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மாகாணக் கல்வித் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION – NORTH CENTRAL PROVINCE

Grade 10

THIRD TERM TEST - 2018

Mathematics I

School : .....

Name of the Student/ Index No : .....

.....

Time: 2 hrs.

Part A

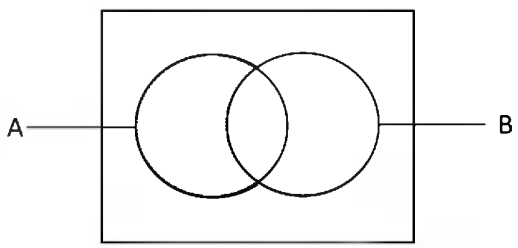
Answer all the questions on the paper itself.

1) If $\frac{2}{5}$ of a certain amount is Rs. 280/=, find the amount.

2) Find the value of $\sqrt{27}$ to the first approximation.

3) Simplify $\frac{1}{a} + \frac{2}{3a}$

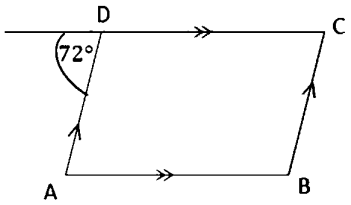
4) Express the shaded region using the set notation.



5) Factorize $x^2 + 3x - 18$

6) The n term of an arithmetic progression is $13 - 2n$. Find the 10^{th} term of that progression.

7)



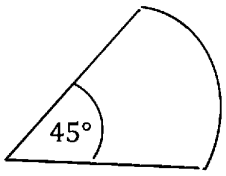
Find $A\hat{B}C$ **angle**

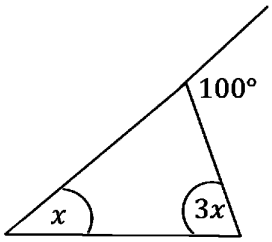
8) the sample space of a random experiment is $S = \{ 2" 4" 6" 8 \}$. If A is an event of getting a prime number, find P(A).

9) Write the equation of the straight line that is parallel to the straight line $y = 2x - 1$ and passes through the point (0,-2)

10) Find the L.C.M. of $15a^2x$ and $6x^2$.

11) Find the area length of the sector which is cut from a circle with 88cm circumference.



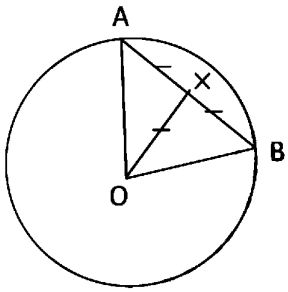


12) Find the value of x

13) If $log_4 64 = x$, find the value of x

14) Solve $\frac{x-1}{2} = 5$

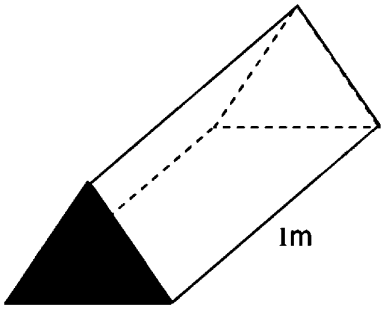
15) X is the midpoint of the chord AB of the circle of the centre"O". Find the magnitude of AOB.



16) Write two properties of a parallelogram.

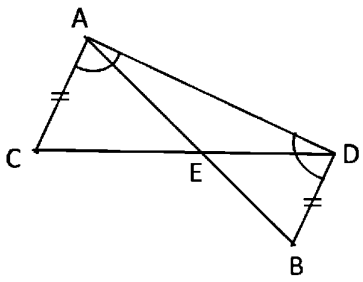
17

If the area of the cross section of the given right prism is $48cm^2$ and its length is 1m, find the volume of the prism.



18) The sum of the amounts of money of 4 students is Rs. 70/=. If another student added a certain amount of money to it, the mean of the amount of money is 18. Find the amount of money given by the 5^{th} student.

19)



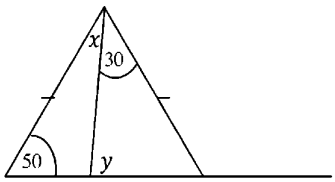
If AC=BD and $C\hat{A}D=A\hat{D}B$ in the figure,

i. Name a pair of congruent triangles.
ii. Write its congruency case.

20) If it is required to cover the whole surface area of the curved surface of a right cylindrical shaped tin of circumference of a circular face 44cm and the height 10cm with a label , find the minimum area of the label.

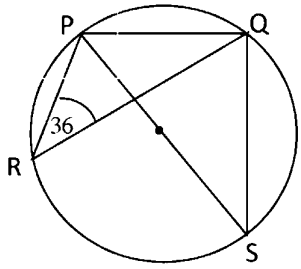
21) Find the distance that a motorbike which travels at a uniform speed of $56kmh^{-1}$ covers in15 seconds.

22)



Find the value of x and y with the given information.

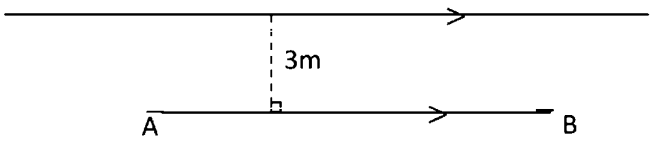
23)



PQis a chord of a circle of centre "O". If $P\hat{R}Q=36°$ find the magnitude of $Q\hat{P}S$.

24) Find the actual distance of 5cm of a map of scale 1:I 000 000 in Km.

25) AB is a straight road. A channel is constructed such that 3m away from the road to drain the water. Draw a sketch to select two places which are 5m away from point A on the channel using the knowledge of loci.



Part B

❖ **Answer all the qnestions in the paper itself.**

01) From a cultivated land, $\frac{3}{5}$ is used for a mango plantation. $\frac{1}{4}$ is used for a banana plantation. $\frac{2}{3}$ of the remaining land is used for an orange plantation. The rest is used for a pawpaw plantation.

i. What fraction of the total land is used for the mango and banana plantation? (03)

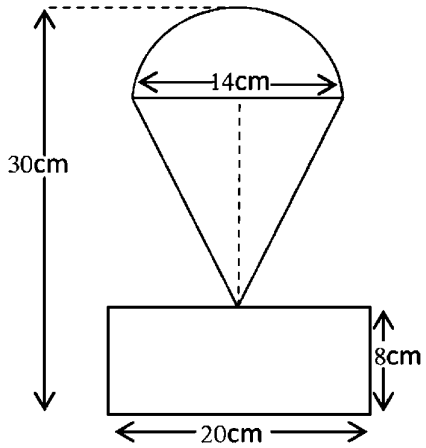
ii. What fraction of the total land remained after planting mangoes and bananas? (01)

iii. What fraction of the total land is used to plant oranges? (02)

iv. Indicate the portion of the land that is used to plant papaws as a fraction. (02)

V. If papaws are planted in 16 perches, find the amount of total land in perches. (02)

02) The figure shows a logo which was designed by using geometrical plane figures by a student. It consists of a rectangular part, a triangular part and a semi circular part. The total height of the logo is 30cm.



i. Find the area of the semi circular part. (02)

ii. Find the area of the triangular part. (02)

iii. Find the total area of the logo. (02)

iv. If a ribbon is to be fixed around the semi circular part, find the minimum length of the ribbon required.(02)

v. Find the area of the piece of cardboard that goes waste after cutting the above log from a cardboard of 30cm x 20cm. (02)

03) the following table provides information of 3 bucket subjccts that werc selected by 4 students out of 4 subjects.

snbject	No. of students	Tbe angle of tbe sector
Art	30	90°
Musie	20	.....
Literature	……	33

i. Complete the table. (02)
ii. Represent this information in a pie ehart. (04)

iii. If the remaining subjeet is Dancing, find the number of students studying Daneing. (02)

iv. Based on the above information, express the number of students studying Dancing as a percentage of total number of students.
(02)

04) a. If 3 paddy reaping machines are used to reap paddy in a certain paddy field, it takes only 8 hours. When the work is being done using the 3 maehines, after 2 hours one machine brakes down. If the other 2 machines are uscd to complete the task,

i. How many machine hours are required to complete the task? (01)

ii. After one maehine stooped working, how many maehine hours remained to be completed by the other 2 machines? (02)

iii. If 2 machines operators agree to do the remaining task by dividing the work into 2 equal parts, how mueh extra time is required to eomplete the task by one operator? (02)

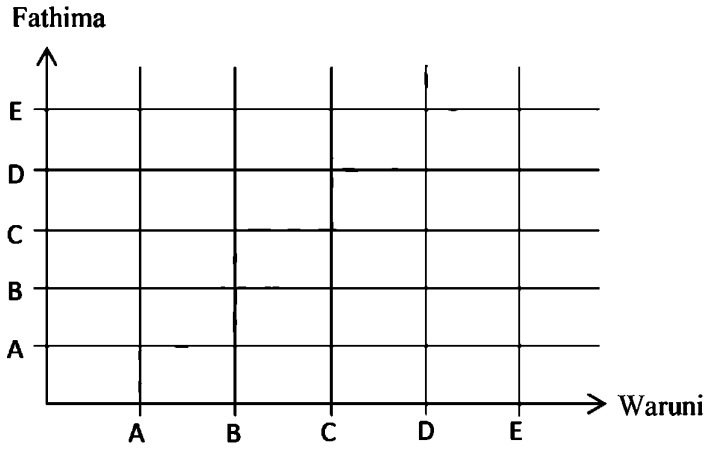
b. A certain provincial Council charges 6% as tax rate for a house. If the quarterly tax rate is Rs. 450/=,

i. What is the tax rate for a year? (01)

ii. Find the assessed annual value of the house. (02)

iii. If the Provincial Council informs that the tax rate for the next year is Rs. 2400/=, find the new tax rate percentage. (02)

05) A box contains five identical cards named as A, B, C, D and E. A card is taken randomly by Fathima. She observes the letter on the card and puts it back in the box. Again Waruni takes a card randomly. Show the sample space of the above experiment in the given grid (02)

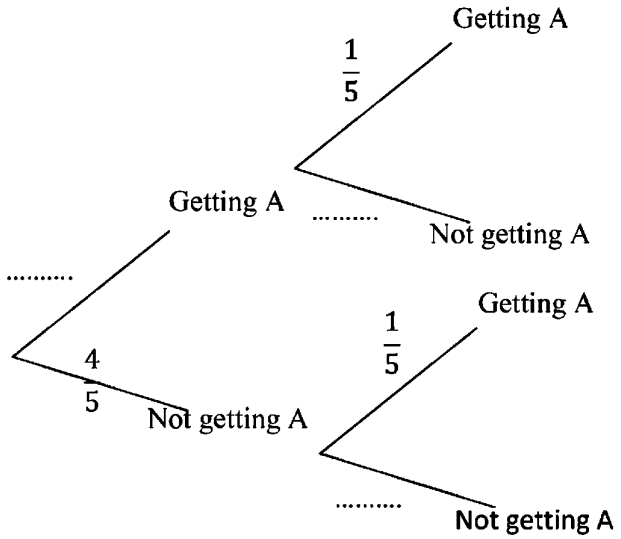


i. Insert in the grid the probability of getting same ball for both of them. (01)

ii. Find the probability of getting different letters by both of them. (02)

b) The incomplete tree diagram that shows the event getting letter A or not, if Fathima and Waruni hope to get letter A, is given below.

i. Complete the diagram. (03)



ii. Find the probability of fulfilling the hope of both of them. (02)

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மாகாணக் கல்வித் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION NORTH CENTRAL PROVINCE

Third Term Test -2018

Grade 10 **Mathematics**

Paper II

school:..... **Time : 3 hours**

Index Number:.....

- **Answer 10 qnestions hy selecting 5 qnestions from Part A and 5 qnestions from Part B.**
- **Each question carries 10 marks.**
- **The Volume of a right cylinder with a radius r and height h is$\pi r^2 h$.**

Part A

(01) When Anil imported a stock of 250 bicycles each worth Rs.7200/-, a custom duty of 60% had to be paid. Another Rs.120 000 /- had to be paid for transportation. If Anil sold this stock of bicycles for Rs. 375 000/- , find the profit percentage gained by him from the business. (10marks)

(02) An incomplete table prepared to draw the graph of the function $y = 3 - x^2$ is given below

x	-3	-2	-1	0	1	2	3
y	-6	-1	.....	3	2	-1	-6

i. Find the value of y when $x = -1$ (01)
ii. Using the scale of 10 small divisions as one unit along the x axis and along the y axis, draw the graph of the above function on a graph paper. (03)
iii. Write the range of the value of x for which the function is positive (02)
iv. Find the roots of the function $3 - x^2 = 0$ using the graph. (02)
v. Write the equation of the graphs which is obtained when the above graph is moved downward by 2 units. Write down the maximum value of it. (02)

(03) a.) Out of the parcels classified as A and B, the mass of a B type parcel is 10kg more than three times the mass of a A type parcel. The sum of masses of one A type parcel and 3 B type parcels is 34kg.

i. Taking the mass of a A type parcel as x, and the mass of a B type parcel as y , construct a pair of simultaneous equations. (02)

ii. Solve the pair of simultaneous equations and find the mass of an A type parcel and a B type parcel.(04)

(b.) A train engine can pull a maximum weight of 480t. it pulls 6 passenger compartments each weighing 60t and 3 goods wagons.

i. If the weight of a goods wagon is metric ton T, write an inequality including T? (02)

ii. By solving it, find the maximum weight of a goods wagon in metric tons. (02)

(04) a) In a right angled triangle the length of sides which include right angle are x *and* $(x+3)$ respectively. If the length of the hypotenuse of it is$(x+6)$,

i. Construct a relationship among the length of sides and by solving it, build up a quadratic equation. $x^2-6x-27=0$ (04)

ii. By solving it, find the length of sides of the triangle. (04)

b) Simplify $\frac{2x}{(x^2-6x-27)}-\frac{5}{(x+3)(x-9)}$ (02)

(05) The following table shows the data on the quantity of grains in kilograms that were brought to a certain grain collecting centre during 30 days.

Grains kg	101-109	110-118	119-127	128-136	137-145	146-154	155-163
No. of days	1	4	5	8	6	4	2

i. Find the modal class (01)

ii. What is the expected maximum quantity of grains in kilograms, that was brought in a day. (01)

iii. Find the mean quantity of grains in kilograms that were brought in a day using the mid-value of the modal class as the assumed mean or otherwise to the nearest whole number. (06)

iv. Based on the above means, find the expected quantity of grains in kilograms which will be brought during the next three months. (02)

06 A cylindrical shaped tank of radius 2m and the height 3.5m has been filled with water completely. How long will it take to empty the half of the tank using a pipe through which water removes at a uniform rate of 200l per a minute. (05)

Simplify using the logarithms table. $\frac{23.5\times145}{2.32}$ (05)

(07) A programme of offering lamps (pahan pooja) was held for Sanudhi's 15^{th} birthday. The lamps were arranged on the ground as a pattern. There were 5 lamps on the first circle, 8 lamps on the second circle, 11 lamps on the third circle and etc.

i. In which progression is the lamp pattern? Give reasons. (02)

ii. Find the number of lamps on the 10^{th} circle by using the formula. (02)

iii. If lamps were lighted up to 15 circles, find the total number of lamps used. (03)

iv. If 15ml of oil is needed for one lamp, is $6l$ of oil enough for this programme? Give reasons. (03)

08) Use only straight edge with a cm and mm scale and a pair of compasses for the following constructions. Show the construction lines clearly.

i. Construct the triangle ABC such that AB=8cm, $B\hat{A}C = 60°$, AC=7cm (03)

ii. Construct a parallel line to AB through C. (02)

iii. Mark the point D on the parallel line such CD=6cm and construct the trapezium ABDC. (01)

iv. Construct the perpendicular from C to AB and mark its foot as E. (02)

v. Measure the length CE and find the area of the trapezium ABDC. (02)

(09)An institution recruited some employers who passed both the written and the practical tests. 100 candidates participated in the tests. Only 80 candidates passed the written test and only 66 passed the practical test. 8 candidates failed both the tests.

i. Draw a Venn diagram to depict the above information. (03)

ii. Find the number of candidates who were qualified for the job. (02)

iii. Shade the region which represent the candidates who passed the written test but failed the practical test (01)

iv. When a person is randomly selected from the above group, find the probability of the event being a person who is not suitable for this job. (02)

v. If all the candidates who passed the written test have passed the practical test too, draw a Venn diagram to represent the above changes. Write all the elements in all regions. (02)

(10)

D is the midpoint of AC of the triangle ABC. The line drawn parallel to BC through A and BD, meet at E.

i. Indicate the information given above in a figure. (02)

ii. Prove that ABCE is a parallelogram. (04)

iii. If AC bisects $B\hat{A}E$, prove that AC ⊥ BE. (04)

11) An observer who stands 10m directly above the ground on a flat observes the bottom point B of a vertical building AB which is in the same horizontal ground with an angle of depression 35° and top of the building, point A with an angle of elevation of 25° .

i. Indicate the information given above in a sketch. (02)

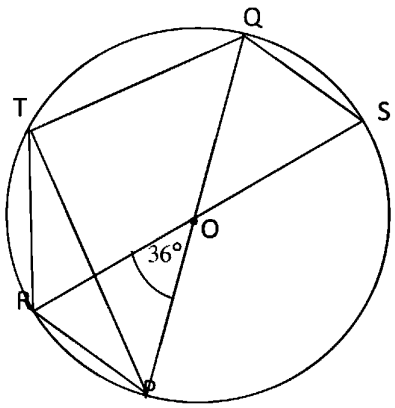
ii. Draw a scale diagram using the scale 1cm represents 2m. (03)

iii. Express the scale of it as a ratio. (01)

iv. According to the scale diagram, find the height of the building AB. (02)

v. Find the distance between the flat on which the observer is, and the building AB. (02)

(12)



PQ and RS are two diameters of a circle of center "O". T is a point on the circle. Fill in the blanks of the following.

i. $P\hat{T}R$ = …… (.....) (02)

ii. $P\hat{T}Q$ = …… (.....) (02)

iii. $R\hat{T}Q$ = …… +..... (01)

iv. $R\hat{T}Q$ = …… (01)

b) Prove that PR=QS of the above circle. (04)