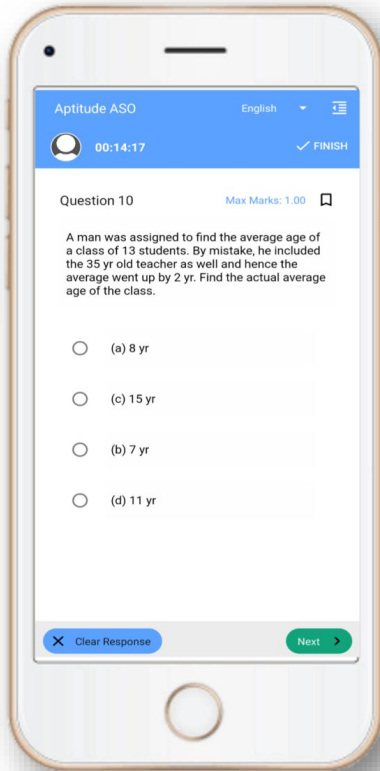


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No. of Questions : 50  
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2019

AH

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2341074

Roll No. : 235CD011

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Time : 1 Hour 15 Minutes

Full Marks : 50

SET :

B

ସମୟ : 1 ଘଣ୍ଟା 15 ମିନିଟ୍

ପୂର୍ଣ୍ଣ ସଂଖ୍ୟା : 50

REG. – 2019 / EX-REG. – 2014 COURSE

ଏହି ପ୍ରଶ୍ନପତ୍ର ପୁସ୍ତିକାଟି HSC ପରୀକ୍ଷାର୍ଥୀଙ୍କ ନିମନ୍ତେ ଉଦ୍ଦିଷ୍ଟ

ନିରୀକ୍ଷକଙ୍କ ନିମନ୍ତେ ସୂଚନା

SPECIAL INSTRUCTION TO THE INVIGILATORS

ଉକ୍ତ ବିଷୟର ପରୀକ୍ଷା ସରିବାପରେ ଏହି ପ୍ରଶ୍ନପତ୍ର ପୁସ୍ତିକା (PART - I - OBJECTIVE) ଟିକୁ ପରୀକ୍ଷାର୍ଥୀମାନେ ସାଥରେ ନେବେ । ପରୀକ୍ଷା ଗୃହ ଛାଡିବା ପୂର୍ବରୁ ନିରୀକ୍ଷକମାନେ ତାହାକୁ ଠିକ୍ ଭାବେ ତଦାରଖ କରିବା ଏକାନ୍ତ ଜରୁରୀ ।

The Candidates shall take away this Question Booklet (PART - I - OBJECTIVE) after the examination of this subject is over. It is important that the invigilators should verify the Booklet of the candidates before leaving the examination hall/room.

PART - I - OBJECTIVE (MCQ)  
OBJECTIVE QUESTION BOOKLET

AR/AXR – 15 – MTH

MTH – MATHEMATICS

B

SET

ପରୀକ୍ଷାର୍ଥୀଙ୍କ ନିମନ୍ତେ ସୂଚନା / INSTRUCTION TO CANDIDATES

ଏହି ପ୍ରଶ୍ନପତ୍ର ପୁସ୍ତିକାରେ 50ଟି ବହୁବିକଳ୍ପ ଉତ୍ତରମୂଳକ ପ୍ରଶ୍ନ ବିଆଯାଇଛି । ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନର ଉତ୍ତର OMR ଫର୍ମରେ ଥିବା ନିର୍ଦ୍ଦେଶାନୁସାରେ ଦେବା ଆବଶ୍ୟକ ।

This Question-Booklet contains 50 multiple choice questions. The candidates are required to answer the questions as per the instructions given in the OMR sheet.

ସମୟ : 1 ଘଣ୍ଟା 15 ମିନିଟ୍  
Time : 1 Hour 15 Minutes

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ପୂର୍ଣ୍ଣ ସଂଖ୍ୟା : 50  
Full Marks : 50

$\pi$  ର ମୂଲ୍ୟ  $\frac{22}{7}$  ନିଅ (Take  $\pi$  as  $\frac{22}{7}$ )

ଏହି ବିଭାଗରେ 50ଟି ପ୍ରଶ୍ନ ଦିଆଯାଇଛି। ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନ ପାଇଁ ଚାରୋଟି ବିକଳ୍ପ ଉତ୍ତର ଦିଆଯାଇଛି। ସେଥିମଧ୍ୟରୁ ଠିକ୍ ଉତ୍ତରଟି ବାଛି OMR ଉତ୍ତର ପତ୍ରରେ ଥିବା ସଂପୂର୍ଣ୍ଣ ବୃତ୍ତଟିକୁ ନୀଳ/କଳା ବଲ୍ ପଏଣ୍ଟ କଲମ ଦ୍ୱାରା ସମ୍ପୂର୍ଣ୍ଣ ଭାବେ ନୀଳ/କଳା କର ।

In this Part 50 Questions are given. Each question has four alternative answers. Choose the correct answer from them and darken the appropriate circle completely in the OMR sheet with the Blue/Black ball point pen.

ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନର ମୂଲ୍ୟ 1 (ଏକ) ଅଟେ।  
Each question carries 1 (one) mark.

ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ ।

Answer all questions.

1.  $p$  ର ମୂଲ୍ୟ କେତେ ହେଲେ, ସମୀକରଣ  $3x+4y-2p=0$  ର ଏକ ସମାଧାନ ହେବ  $(2, 2)$  ?  
(A) 3 (B) 5  
(C) 7 (D) 9

2.  $3x+y+1=0$  ଓ  $rx+sy+7=0$  ସମୀକରଣଦ୍ୱୟ ଅସଙ୍ଗତ ହେଲେ,  $r:s$  କେତେ ?  
(A) 3:1 (B) 1:3  
(C) 5:1 (D) 1:5

3. ଭେରମିନାଣ୍ଡ  $\begin{vmatrix} 5 & 4 \\ 3 & 4 \end{vmatrix}$  ର ମୂଲ୍ୟ କେତେ ?  
(A) 8 (B) 10  
(C) 12 (D) 14

1. For which value of  $p$ ,  $(2, 2)$  is a solution of the equation  $3x+4y-2p=0$  ?  
(A) 3 (B) 5  
(C) 7 (D) 9

2. If the equations  $3x+y+1=0$  and  $rx+sy+7=0$  are inconsistent, then what is  $r:s$  ?  
(A) 3:1 (B) 1:3  
(C) 5:1 (D) 1:5

3. What is the value of the determinant  $\begin{vmatrix} 5 & 4 \\ 3 & 4 \end{vmatrix}$  ?  
(A) 8 (B) 10  
(C) 12 (D) 14

4. ନିମ୍ନ କେଉଁ ବିନ୍ଦୁଟି  $3x - 2y + 4 = 0$  ସମୀକରଣର ଲେଖ ଉପରେ ଅବସ୍ଥିତ ନୁହେଁ ?

B

- (A) (2, 5)  
 (B) (1, 2)  
 (C) (4, 8)  
 (D) (-2, -1)

5.  $3x - y = 2$  ର ଲେଖ ସହ ନିମ୍ନ କେଉଁ ସମୀକରଣର ଲେଖ ସମାନ୍ତର ?

C

- (A)  $3x + y = -2$   
 (B)  $2x - 3y = 2$   
 (C)  $6x - 2y = 3$   
 (D)  $6x + 2y = -4$

6. ଗୋଟିଏ ସଂଖ୍ୟା ଓ ତାହାର ବ୍ୟୁତ୍କ୍ରମର ସମଷ୍ଟି 3 । ସଂଖ୍ୟାଟି  $x$  ହେଲେ, ନିମ୍ନ ମଧ୍ୟରୁ କେଉଁଟି  $x$  ସମ୍ବଳିତ ଦ୍ଵିଘାତ ସମୀକରଣ ?

D

- (A)  $x^2 - 3x + 2 = 0$   
 (B)  $x^2 + 3x + 1 = 0$   
 (C)  $x^2 - 3x + 1 = 0$   
 (D)  $x^2 + 3x + 2 = 0$

7.  $p$  ର ମାନ ନିମ୍ନୋକ୍ତ ମଧ୍ୟରୁ କେଉଁଟି ନେଲେ,  $x^2 + px + 1 = 0$  ସମୀକରଣର ମୂଳଦ୍ଵୟ ବାସ୍ତବ ଓ ସମାନ ହେବେ ?

A

- (A) 2 (B) 2.5  
 (C) 4 (D) 8

4. Which of the following points does not lie on the graph of the equation  $3x - 2y + 4 = 0$  ?

- (A) (2, 5)  
 (B) (1, 2)  
 (C) (4, 8)  
 (D) (-2, -1)

5. The graph of which of the following equations is parallel to the graph of  $3x - y = 2$  ?

- (A)  $3x + y = -2$   
 (B)  $2x - 3y = 2$   
 (C)  $6x - 2y = 3$   
 (D)  $6x + 2y = -4$

6. The sum of a number and its reciprocal is 3. If the number is  $x$ , then which of the following is the quadratic equation containing  $x$  ?

- (A)  $x^2 - 3x + 2 = 0$   
 (B)  $x^2 + 3x + 1 = 0$   
 (C)  $x^2 - 3x + 1 = 0$   
 (D)  $x^2 + 3x + 2 = 0$

7. Which of the following being taken for  $p$ , the roots of the equation  $x^2 + px + 1 = 0$  will be real and equal ?

- (A) 2 (B) 2.5  
 (C) 4 (D) 8

8.  $x^2+x+k=0$  ଦ୍ଵିଘାତ ସମୀକରଣର ଏକ ମୂଳ  $-2$  ହେଲେ,  $k$  ର ମାନ କେତେ ?

B

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

9. ନିମ୍ନ କେଉଁ ଦ୍ଵିଘାତ ସମୀକରଣର ମୂଳଦ୍ଵୟର ସମଷ୍ଟି 2 ଏବଂ ମୂଳଦ୍ଵୟର ଗୁଣଫଳ  $-3$  ?

A

- (A)  $x^2-2x-3=0$   
(B)  $x^2+3x-3=0$   
(C)  $x^2-3x-3=0$   
(D)  $x^2+2x-3=0$

10. ଗୋଟିଏ AP ରେ,  $t_3$  ଠାରୁ  $t_8$  ଅଧିକ ହେଲେ, ଉକ୍ତ AP ର ସାଧାରଣ ଅନ୍ତର କେତେ ?

A

- (A) 5 (B) 4  
(C) 2 (D) 1

11. ଯେଉଁ AP ର  $t_n=5n+1$ , ତା'ର ସାଧାରଣ ଅନ୍ତର କେତେ ?

B

- (A) 7 (B) 5  
(C) 3 (D) 1

12. ନିମ୍ନ ଅନୁକ୍ରମମାନଙ୍କ ମଧ୍ୟରୁ କେଉଁଟି ସମାନ୍ତର ପ୍ରଗତି ନୁହେଁ ?

D

- (A) 1, 3, 5, 7, 9, .....  
(B) 0,  $-2$ ,  $-4$ ,  $-6$ , .....  
(C)  $-7$ ,  $-5$ ,  $-3$ ,  $-1$ , 1, 3, .....  
(D)  $-6$ ,  $-4$ ,  $-2$ , 2, 3, 4, .....

8. If one of the roots of the quadratic equation  $x^2+x+k=0$  is  $-2$ , then what is the value of  $k$  ?

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

9. Which of the following quadratic equations has the sum of the roots as 2 and product of the roots as  $-3$  ?

- (A)  $x^2-2x-3=0$   
(B)  $x^2+3x-3=0$   
(C)  $x^2-3x-3=0$   
(D)  $x^2+2x-3=0$

10. In an AP,  $t_8$  is more than  $t_3$  by 25. What is the common difference of the AP ?

- (A) 5 (B) 4  
(C) 2 (D) 1

11. What is the common difference of an AP of which  $t_n=5n+1$  ?

- (A) 7 (B) 5  
(C) 3 (D) 1

12. Which of the following sequences is not an AP ?

- (A) 1, 3, 5, 7, 9, .....  
(B) 0,  $-2$ ,  $-4$ ,  $-6$ , .....  
(C)  $-7$ ,  $-5$ ,  $-3$ ,  $-1$ , 1, 3, .....  
(D)  $-6$ ,  $-4$ ,  $-2$ , 2, 3, 4, .....

13. ଏକ AP ର  $S_n = n^2$ ,  $t_n =$  କେତେ ?

- B (A)  $2n$  (B)  $2n-1$   
(C)  $2n+1$  (D)  $2n+3$

14. କୌଣସି ତଥ୍ୟାବଳୀର ଲବ୍ଧାଙ୍କଗୁଡ଼ିକ ସାନରୁ ବଡ଼ ବା ବଡ଼ରୁ ସାନ କ୍ରମରେ ସଜ୍ଜିତ ଥିଲେ, ସେମାନଙ୍କ ମଝି ଲବ୍ଧାଙ୍କକୁ କ'ଣ କୁହାଯାଏ ?

- D (A) ବିଚ୍ୟୁତି  
(B) ଗରିଷ୍ଠକ  
(C) ମାଧ୍ୟମାନ  
(D) ମଧ୍ୟମା

15.  $x_1, x_2, x_3, \dots, x_n$  ଲବ୍ଧାଙ୍କଗୁଡ଼ିକର ମାଧ୍ୟମାନ  $M$  ହେଲେ,  $ax_1, ax_2, ax_3, \dots, ax_n$  (ଯେତେବେଳେ  $a \neq 0$ ) ଲବ୍ଧାଙ୍କମାନଙ୍କର ମାଧ୍ୟମାନ କେତେ ?

- C (A)  $M$  (B)  $M+a$   
(C)  $aM$  (D)  $M-a$

16. ପ୍ରଥମ 20 ଟି ଧନାତ୍ମକ ଯୁଗ୍ମ ସଂଖ୍ୟାର ମାଧ୍ୟମାନ କେତେ ?

- (A) 20 (B) 21  
(C) 22 (D) 24

13. In an AP,  $S_n = n^2$ , what is  $t_n$  ?

- (A)  $2n$  (B)  $2n-1$   
(C)  $2n+1$  (D)  $2n+3$

14. What is the middle of the scores in a data arranged in ascending or descending order known as ?

- (A) Deviation  
(B) Mode  
(C) Mean  
(D) Median

15. If  $M$  is the mean of the scores  $x_1, x_2, x_3, \dots, x_n$ , then what is the mean of the scores  $ax_1, ax_2, ax_3, \dots, ax_n$  (When  $a \neq 0$ ) ?

- (A)  $M$  (B)  $M+a$   
(C)  $aM$  (D)  $M-a$

16. What is the mean of the first 20 positive even numbers ?

- (A) 20 (B) 21  
(C) 22 (D) 24

17. ନିମ୍ନରେ ଦତ୍ତ ତଥ୍ୟାବଳୀର ମଧ୍ୟମା କେତେ ?

A 7, 12, 15, 6, 20

(A) 12

(B) 10

(C) 7

(D) 8

18. ଗୋଟିଏ ଲୁଡୁଗୋଟିକୁ ଥରେ ଗଢ଼ାଇଲେ ଫଳ 5 ବା ତା' ଠାରୁ କମ୍ ହେବାର ସମ୍ଭାବ୍ୟତା କେତେ ?

B

(A)  $\frac{3}{6}$

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

(C)  $\frac{6}{6}$

(D)  $\frac{2}{3}$

19. ଦୁଇଟି ମୁଦ୍ରା ଥରେ ଟସ୍ କରାଗଲା । ଅତି କମ୍ରେ ଦୁଇଟି T ଆସିବାର ସମ୍ଭାବ୍ୟତା କେତେ ?

A

(A)  $\frac{1}{4}$

(B)  $\frac{2}{4}$

(C)  $\frac{3}{4}$

(D)  $\frac{4}{4}$

20. ଗୋଟିଏ ଦଳରେ ଥିବା 4 ଜଣ ଝିଅ ଓ 6 ଜଣ ପୁଅଙ୍କ ମଧ୍ୟରୁ ଯଦୃଚ୍ଛା ଗୋଟିଏ ପିଲା ବାଛିଲେ, ସେ ପିଲାଟି ଗୋଟିଏ ଝିଅ ହେବାର ସମ୍ଭାବ୍ୟତା କେତେ ?

C

(A)  $\frac{1}{4}$

(B)  $\frac{2}{3}$

(C)  $\frac{2}{5}$

(D)  $\frac{3}{4}$

17. What is the median of the data given below ?

7, 12, 15, 6, 20

(A) 12

(B) 10

(C) 7

(D) 8

18. If a ludo-dice is rolled once, then what is the probability of getting 5 or less than that ?

(A)  $\frac{3}{6}$

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

(C)  $\frac{6}{6}$

(D)  $\frac{2}{3}$

19. Two coins are tossed once. What is the probability of getting at least two T's ?

(A)  $\frac{1}{4}$

(B)  $\frac{2}{4}$

(C)  $\frac{3}{4}$

(D)  $\frac{4}{4}$

20. A child is chosen at random from a group containing of 4 girls and 6 boys. What is the probability of the child being a girl ?

(A)  $\frac{1}{4}$

(B)  $\frac{2}{3}$

(C)  $\frac{2}{5}$

(D)  $\frac{3}{4}$

ରାମ କବିରା ମିତ୍ର / SPACE FOR ROUGH WORK

21. ଗୋଟିଏ ବ୍ୟାଗରେ ସମାନ ଆକାରର 5ଟି ଲାଲ, 3ଟି ଧଳା ଓ 2ଟି ହଳଦିଆ ଗୋଲାପ ଫୁଲ ଅଛି । ଏଥିରୁ ଯଦୁହ୍ନା ଗୋଟିଏ ଲାଲ ଗୋଲାପ ଫୁଲ ବାଛିବାର ସମ୍ଭାବ୍ୟତା କେତେ ?

D

- (A)  $\frac{1}{3}$  (B)  $\frac{1}{5}$   
(C)  $\frac{3}{10}$  (D)  $\frac{1}{2}$

22. ଏକ ତ୍ରିଭୁଜର ଶୀର୍ଷବିନ୍ଦୁ ତ୍ରୟର ସ୍ଥାନାଙ୍କ  $(0, 0)$ ,  $(1, 0)$  ଓ  $(0, 1)$  ହେଲେ, ତ୍ରିଭୁଜର କ୍ଷେତ୍ରଫଳ କେତେ ବର୍ଗ ଏକକ ?

B

- (A) 1 (B)  $\frac{1}{2}$   
(C)  $\frac{1}{3}$  (D)  $\frac{1}{4}$

23. M ଓ N ବିନ୍ଦୁଦ୍ୱୟ ମଧ୍ୟରେ ଦୂରତା 5 ଏକକ । M ର କ୍ରମିତ ଯୋଡ଼ି  $(3, 1)$  ଓ N ବିନ୍ଦୁଟି  $y$ -ଅକ୍ଷ ଉପରେ ଅବସ୍ଥିତ ହେଲେ, N ର କ୍ରମିତ ଯୋଡ଼ି କେତେ ?

C

- (A)  $(4, 0)$  (B)  $(0, 4)$   
(C)  $(5, 0)$  (D)  $(0, 5)$

24. ଗୋଟିଏ ରେଖାଖଣ୍ଡର ମଧ୍ୟବିନ୍ଦୁ ହେଉଛି ମୂଳବିନ୍ଦୁ ଏବଂ ଏକ ପ୍ରାନ୍ତବିନ୍ଦୁ ହେଉଛି  $(2, 3)$  । ତେବେ ନିମ୍ନ କେଉଁଟି ଅନ୍ୟ ପ୍ରାନ୍ତ ବିନ୍ଦୁର କ୍ରମିତ ଯୋଡ଼ି ?

D

- (A)  $(\frac{1}{2}, \frac{3}{2})$  (B)  $(-2, 3)$   
(C)  $(2, -3)$  (D)  $(-2, -3)$

21. Rose flowers of equal size are contained in a bag and of those 5 are red, 3 are white and 2 are yellow. If one is taken out from the bag at random, what is the probability of getting a red rose ?

- (A)  $\frac{1}{3}$  (B)  $\frac{1}{5}$   
(C)  $\frac{3}{10}$  (D)  $\frac{1}{2}$

22. If the co-ordinates of three vertices of a triangle are  $(0, 0)$ ,  $(1, 0)$  and  $(0, 1)$ , then what is the area of the triangle in square unit ?

- (A) 1 (B)  $\frac{1}{2}$   
(C)  $\frac{1}{3}$  (D)  $\frac{1}{4}$

23. The distance between two points M and N is 5 units. If the ordered pair of M is  $(3, 1)$  and N lies in the  $y$ -axis, what is the ordered pair of N ?

- (A)  $(4, 0)$  (B)  $(0, 4)$   
(C)  $(5, 0)$  (D)  $(0, 5)$

24. The origin is the midpoint of a line segment and  $(2, 3)$  is one of its end point, then which of the following represents the ordered pair of the other end point ?

- (A)  $(\frac{1}{2}, \frac{3}{2})$  (B)  $(-2, 3)$   
(C)  $(2, -3)$  (D)  $(-2, -3)$



25. ଦୁଇଟି ବିନ୍ଦୁ A ଓ B ର ସ୍ଥାନାଙ୍କ ଯଥାକ୍ରମେ  $(a, b)$  ଓ  $(a, -b)$  । ସେମାନଙ୍କର ଦୂରତା କେତେ ?

B

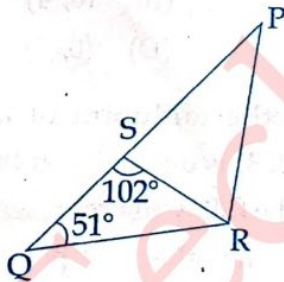
- (A)  $2a$
- (B)  $2b$
- (C)  $\sqrt{a^2+b^2}$
- (D)  $2\sqrt{a^2+b^2}$

26. ଦୁଇଟି ସମବାହୁ ତ୍ରିଭୁଜର କ୍ଷେତ୍ରଫଳର ଅନୁପାତ  $16 : 25$  ହେଲେ, ଉକ୍ତ ତ୍ରିଭୁଜ ଦ୍ୱୟର ଅନୁରୂପ ବାହୁଯୋଡ଼ାର ଦୈର୍ଘ୍ୟର ଅନୁପାତ କେତେ ହେବ ?

D

- (A)  $3 : 4$
- (B)  $6 : 5$
- (C)  $5 : 6$
- (D)  $4 : 5$

27. ନିମ୍ନ ଚିତ୍ରରେ,  $m\angle Q = 51^\circ$ ,  $m\angle QSR = 102^\circ$  ଓ  $\Delta SQR \sim \Delta RQP$  ହେଲେ,  $m\angle PRS$  କେତେ ହେବ ?



- (A)  $65^\circ$
- (B)  $70^\circ$
- (C)  $75^\circ$
- (D)  $80^\circ$

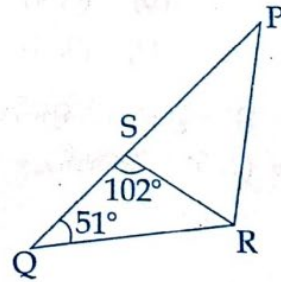
25. The co-ordinates of two points A and B are  $(a, b)$  and  $(a, -b)$  respectively. What is the distance between them ?

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

26. If the ratios of the areas of two equilateral triangles is  $16 : 25$ , then what is the ratio of the lengths of the corresponding sides of the same two triangles ?

- (A)  $3 : 4$
- (B)  $6 : 5$
- (C)  $5 : 6$
- (D)  $4 : 5$

27. In the given figure,  $m\angle Q = 51^\circ$ ,  $m\angle QSR = 102^\circ$  and  $\Delta SQR \sim \Delta RQP$ . What is  $m\angle PRS$  ?



- (A)  $65^\circ$
- (B)  $70^\circ$
- (C)  $75^\circ$
- (D)  $80^\circ$

ଉପର ଭାଗରେ ଥିବା ସ୍ଥାନ / SPACE FOR ROUGH WORK

28.  $\triangle ABC$  ଓ  $\triangle DEF$  ମଧ୍ୟରେ  $m\angle A = m\angle D$ ,  
 $m\angle B = m\angle E$ ,  $AB = 2$  ସେ.ମି.,  $BC = 3$  ସେ.ମି.,  
 ଓ  $DE = 6$  ସେ.ମି. ହେଲେ,  $EF$  କେତେ ସେ.ମି.  
 ହେବ ?

- (A) 9 (B) 7  
 (C) 5 (D) 3

29.  $\triangle DEF$  ରେ  $DE = 3$  ସେ.ମି.  $EF = 4$  ସେ.ମି. ଓ  
 $\triangle PQR$  ରେ  $PQ = 9$  ସେ.ମି. ।  $\triangle DEF$  ଓ  $\triangle PQR$   
 ସଦୃଶ ହେଲେ,  $QR$  କେତେ ସେ.ମି. ହେବ ?

- (A) 13 (B) 14  
 (C) 12 (D) 16

30.  $\triangle PQR$  ରେ  $\angle PQR$  ର ସମଦ୍ୱିଖଣ୍ଡକ  $\overline{PR}$  କୁ  $S$   
 ବିନ୍ଦୁରେ ଛେଦ କରେ ।  $PQ = 5$  ସେ.ମି. ଓ  
 $QR = 7$  ସେ.ମି. ହେଲେ,  $PS : PR$  କେତେ ହେବ ?

- (A) 5 : 12 (B) 12 : 5  
 (C) 8 : 12 (D) 12 : 8

31. ଗୋଟିଏ ବୃତ୍ତର ଦୁଇଟି ଜ୍ୟା  $\overline{PQ}$  ଓ  $\overline{RS}$  ପରସ୍ପରକୁ  $T$   
 ବିନ୍ଦୁରେ ଛେଦ କରନ୍ତି ।  $RT = 4$  ସେ.ମି.,  
 $ST = 3$  ସେ.ମି.,  $QT = 6$  ସେ.ମି. ହେଲେ,  $PT$  କେତେ  
 ସେ.ମି. ?

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

28. In  $\triangle ABC$  and  $\triangle DEF$  if  $m\angle A = m\angle D$ ,  
 $m\angle B = m\angle E$ ,  $AB = 2$  cm,  $BC = 3$  cm and  
 $DE = 6$  cm, then what is  $EF$  in cm ?

- (A) 9 (B) 7  
 (C) 5 (D) 3

29. In  $\triangle DEF$ ,  $DE = 3$  cm,  $EF = 4$  cm and in  
 $\triangle PQR$ ,  $PQ = 9$  cm. If triangles  $\triangle DEF$  and  
 $\triangle PQR$  are similar, then what is  $QR$   
 in cm ?

- (A) 13 (B) 14  
 (C) 12 (D) 16

30. In  $\triangle PQR$ , the bisector of  $\angle PQR$  intersects  
 $\overline{PR}$  at the point  $S$ . If  $PQ = 5$  cm and  
 $QR = 7$  cm, then what is  $PS : PR$  ?

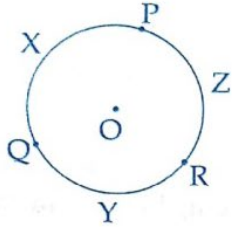
- (A) 5 : 12 (B) 12 : 5  
 (C) 8 : 12 (D) 12 : 8

31. Two chords  $\overline{PQ}$  and  $\overline{RS}$  of a circle  
 intersect each other at  $T$ . If  $RT = 4$  cm,  
 $ST = 3$  cm,  $QT = 6$  cm, what is  $PT$  in cm ?

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

32. ଦିଆଯାଇଥିବା ଚିତ୍ରରେ PQR ବୃତ୍ତର କେନ୍ଦ୍ର 'O' ।  
 $m\widehat{QRP} = 230^\circ$  ହେଲେ,  $m\angle PXQ$  କେତେ ?

B



- (A)  $140^\circ$       (B)  $115^\circ$   
 (C)  $105^\circ$       (D)  $100^\circ$

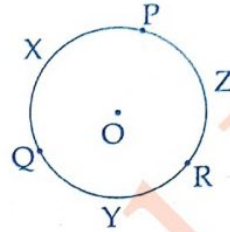
33. DEF ବୃତ୍ତରେ DE ଏକ ବ୍ୟାସ ।  $m\widehat{DFE}$  କେତେ ?

- (A)  $180^\circ$       (B)  $135^\circ$   
 (C)  $120^\circ$       (D)  $115^\circ$

34. କୋଣମାପ ଲାଗି ବ୍ୟବହୃତ ଡିଗ୍ରୀ ଏକକ ଓ ରେଡ଼ିଆନ୍ ଏକକ ମଧ୍ୟରେ ସମ୍ପର୍କ କ'ଣ ?

- (A)  $\frac{\pi}{3}$  ରେଡ଼ିଆନ୍ =  $40^\circ$   
 (B)  $\frac{2\pi}{3}$  ରେଡ଼ିଆନ୍ =  $100^\circ$   
 (C)  $\frac{\pi}{2}$  ରେଡ଼ିଆନ୍ =  $90^\circ$   
 (D)  $\pi$  ରେଡ଼ିଆନ୍ =  $120^\circ$

32. In the given diagram, 'O' is the centre of the circle PQR. If  $m\widehat{QRP} = 230^\circ$ , how much is  $m\angle PXQ$  ?



- (A)  $140^\circ$       (B)  $115^\circ$   
 (C)  $105^\circ$       (D)  $100^\circ$

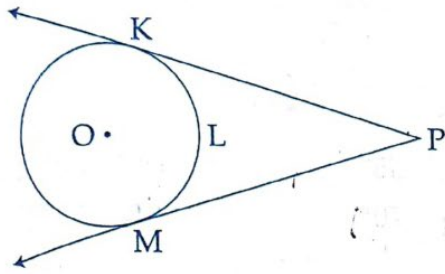
33. DE is a diameter in the circle DEF. How much is  $m\widehat{DFE}$  ?

- (A)  $180^\circ$       (B)  $135^\circ$   
 (C)  $120^\circ$       (D)  $115^\circ$

34. What is the relation between the degree unit and radian unit used for measuring an angle ?

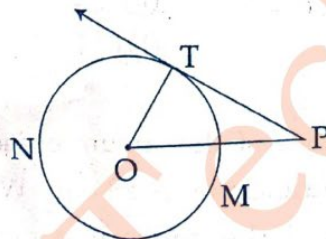
- (A)  $\frac{\pi}{3}$  radian =  $40^\circ$   
 (B)  $\frac{2\pi}{3}$  radian =  $100^\circ$   
 (C)  $\frac{\pi}{2}$  radian =  $90^\circ$   
 (D)  $\pi$  radian =  $120^\circ$

35. ଦତ୍ତ ଚିତ୍ରରେ KLM ବୃତ୍ତର କେନ୍ଦ୍ର O ଏବଂ P ବିନ୍ଦୁରୁ ଉଭୟ ବୃତ୍ତ ପ୍ରତି ଅଙ୍କିତ ସ୍ପର୍ଶକଦ୍ୱୟର ସ୍ପର୍ଶବିନ୍ଦୁ K ଓ M । ଯଦି  $m\angle KPM = 70^\circ$  ହୁଏ, ତେବେ  $m\widehat{KLM}$  କେତେ ?



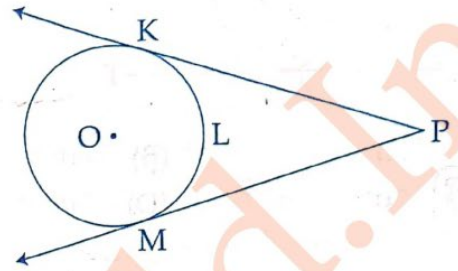
- (A)  $140^\circ$  (B)  $120^\circ$   
 (C)  $110^\circ$  (D)  $100^\circ$

36. ଦତ୍ତ ଚିତ୍ରରେ, NMT ବୃତ୍ତର କେନ୍ଦ୍ର 'O' ।  $\vec{PT}$  ଉଭୟ ବୃତ୍ତର T ବିନ୍ଦୁରେ ଏକ ସ୍ପର୍ଶକ ।  $PT = 40$  ସେ.ମି.,  $OP = 41$  ସେ.ମି. ହେଲେ,  $\overline{OT}$  ର ଦୈର୍ଘ୍ୟ କେତେ ସେ.ମି. ?



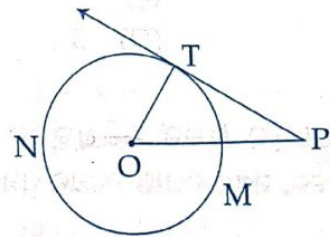
- (A) 9 (B) 12  
 (C) 13 (D) 24.5

35. In the given diagram, O is the centre of the circle KLM and K, M are the points of contacts of the tangents drawn to the circle from P. If  $m\angle KPM = 70^\circ$ , what is  $m\widehat{KLM}$  equal to ?



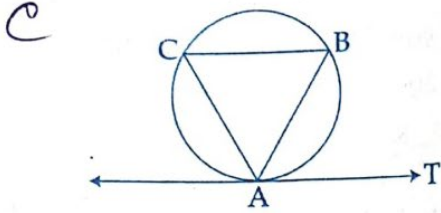
- (A)  $140^\circ$  (B)  $120^\circ$   
 (C)  $110^\circ$  (D)  $100^\circ$

36. In the given figure, 'O' is the centre of the circle NMT.  $\vec{PT}$  is a tangent to the circle at T. If  $PT = 40$  cm,  $OP = 41$  cm, then what is the length of  $\overline{OT}$  in cm ?



- (A) 9 (B) 12  
 (C) 13 (D) 24.5

37. ଦତ୍ତ ଚିତ୍ରରେ ABC ବୃତ୍ତ ପ୍ରତି A ବିନ୍ଦୁର  $\overleftrightarrow{TA}$  ସ୍ପର୍ଶକ  $m\angle CAB = 75^\circ$  ଏବଂ  $m\angle TAB = 35^\circ$  ହେଲେ,  $m\angle ABC$  କେତେ ?



- (A)  $55^\circ$  (B)  $60^\circ$   
 (C)  $70^\circ$  (D)  $50^\circ$

38. ଏକ ବୃତ୍ତର କେନ୍ଦ୍ର O, ବୃତ୍ତର ସମତଳରେ ଅବସ୍ଥିତ ବହିଃସ୍ଥ ଏକ ବିନ୍ଦୁ P ।  $\overline{PT}$  ଉକ୍ତ ବୃତ୍ତ ପ୍ରତି ଏକ ସ୍ପର୍ଶକଖଣ୍ଡ ହେଲେ,  $m\angle TOP + m\angle TPO$  ର ମାନ କେତେ ?

D

- (A)  $30^\circ$  (B)  $45^\circ$   
 (C)  $60^\circ$  (D)  $90^\circ$

39. ଦୁଇଟି ଅନ୍ତଃସ୍ପର୍ଶୀ ବୃତ୍ତର ସରଳ ସାଧାରଣ ସ୍ପର୍ଶକ ସଂଖ୍ୟା କେତେ ?

A

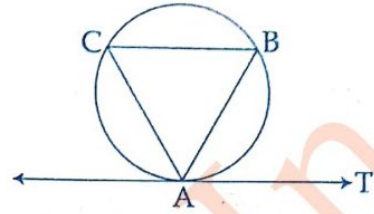
- (A) 4 (B) 2  
 (C) 1 (D) 3

40. ଦୁଇଟି ଏକ କେନ୍ଦ୍ରିକ ବୃତ୍ତର ପରିଧିଦ୍ୱୟର ଅନ୍ତର 88 ସେ.ମି. ହେଲେ, ସମ୍ପୃକ୍ତ ବୃତ୍ତାନ୍ତ ବଳୟର ପ୍ରସ୍ଥ କେତେ ସେ.ମି.?

B

- (A) 7 (B) 14  
 (C) 21 (D) 42

37. In the given figure  $\overleftrightarrow{TA}$  is a tangent to the circle ABC at A. If  $m\angle CAB = 75^\circ$  and  $m\angle TAB = 35^\circ$ , then what is  $m\angle ABC$  ?



- (A)  $55^\circ$  (B)  $60^\circ$   
 (C)  $70^\circ$  (D)  $50^\circ$

38. O is the centre of a circle and P is an exterior point in the plane of the circle. If  $\overline{PT}$  is a tangent segment to the circle, then how much is  $m\angle TOP + m\angle TPO$  ?

- (A)  $30^\circ$  (B)  $45^\circ$   
 (C)  $60^\circ$  (D)  $90^\circ$

39. What is the number of direct common tangents of two internally tangent circles ?

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

40. The difference of the circumferences of two concentric circles is 88 cm. What is the width of the concerned circular annulus ?

- (A) 7 (B) 14  
 (C) 21 (D) 42

41. ଗୋଟିଏ ବୃତ୍ତକଳାର କ୍ଷେତ୍ରଫଳ ସମ୍ପୂର୍ଣ୍ଣ ବୃତ୍ତର କ୍ଷେତ୍ରଫଳର  $\frac{11}{20}$  ହେଲେ, ସମ୍ପୂର୍ଣ୍ଣ ଚାପର ଡିଗ୍ରୀ ପରିମାପ କେତେ ?

- (A)  $60^\circ$  (B)  $120^\circ$   
(C)  $189^\circ$  (D)  $198^\circ$

42. ଗୋଟିଏ ତ୍ରିଭୁଜାକୃତ ଭୂମି ବିଶିଷ୍ଟ ଏକ ପ୍ରିଜମର ଆୟତନ  $84\sqrt{3}$  ଘନ ସେ.ମି. ଓ ଉଚ୍ଚତା 7 ସେ.ମି. । ଏହାର ଭୂମି ଏକ ସମବାହୁ ତ୍ରିଭୁଜ ହେଲେ, ଭୂମିର ପ୍ରତ୍ୟେକ ବାହୁର ଦୈର୍ଘ୍ୟ କେତେ ସେ.ମି. ?

- (A)  $7\sqrt{3}$  (B)  $6\sqrt{3}$   
(C)  $5\sqrt{3}$  (D)  $4\sqrt{3}$

43. ଗୋଟିଏ କୋନ୍ର ଭୂମିର ବ୍ୟାସାର୍ଦ୍ଧ 6 ସେ.ମି. ଓ ଉଚ୍ଚତା 7 ସେ.ମି. ହେଲେ, କୋନ୍ର ଆୟତନ କେତେ ବର୍ଗ ସେ.ମି. ?

- (A)  $\frac{240}{3}\pi$  (B)  $\frac{250}{3}\pi$   
(C)  $84\pi$  (D)  $87\pi$

44. ଗୋଟିଏ ସିଲିଣ୍ଡର ଆକୃତି ବିଶିଷ୍ଟ ଖୋଲାପାତ୍ରର ଭିତର ବ୍ୟାସାର୍ଦ୍ଧ  $2\frac{1}{3}$  ସେ.ମି. ଓ ଉଚ୍ଚତା 9 ସେ.ମି. । ତେବେ ଏଥିରେ ସର୍ବାଧିକ କେତେ ଘନ ସେ.ମି. ତରଳ ପଦାର୍ଥ ରହିପାରିବ ?

- (A) 142 (B) 145  
(C) 154 (D) 156

41. The area of a sector is  $\frac{11}{20}$  th of the area of the corresponding circle, what is the degree measure of the arc of the sector ?

- (A)  $60^\circ$  (B)  $120^\circ$   
(C)  $189^\circ$  (D)  $198^\circ$

42. The volume of a prism is  $84\sqrt{3}$  cubic cm and the height of the prism is 7 cm. If the base of the prism is an equilateral triangle, then what is the length, in cm, of each side of its base ?

- (A)  $7\sqrt{3}$  (B)  $6\sqrt{3}$   
(C)  $5\sqrt{3}$  (D)  $4\sqrt{3}$

43. What is the volume, in cubic cm, of a cone with 6 cm as radius of the base and 7 cm as height ?

- (A)  $\frac{240}{3}\pi$  (B)  $\frac{250}{3}\pi$   
(C)  $84\pi$  (D)  $87\pi$

44. The inner radius and height of an open cylindrical vessel are  $2\frac{1}{3}$  cm and 9 cm respectively. What is the greatest number of cubic cm of liquid it can hold ?

- (A) 142 (B) 145  
(C) 154 (D) 156

45.  $\cos(A+B) + \cos(A-B) = 6\cos A$  ?
- (A)  $2 \sin A \cdot \cos B$   
 (B)  $2 \cos A \cdot \sin B$   
 (C)  $2 \cos A \cdot \cos B$   
 (D)  $2 \sin A \cdot \sin B$

46.  $\cot 80^\circ \times \cot 70^\circ \times \cot 60^\circ \times \dots \times \cot 10^\circ$  ର ମାନ ନିମ୍ନଲିଖିତ କେଉଁଟି ସହ ସମାନ ?
- (A) 0 (B) 1  
 (C)  $\sqrt{2}$  (D)  $\sqrt{3}$

47.  $\Delta LMN$  ରେ  $\sin(L+M) = 1$  ହେଲେ,  $m\angle N$  କେତେ ?
- (A)  $60^\circ$  (B)  $90^\circ$   
 (C)  $120^\circ$  (D)  $135^\circ$

48. ଯଦି  $\cot \theta = \frac{p}{q}$  ହୁଏ, ତେବେ  $\operatorname{cosec}^2 \theta$  ର ମାନ କେତେ ?
- (A)  $\frac{p^2 - q^2}{q^2}$  (B)  $\frac{p^2 + q^2}{q^2}$   
 (C)  $\frac{q^2}{p^2 - q^2}$  (D)  $\frac{q^2}{p^2 + q^2}$

45. What is the value of  $\cos(A+B) + \cos(A-B)$  ?
- (A)  $2 \sin A \cdot \cos B$   
 (B)  $2 \cos A \cdot \sin B$   
 (C)  $2 \cos A \cdot \cos B$   
 (D)  $2 \sin A \cdot \sin B$

46. Which of the following is equal to  $\cot 80^\circ \times \cot 70^\circ \times \cot 60^\circ \times \dots \times \cot 10^\circ$  ?
- (A) 0 (B) 1  
 (C)  $\sqrt{2}$  (D)  $\sqrt{3}$

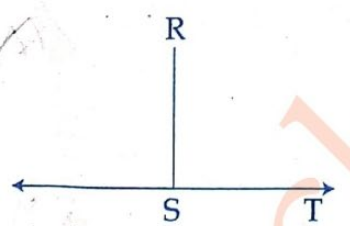
47. In  $\Delta LMN$ ,  $\sin(L+M) = 1$ . What is  $m\angle N$  equal to ?
- (A)  $60^\circ$  (B)  $90^\circ$   
 (C)  $120^\circ$  (D)  $135^\circ$

48. If  $\cot \theta = \frac{p}{q}$ , then what is the value of  $\operatorname{cosec}^2 \theta$  ?
- (A)  $\frac{p^2 - q^2}{q^2}$  (B)  $\frac{p^2 + q^2}{q^2}$   
 (C)  $\frac{q^2}{p^2 - q^2}$  (D)  $\frac{q^2}{p^2 + q^2}$

49.  $A + B + C = 90^\circ$  ହେଲେ,  $\cos(A + C)$  ର ମାନ କେତେ ?

- (A)  $-\cos B$  (B)  $\cos B$   
 (C)  $-\sin B$  (D)  $\sin B$

50. ଦିଆଯାଇଥିବା ଚିତ୍ରରେ  $\overline{RS} \perp \overleftrightarrow{ST}$  ।  $\overleftrightarrow{ST}$  ଭୂସମତଳକୁ ସୂଚାଏ ଏବଂ  $\overline{RS}$  ଏକ ସ୍ତମ୍ଭକୁ ସୂଚାଏ । S ବିନ୍ଦୁଠାରୁ T ବିନ୍ଦୁର ଦୂରତା K ମିଟର ଏବଂ R ବିନ୍ଦୁରେ ଥିବା ଜଣେ ବ୍ୟକ୍ତି T ବିନ୍ଦୁକୁ  $30^\circ$  କୋଣିକ ଅବନତିରେ ଦେଖିଲେ । ତେବେ  $\overline{RS}$  ସ୍ତମ୍ଭର ଉଚ୍ଚତା କେତେ ମିଟର ?

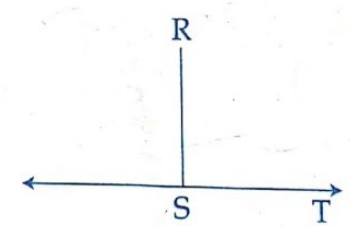


- (A)  $\sqrt{3} K$  (B)  $\frac{K}{\sqrt{3}}$   
 (C)  $\sqrt{2} K$  (D)  $\frac{K}{\sqrt{2}}$

49. If  $A + B + C = 90^\circ$ , then what is the value of  $\cos(A + C)$  ?

- (A)  $-\cos B$  (B)  $\cos B$   
 (C)  $-\sin B$  (D)  $\sin B$

50. In the given diagram  $\overline{RS} \perp \overleftrightarrow{ST}$ .  $\overleftrightarrow{ST}$  represents a horizontal plane and  $\overline{RS}$  represents a pole. If the distance of T from S is K metre and a man at R sees the point T at an angle of depression of  $30^\circ$ , then what is the length of the pole  $\overline{RS}$  in metre ?



- (A)  $\sqrt{3} K$  (B)  $\frac{K}{\sqrt{3}}$   
 (C)  $\sqrt{2} K$  (D)  $\frac{K}{\sqrt{2}}$

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