MT 1201

First Terminal Evaluation 2017-18

MATHEMATICS

Std. : X

Time : 2½ hours
Total Score : 80

Instructions :

1. Read each question and instructions carefully and write answer.
2. First 15 minutes is cool off time.
3. Give explanations if necessary.
4. Answer only required number of questions from each section.

Answer any four questions from 1 - 6.

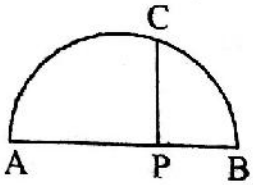
1. _____, 18, _____, 28 are four consecutive terms of an arithmetic sequence. Fill in the blanks. (2)

2. In triangle ABC, $\angle A = 30^0$, $\angle B = 60^0$. If we draw a circle with AB as diameter, say whether it will pass through C ? Why ? (2)

3. 45 is a term in the arithmetic sequence whose common difference is 2. Check whether the sum of any 17 terms of this sequence will be 2018 ? Why ? (2)

4. (a) How many two digit natural numbers are there in all ?
   (b) If we choose one number from the two digit numbers, what is the probability that the sum of digits of that number will be 10 ? (2)

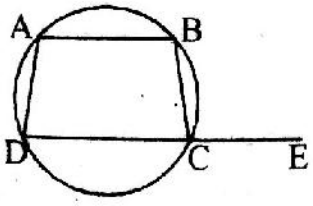
5. In the figure AB is the diameter. PC is perpendicular to AB. PC = 6 c.m, PB = 3 c.m. Find the radius of the semi circle.



(2)

6. If $\frac{3}{2}$, $\frac{5}{3}$, $\frac{11}{6}$ are the first three terms of an arithmetic sequence, find the first integer term in this sequence. (2)

Answer any four questions from 7 to 12.

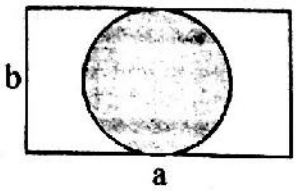
7. 

In the figure $\angle ADC = \angle BCD$.
Prove that $\angle ABC = \angle BCE$. (3)

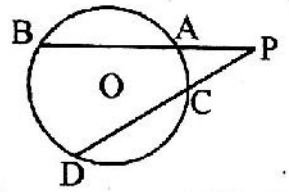
8. If the product of two consecutive odd numbers is 399, find the numbers. (3)

9. $5^1 \times 5^3 \times 5^5 \times \ldots\ldots\ldots 5^{2n-1} = (25)^{72}$ Find n. (3)

10. The algebraic expression of an arithmetic sequence is $3 - 5n$. Find.
    (a) Its common difference
    (b) First term
    (c) Form the sequence (3)

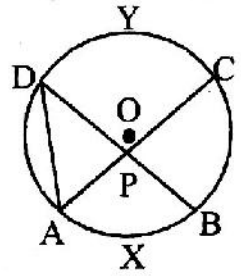
11. 

In the figure 'a' is the length and 'b' is the width of the rectangle. If we put a dot inside the rectangle without looking into it, what is the probability that it will be inside the shaded circle ? (3)

12. 

In the figure PA = 3 cm, AB = 9 cm, PC = 4 cm then find CD. (3)

Answer any 10 questions from 13 - 24.

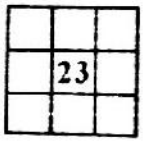
13 

In the figure O is the centre of the circle. Central angle of arc AXB is 60^0, arc CYD is 80^0. Then find all the angles of ΔAPD. (4)

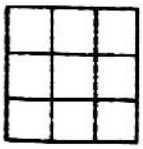
14. (a) Write the arithmetic sequence with first term 8 and common difference 3.
    (b) Check whether 100 is a term in this sequence.
    (c) Check whether the difference of any two terms of this sequence will be 2017.
    (d) Find the position of the term 125 in this sequence. (4)

15. A box contains beads of different colours. There are total 200 beads in it. One bead is taken at random. The probability that it is blue is 0.98 then
    (a) How many blue beads are there in the box ?
    (b) Some blue beads are removed from the box. Now probability of a blue bead becomes 0.96. So How many blue beads are removed ? (4)

16. (a) A square of 9 numbers in a calender is given below. The number in the middle column is 23. Fill the remaining columns.



(b) In another square of such 9 numbers, the product of first and last numbers is 36. Find the number in the middle column. (4)



17. (a) What is the sum of first 20 natural numbers ?

(b) Find the sum of first 20 terms of 4, 8, 12, ...

(c) If 3 is added to each term in the above sequence write down the algebraic expression of the new sequence.

(d) Find the sum of first 20 terms of the new sequence. (4)

18. Draw a line of length $\sqrt{12}$ c.m. Draw a square having area $12cm^2$. (4)

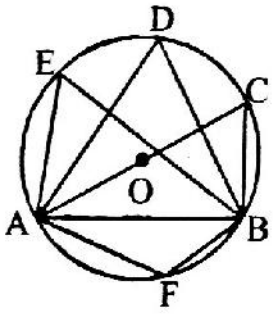
19. 23^{rd} term of an arithmetic sequence is 32. 35^{th} term is 104. Then

(a) What is the common difference ?

(b) Which is the middle term of first 35 terms of this sequence ?

(c) Find the sum of first 35 terms of this sequence. (4)

20. Age of Vineetha is twice her sisters age. After 4 years the product of their ages will be 160. Find the present ages of both. (4)

21. 

'O' is the centre of the circle $\angle D = 80^0$, find the following measurements.

(a) $\angle C$

(b) $\angle ABC$

(c) $\angle BAC$

(d) $\angle F$ (4)

22.

1

2 3 4

5 6 7 8 9

(a) How many numbers are there in the 30^{th} row of this number pyramid ?

(b) Which is the last number in the 30^{th} row ?

(c) Which is the first number in the 30^{th} row ?

(d) What is the sum of all terms in the first 30 rows ? (4)

23. Draw a rectangle with sides 5 cm and 3 cm. Draw another rectangle with same area and side 7 cm. (4)

24. A box contains paper slips numbered from 1 to 4. Another box contains slips numbered from 2 to 4. If one slip is taken from each box.

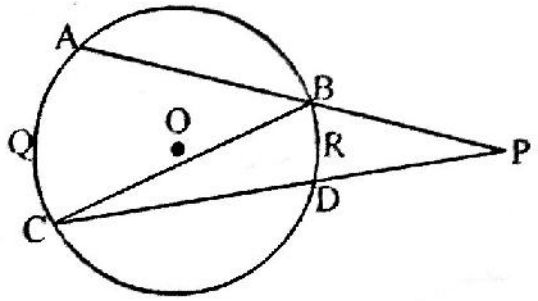
(a) Write all the possible pairs.

(b) What is the probability that the product of numbers in each slip is a multiple of 3 ?

(c) What is the probability that one number is square of the other ? (4)

Answer any four questions from 25 - 30.

25.



(a) Prove that angle P is half the difference between the central angles of arcs AQC and BRD.

(b) If the central angle of arc AQC is 110^0, arc BRD is 30^0 find all the angles of triangle PBC. (5)

26. n, 3n, 5n, ... is an arithmetic sequence.

(a) What is the common difference ?

(b) Prove that the sum of first n terms of this sequence is n^3.

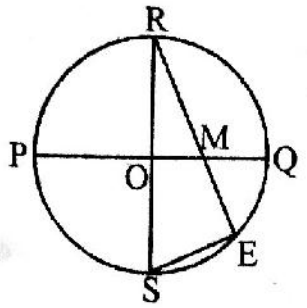
(c) Then find the sum of 15 terms of the sequence 15, 45, 75, ... (5)

27. There are 25 boys and 15 girls in class 10 A. 15 Boys and 20 girls in 10 B. One student has been selected at random.

(a) What is the probability that 'both are boys' ?

(b) What is the probability that 'both are girls' ?

(c) What is the probability that 'atleast one girl' is there ? (5)

28. 

In the figure O is the centre. PQ and RS are perpendicular diameters of the circle. Radius is 5 c.m. Chord RE cuts PQ at M. RE = 8 c.m. Then find the lengths of SE, RM, ME.

(5)

29. 23, 30, 37, ... is an arithmetic sequence.

(a) Write the algebraic form of the sequence.

(b) Write the algebraic form of the sum of n terms of the sequence.

(c) Prove that the square of any term of this sequence will not be a term in this sequence.

(d) Prove that there will be so many perfect squares in this sequence. (5)

30. Draw a triangle with sides 4, 5, 6 c.m.

Draw a rectangle having same area of this triangle.

Draw a square of same area.

(5)