ରଷ୍ଟବ୍ୟ : (i) ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଲେଖ ।
(ii) ପ୍ରତି ପ୍ରଶ୍ନର ମୂଲ୍ୟାଙ୍କ 4 ।

10. (a) ଦର୍ଶାଅ ଯେ $2+5\sqrt{3}$ ଅପରିମେୟ ।

ଅଥବା

(b) A.P. : 22, 15, 8, 1, ର ଗୋଟିଏ ପଦ - 321 କି ନୁହେଁ ଯାଞ୍ଚ କର ।

11. (a) ଏକ ଶ୍ରେଣୀ ପରାକ୍ଷାରେ ମୌଳିକାର ଗଣିତ ଓ ଇଂଲିଶ ମାର୍କର ସମଷ୍ଟି 30; ସେ ଯଦି ଗଣିତରେ ଅଧିକ 2 ମାର୍କ ଓ ଇଂଲିଶରେ କମ୍ 3 ମାର୍କ ପାଇଥାନ୍ତା ତେବେ ତା ମାର୍କ ମାନଙ୍କର ଗୁଣଫଳ 210 ହୋଇଥାନ୍ତା । ଦୁଇଟି ବିଷୟରେ ତାର ମାର୍କ ନିରୂପଣ କର ।

ଅଥବା

(b) ଗୋଟିଏ ତେଲ ପିମ୍ପାର ଆକୃତି ସିଲିଣ୍ଡର ଲକ୍ଷ୍ୟ । ଏହାର ବ୍ୟାସ 2 m. ଓ ଉଚ୍ଚତା 7 m.; ଚିତ୍ରକାର m^2 ପିଛା ରଙ୍ଗ ମାରିବାକୁ ₹ 5 ନିଏ । ଏଭଳି 10 ଟି ପିମ୍ପାରେ ରଙ୍ଗ ମାରିବାକୁ ଚିତ୍ରକାର ମୋଟ କେତେ ନେବ ନିରୂପଣ କର ।

12. (a) ଯଦି $A = \{x : x \text{ ଏକ ଗଣନ ସଂଖ୍ୟା ଯାହା 6 ରୁ କମ୍}\}$.

$B = \{x : x \text{ ଏକ ମୌଳିକ ସଂଖ୍ୟା ଯାହା 60 ର ଏକ ଉତ୍ତର}\}$.

$C = \{x : x \text{ ଏକ ଅଯୁଗ୍ମ ଗଣନ ସଂଖ୍ୟା ଯାହା 10ରୁ କମ୍}\}$.

$D = \{x : x \text{ ଏକ ଯୁଗ୍ମ ଗଣନ ସଂଖ୍ୟା ଯାହା 48ର ଏକ ଉତ୍ତର}\}$.

ତାହା ହେଲେ ଏ ସମସ୍ତ ସେଟ୍ ପାଇଁ ରୋଷର ରୂପ ଲେଖ ଏବଂ ନିରୂପଣ କର :

(i) $A \cup B$ (ii) $B \cap C$

(iii) $A - D$ (iv) $D - B$.

ଅଥବା

(b) 6ଟି ପେନ୍‌ସିଲ୍ ଓ 4ଟି ଖାତାର ମୋଟ ମୂଲ୍ୟ Rs. 90/-; 8ଟି ପେନ୍‌ସିଲ୍ ଓ 3ଟି ଖାତାର ମୋଟ ମୂଲ୍ୟ 85/- ହେଲେ ଗୋଟିଏ ପେନ୍‌ସିଲ୍ ଓ ଗୋଟିଏ ଖାତାର ମୂଲ୍ୟ ନିରୂପଣ କର ।

13. (a) ଗ୍ରାଫ୍ ବ୍ୟବହାର କରି ଦ୍ଵିଘାତ ବହୁପଦୀ $p(x) = x^2 + x - 20$ ର ଶୂନ୍ୟମାନ ନିରୂପଣ କର ।

ଅଥବା

(b) ନିମ୍ନ ଚୈତ୍ଵିକ ସମୀକରଣ ଯୋଡ଼ିକ୍ରମ ଗ୍ରାଫ୍ ବ୍ୟବହାର କରି ସମାଧାନ କର ।

$$2x + y = 4 \quad \& \quad 2x - 3y = 12.$$

ClassResult.in

15 (A)

MATHEMATICS, Paper - I

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

Instructions :

1. 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 neatly.
6. There is an internal choice in section - III of **Part-A**.

Part - A

Time : 2 hours

Marks : 30

SECTION - I

(Marks : $4 \times 1 = 4$)

- NOTE :** (i) Answer **all** the following questions.
(ii) Each question carries 1 mark.

1. Write $A = \{2, 4, 8, 16\}$ in set-builder form.
2. Find the value of $\log_5 \sqrt{625}$.

15 (A)
B

[5]

P.T.O.

3. The larger of two supplementary angles exceeds the smaller by 58° , then find the angles.
4. Find the curved surface area of cylinder, whose radius is 7 cm. and height is 10 cm.

SECTION - II

(Marks : $5 \times 2 = 10$)

NOTE : (i) Write answers to **all** questions.
(ii) Each question carries **2** marks.

5. Rohan's mother is 26 years older than him. The product of their ages after 3 years will be 360. Then write the required quadratic equation to find Rohan's present age.
6. Find the zeroes of the quadratic polynomial $x^2 - x - 30$ and verify the relation between the zeroes and its co-efficients.
7. A Joker's cap is in the form of right circular cone, whose base radius is 7 cm and height is 24 cm. Find the area of sheet required to make 10 such caps.
8. Find the HCF of 1260 and 1440 by using Euclid's division lemma.
9. If the sum of first 15 terms of an A.P is 675 and its first term is 10, then find 25th term.

- NOTE :** (i) Answer **all** the following questions.
(ii) Each question carries 4 marks.

10. (a) Show that $2 + 5\sqrt{3}$ is irrational.

OR

(b) Check whether -321 is a term of the A.P. : $22, 15, 8, 1, \dots$

11. (a) In a class test, the sum of Moulika's marks in Mathematics and English is 30. If she got 2 marks more in Mathematics and 3 marks less in English, the product of her marks would have been 210. Find her marks in the two subjects.

OR

(b) An oil drum is in the shape of cylinder, whose diameter is 2 m. and height is 7 m. The painter charges ₹ 5 per m^2 to paint the drum. Find the total charges to be paid to the painter for 10 drums.

12. (a) If $A = \{x : x \text{ is a natural number less than } 6\}$.
 $B = \{x : x \text{ is a prime number which is a divisor of } 60\}$.
 $C = \{x : x \text{ is an odd natural number less than } 10\}$.
 $D = \{x : x \text{ is an even natural number which is a divisor of } 48\}$.

Then write roster form for all above sets and find

- (i) $A \cup B$ (ii) $B \cap C$
(iii) $A - D$ (iv) $D - B$.

OR

(b) 6 pencils and 4 note books together cost Rs. 90/- whereas 8 pencils and 3 note books together cost Rs. 85/-. Find the cost of one pencil and that of one note book.

13. (a) Find the zeroes of the quadratic polynomial $p(x) = x^2 + x - 20$ using graph.

OR

- (b) Solve the following pair of linear equations graphically,
 $2x + y = 4$ and $2x - 3y = 12$.
-

ClassResult.in

This Question Paper contains 8 Printed Pages.

15'O'(B)

MATHEMATICS, Paper - I

(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

Instruction :

- (i) 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.
- (ii) Marks are **not** awarded for over-written answers.
- (iii) All questions carry equal marks.

SECTION -IV

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

ଦ୍ରଷ୍ଟବ୍ୟ : (i) ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଲେଖ ।

(ii) ପ୍ରତି ପ୍ରଶ୍ନର ମୂଲ୍ୟାଙ୍କ $\frac{1}{2}$ ।

14. $n(A) = 8$, $n(B) = 3$, $n(A \cap B) = 2$ ହେଲେ $n(A \cup B) = \dots$ []

(A) 5

(B) 7

(C) 9

(D) 13

15'O'(B)

[1]

P.T.O.

B

15. $6x^2 - 5x + 1 = 0$ ର ବିଭେଦକ []
- (A) 1 (B) 2
(C) 6 (D) $-\frac{5}{6}$
16. ବହୁପଦୀ $x^2 + 5x + 6$ ର ଶୂନ୍ୟ ଗୁଣିତର ସମଷ୍ଟି []
- (A) 5 (B) -5
(C) 6 (D) $\frac{5}{6}$
17. ନିମ୍ନ ମଧ୍ୟରୁ କେଉଁଟି ଅପରିମେୟ ନୁହେଁ? []
- (A) $\sqrt{2}$ (B) $\sqrt{3}$
(C) $\sqrt{4}$ (D) $\sqrt{5}$
18. ସମୀକରଣ $x - \frac{3}{x} = 2$ ର ଗୋଟିଏ ମୂଳ []
- (A) 1 (B) 2
(C) 3 (D) 4
19. 4, a, 9 ଯଦି G.P. ରେ ଅବସ୍ଥିତ ତେବେ $a = \dots\dots$ []
- (A) 6 (B) ± 6
(C) 7 (D) ± 7
20. ସମଘନର ସମଗ୍ର ପୃଷ୍ଠ କ୍ଷେତ୍ରଫଳ 96 cm^2 ହେଲେ ଏହାର ଆୟତନ []
- (A) 32 cm^3 (B) 64 cm^3
(C) 128 cm^3 (D) 256 cm^3
21. $\log_{10} 0.001 = \dots\dots$ []
- (A) 2 (B) 3
(C) -2 (D) -3

15'O'(B)

[2]

B

22. ଉତ୍ତର ଯୋଗ କର :

ଏକ ଘନ ବହୁପଦୀ $ax^3 + bx^2 + cx + d$, ($a \neq 0$) ର ଉନ୍ମୁଳଗୁଡ଼ିକ

α, β, γ ହେଲେ

[]

(i) $\alpha + \beta + \gamma$ (a) $-\frac{d}{a}$

(ii) $\alpha\beta + \beta\gamma + \gamma\alpha$ (b) $\frac{c}{a}$

(iii) $\alpha\beta\gamma$ (c) $-\frac{b}{a}$

- (A) (i) $\rightarrow c$, (ii) $\rightarrow b$, (iii) $\rightarrow a$ (B) (i) $\rightarrow a$, (ii) $\rightarrow b$, (iii) $\rightarrow c$
 (C) (i) $\rightarrow b$, (ii) $\rightarrow a$, (iii) $\rightarrow c$ (D) (i) $\rightarrow c$, (ii) $\rightarrow a$, (iii) $\rightarrow b$

23. A.P. $\sqrt{3}, \sqrt{12}, \sqrt{27}$ ର ପରବର୍ତ୍ତୀ ପଦ ...

[]

- (A) $\sqrt{32}$ (B) $\sqrt{36}$
 (C) $\sqrt{42}$ (D) $\sqrt{48}$

24. ବର ବିକ୍ରମରେ ଜାୟାକୃତ ଅକ୍ଷର ବର୍ଣ୍ଣାଏ

[]



- (A) $A - B$ (B) $B - A$
 (C) $\mu - B$ (D) $A \cup B$

25. $5x - 3$ ବହୁପଦୀର ପ୍ରତିନିଧିତ୍ୱ କରେ ।

[]

- (A) ରୈଖିକ (B) ଦ୍ୱିଘାତ
 (C) ଘନ (D) $A \cup B$

26. A.P. $\log_2 2, \log_2 4, \log_2 8$ ର ସାଧାରଣ ପାର୍ଥକ୍ୟ

[]

- (A) 1 (B) 2
 (C) 3 (D) 4

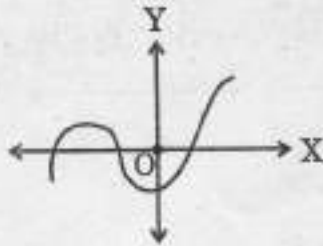
27. ପ୍ରଥମ 'n' ଅଯୁଗ୍ମ ଗଣନ ସଂଖ୍ୟାର ସମଷ୍ଟି []

- (A) n (B) n^2
(C) $n(n+1)$ (D) $\frac{n(n+1)}{2}$

28. $\sqrt{2}$ ଓ $-\sqrt{2}$ ଶୂନ୍ୟ ଥିବା ଦ୍ୱିଘାତ ବହୁପଦୀ []

- (A) $x^2 - 2$ (B) $x^2 + 2$
(C) $x^2 + \sqrt{2}$ (D) $x - 2$

29. ଗ୍ରାଫରେ ବହୁପଦୀର ଶୂନ୍ୟଗୁଡ଼ିକର ସଂଖ୍ୟା []



- (A) 0 (B) 1
(C) 2 (D) 3

30. $2x - 3y = 8$ ରେଖା X-ଅକ୍ଷକୁ ଠାରେ ଛେଦ କରେ । []

- (A) $(2, -3)$ (B) $(0, -3)$
(C) $(2, 0)$ (D) $(4, 0)$

31. 3 cm ବ୍ୟାସାର୍ଦ୍ଧ ଓ 8 cm ଉଚ୍ଚତା ବିଶିଷ୍ଟ ଶକ୍ତର ଆୟତନ cm^3 . []

- (A) 6π (B) 12π
(C) 18π (D) 24π

32. ଯଦି $6x + 2y - 9 = 0$ ଓ $kx + y - 7 = 0$ ର ସମାଧାନ ନାହିଁ ତେବେ $k = \dots$ []

- (A) 3 (B) 2
(C) -3 (D) -2

33. $x^2 + 5x + K = 0$ ର ଦାଋକ ଓ ଭିନ୍ନ ମୂଳମାନ ଥିଲେ ... []

- (A) $K = 6$ (B) $K < 6.25$
(C) $K > 6$ (D) $K > 25$

15 (B)

MATHEMATICS, Paper - I

(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

NOTE : (i) 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.

(ii) Marks are **not** awarded for over-written answers.

(iii) All questions carry equal marks.

SECTION-IV

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

NOTE : (i) Answer **all** the questions.

(ii) Each question carries $\frac{1}{2}$ mark.

14. If $n(A) = 8$, $n(B) = 3$, $n(A \cap B) = 2$, then $n(A \cup B) = \dots$ []

(A) 5

(B) 7

(C) 9

(D) 13

15 (B)

[5]

B

15. The discriminant of $6x^2 - 5x + 1 = 0$ is

[]

(A) 1

(B) 2

(C) 6

(D) $-\frac{5}{6}$

16. Sum of the zeroes of the polynomial $x^2 + 5x + 6$ is

[]

(A) 5

(B) -5

(C) 6

(D) $\frac{5}{6}$

17. Which of the following is not irrational?

[]

(A) $\sqrt{2}$

(B) $\sqrt{3}$

(C) $\sqrt{4}$

(D) $\sqrt{5}$

18. One root of the equation $x - \frac{3}{x} = 2$ is

[]

(A) 1

(B) 2

(C) 3

(D) 4

19. If 4, a , 9 are in G.P., then $a = \dots\dots$

[]

(A) 6

(B) ± 6

(C) 7

(D) ± 7

20. If total surface area of a cube is 96 cm^2 , then its volume is ...

[]

(A) 32 cm^3

(B) 64 cm^3

(C) 128 cm^3

(D) 256 cm^3

21. $\log_{10} 0.001 = \dots\dots$

[]

(A) 2

(B) 3

(C) -2

(D) -3

15 (B)

[6]

B

22. Match the following :

If α, β, γ are zeroes of a cubic polynomial

$$ax^3 + bx^2 + cx + d, (a \neq 0), \text{ then ...}$$

[]

(i) $\alpha + \beta + \gamma$

(a) $-\frac{d}{a}$

(ii) $\alpha\beta + \beta\gamma + \gamma\alpha$

(b) $\frac{c}{a}$

(iii) $\alpha\beta\gamma$

(c) $-\frac{b}{a}$

(A) (i) $\rightarrow c$, (ii) $\rightarrow b$, (iii) $\rightarrow a$

(B) (i) $\rightarrow a$, (ii) $\rightarrow b$, (iii) $\rightarrow c$

(C) (i) $\rightarrow b$, (ii) $\rightarrow a$, (iii) $\rightarrow c$

(D) (i) $\rightarrow c$, (ii) $\rightarrow a$, (iii) $\rightarrow b$

23. The next term in A.P. $\sqrt{3}, \sqrt{12}, \sqrt{27}$ is ...

[]

(A) $\sqrt{32}$

(B) $\sqrt{36}$

(C) $\sqrt{42}$

(D) $\sqrt{48}$

24. The shaded region in the given figure shows ...

[]



(A) $A - B$

(B) $B - A$

(C) $\mu - B$

(D) $A \cup B$

25. $5x - 3$ represents polynomial.

[]

(A) Linear

(B) Quadratic

(C) Cubic

(D) A and B

26. The common difference of A.P. $\log_2 2, \log_2 4, \log_2 8$ is

[]

(A) 1

(B) 2

(C) 3

(D) 4

27. The sum of first 'n' odd natural numbers is

[]

(A) n

(B) n^2

(C) $n(n+1)$

(D) $\frac{n(n+1)}{2}$

15 (B)

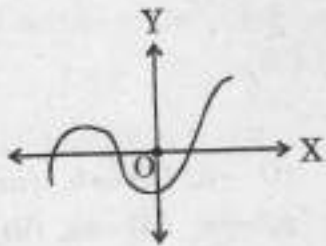
[7]

B

P.T.O.

28. The quadratic polynomial, whose zeroes are $\sqrt{2}$ and $-\sqrt{2}$ is []
- (A) $x^2 - 2$ (B) $x^2 + 2$
 (C) $x^2 + \sqrt{2}$ (D) $x - 2$

29. The number of zeroes of the polynomial in the graph is []



- (A) 0 (B) 1
 (C) 2 (D) 3
30. The line $2x - 3y = 8$ intersects X-axis at []
- (A) $(2, -3)$ (B) $(0, -3)$
 (C) $(2, 0)$ (D) $(4, 0)$

31. The volume of cone, whose radius is 3 cm and height is 8 cm, is ... cm^3 . []
- (A) 6π (B) 12π
 (C) 18π (D) 24π

32. If $6x + 2y - 9 = 0$ and $kx + y - 7 = 0$ has no solution, then $k = \dots$ []
- (A) 3 (B) 2
 (C) -3 (D) -2

33. If the equation $x^2 + 5x + K = 0$ has real and distinct roots, then ... []
- (A) $K = 6$ (B) $K < 6.25$
 (C) $K > 6$ (D) $K > 25$