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இரண்டாம் தவணைப் பரீட்சை 2018	தரம் 11
Second Term Test 2018	**Grade 11**

ගණිතය II	පැය 3.00
கணிதம் II	இரண்டு 3.00
Mathematics II	**3.00 hrs**

★ *Answer **ten** questions selecting **five** questions from Part A and **five** questions from part B.*

★ *Each question carries 10 marks.*

★ *The volume of cylinder of radius r and height h is $\pi r^2 h$ and the volume of a right circular cone of radius r and height h is $\frac{1}{3}\pi r^2 h$*

Part - A

(01) Mr.Jayanath who received a compensation as he lost his land due to the construction of a certain highway, deposited the compensation in a bank that paid an annual simple interest rate of 11% and received Rs. 132,000/- as interest at the end of two years. At the beginning of the third year, he withdrew the amount he had deposited and deposited that amount of money for 2 years in another commercial bank that paid an annual compound interest rate of 11%. Show that he gained a profit of Rs. 7260 by depositing the money in the second commercial bank.

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

x	-5	-4	-3	-2	-1	0	1
y	6	1	-2	….	-2	1	6

a) i)   Find the value of y when $x = -2$

   ii)   10 small divisions along both x and y axes as one unit, draw the graph of the above function.

b)   Using the graph,

   i)   Write down the equation of the axis of symmetry.

   ii)   Write down the minimum value of the function.

   iii)   Write down the interval of values of x when $y \leq -1$

   iv)   Find the value of $\sqrt{3}$

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03)
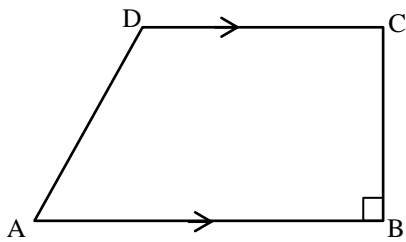
In trapezium *ABCD* shown in the figure, $AB = (x + 4)$ cm and $BC = x$ cm, $BC = CD$ and the area of the trapezium is 44cm². Build up an quadratic equation in terms of x and find the value of x to the first decimal place by solving the equation.

04) a) Solve : $\dfrac{2x}{(x+1)} = \dfrac{x}{2(x+1)} + \dfrac{1}{3}$

b) The price of two apples and an orange is Rs. 55. Four oranges can be bought with the money spent to buy three apples.

   i) Taking the price of an apple as Rs. x and the price of an orange as Rs. y, construct a pair of simultaneous equations including x and y.

   ii) Solve the above equations and find the price of an apple and an orange separately.

   iii) When the number of apples is a and the number of oranges is b, write down a pair of values for a and b that satisfy the equation $ax + by = 200$

05) Information on the distances that a rent car travelled during 50 days is shown in the table given below.

| Distance (km)	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of days	3	5	6	15	9	8	4

(the class interval 20-30 indicates the number of days greater than 20 and less than or equal to 30)

   i) What is the number of days that the rent car has travelled more than 50 km?

   ii) Taking the mid value of the modal class as the assumed mean, calculate, to the nearest kilometre, the mean distance the rent car has travelled in a day.

   iii) If the owner of the rent car charges Rs. 40 per kilometre and the total amount he has to spend for fuel and maintenance is Rs. 12 per kilometre, show that the mean income he gains for a day is more than Rs. 15000.

06) a)
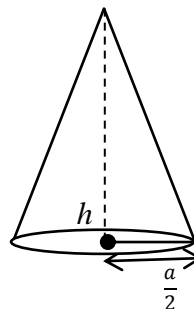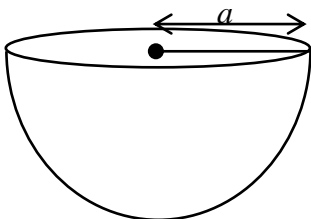
A right circular solid metal cone of height h and base radius $a/2$ has been made by melting a hemispherical metal object of radius a without any wastage of metal.
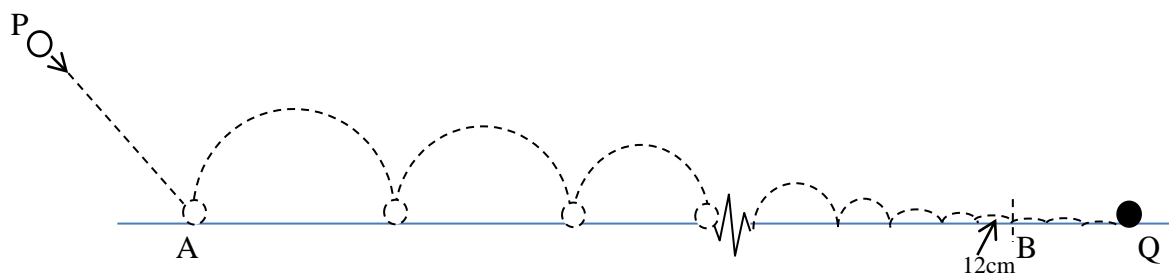
   i) Find the volume of the hemisphere metal object in terms of a

   ii) Show that the height of the metal cone is, $h = 8a$

b) Using logarithmic tables, simplify $\dfrac{\sqrt{12.47}}{3.45^2} \times 100.5$

07) a)

When a tennis ball is projected from the point *P* inclined to the vertical as shown in the figure, the ball moves in the first three consecutive bounces are 72cm, 69cm, 66cm respectively. The distance the ball moves from *B* to *Q* is 25 cm. The distance between the point *B* and the point it touches the ground prior to *B* is 12 cm. Using your knowledge about progressions, show, giving reasons, that the distance *AQ* is 9.07 m.

b) Find the sum of the first 11 terms of the geometric progression 3, -6, 12, -24 …..
(take $(-2)^{11} = -2048$)

08) Using a straight edge with mm/cm scale and a pair of compasses only,and showing the construction lines clearly,

i) Construct the triangle *ABC* such that $AB = 7cm$, $B\hat{A}C = 60^0$ and $AC = 5.5\ cm$

ii) Construct a straight line through *C* parallel to *AB*

iii) Construct a perpendicular to the parallel line constructed in (iii) above from B and name its foot as *D*.

iv) Construct the perpendicular bisector of *AB* and *BD* and name the point of intersection of the perpendicular bisectors as *P*

v) Taking the centre as *P*, construct the circle that passes through the points *A, B* and *D*. Suggest a suitable name for *AD* using the circle.

09)
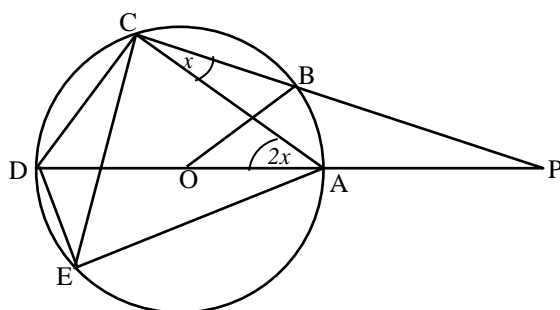
The points *A, B, C, D* and *E* lie on the circle with centre *O*. *AOD* is a diameter *CB* and *DA* produced to meet at *P*. If $A\hat{C}B = x$ and $D\hat{A}C = 2x$ write down the magnitude of each of the following angles in terms of *x*.

ii) $C\hat{E}D$

iii) $A\hat{D}C$

iv) $A\hat{O}B$

v) $A\hat{P}C$

10) The point *P* is located in the parallelogram *ABCD*. The mid point of *CP* is *X*. The straight line *BX* is produced to *Q* such that *BX = XQ. AQ* intersects *DP* at *Y*. Draw a figure and include the above data and show that *Y* is the mid point of *DP*.

11)
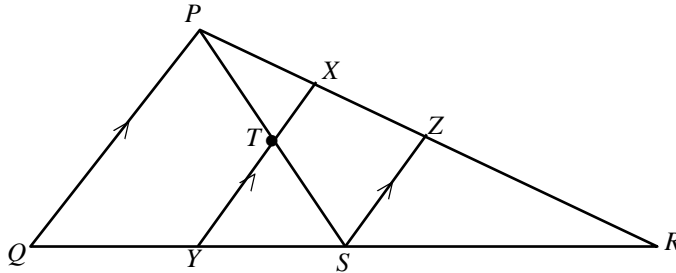
The midpoint of side QR of triangle PQR is S and the midpoint of PS is T. The straight line drawn through T parallel to PQ intersects PR and QR at X and Y respectively. The straight line drawn through S parallel to XY intersects PR at Z.

i)   Find the length of *TY* in terms of *PQ*

ii)   Find the length of *XT* in terms of *PQ*

iii) Find the length of *XY* in terms of *PQ*

iv) Show that $YS = \frac{1}{4} \ QR$

12) An unbiased cubical die numbered from 1 to 6 and an unbiased tetrahedron die numbered form 1 to 4 are thrown together, and the two numbers that turn up are observed.

i)   Show the sample space of this random experiment in a grid.

ii)   Enclose the event of obtaining the same number in both cubical die and tetrahedron die in the grid and name it as A. Find the probability of event A.

iii) Enclose the event of the sum of the two numbers obtained from the two dice being greater than 7 and name it as B. Find p(B)

iv) Write down P(A∪B) and P(A∩B) and verify P(A∪B) = P(A) + P(B) - (P(A∩B)

v)   If L and M are two mutually exclusive events of a certain sample space, find the value of P(L∩M)

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