Department of Education – Western Province

GCE (O/L) Examination – 2020
Practice Paper

Subject: Mathematics 11	Extra Time: 15 minutes	Time: 3 hours

Use the extra time to read the paper and select questions of your choice and to organize the priority order of answering the selected questions

Important:
- Answer ten questions selecting five questions from Part A and five questions from Part B
- Write down the appropriate steps and units in answering questions
- 10 marks each for all the questions
- The volume of a right circular cylinder with base radius r and the height h is $\pi r^2 h$
- The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$

Part A
Answer five questions only

1) a) Nuwan invested Rs 60 000 to buy shares each at Rs 20 in a company which pays annual dividends of Rs 8 per share. One year after he received his dividends he sold all the shares and earned a capital gain of Rs 15 000.

   i. How many shares did he have in the company?
   ii. What was his dividend income in the company end of the year?
   iii. End of the year what price did Nuwan sell each share at?

   b) After an year, Nuwan invested a certain amount of money in a financial institute which pays 10% simple interest per annum. If he earned Rs 10 000 as total interest after 2 years of investment, how much did Nuwan invest in the financial institute?

2)
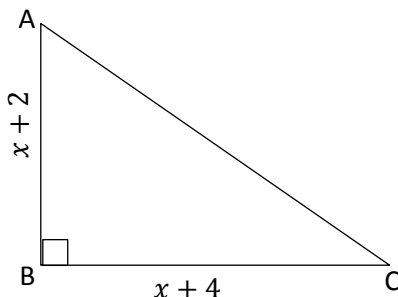
The area of the given right angled triangular laminar is 6cm². According to the given dimensions of the triangle,

a) Show that the value of x agrees with the equation, $x^2 + 6x - 4 = 0$.

b) Solve the equation for x either by completing the square or by any other method.
(use $\sqrt{13} = 3.61$)

3) An incomplete table of values of x and y is given below to draw the graph of the function, $y = 2 + 4x - x^2$

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

   i. Find the value of y when $x = 2$.

   ii. Draw the graph of the given quadratic function on the standard coordinate plane of a graph paper selecting a suitable scale.

   iii. Using the graph, find the range of x for which $y \geq 1$

   iv. If the above quadratic function of x is given as, $y = k - (x - 2)^2$ find the value of the constant k.

   v. Using the graph find the values of x, when $y = 0$, hence obtain the value of $\sqrt{6}$ to one decimal point.

4) In order to do a certain activity in mathematics, Kavindi has prepared 47 identical sticks with equal lengths. She prepared 11 regular pentagons and equilateral triangles in total using all the sticks.

   i. Buildup a pair of simultaneous equations taking the number of pentagons and number of equilateral triangles prepared as x and y respectively.

   ii. Solving the simultaneous equations find the number of pentagons and triangles she prepared separately.

   iii. If Sansala who too was involved in the same activity has prepared $'a'$ number of pentagons and if that number agrees with the inequality, $\frac{1}{2}a - 5 + 2a \leq 2$, find the maximum number of regular pentagons she could prepare.

5) A right circular cylindrical shaped metal rod with radius, $2a$ and length l is melted and recast into 25 solid metal spheres each with radius a without wastage of material.

   i. Show that the length of the rod, $l = \frac{25}{3}a$

ii.   If $a = \sqrt{2}$ units, obtain the value of l to the nearest decimal number using logarithm tables.

6)   The following frequency distribution shows information about the daily income (to the nearest rupee) in 20 days of a grocer who runs a telephone booth in his compound.

Income (Rs)	100 – 140	140 – 180	180 – 220	220 – 260	260 – 300	300 – 340	340 – 380
No of days	1	3	4	5	4	2	1

i.   Estimate the mean daily income in the booth to the nearest rupee,

ii.   An employee working in the booth is paid Rs 5000 monthly by the grocer and also spends Rs 1 800 monthly for the maintenance of the booth. Workout his monthly (in 30 days) profit/loss in the business


Part B
Answer five questions only

7) a)   The first term and the seventh term of an arithmetic progression are 3 and 27.
   i.   What is the common difference of the progression?

   ii.   Which term of the progression is 59?

   iii.   What is the sum of the first 15 terms of the progression?

   b)   In a quiz competition, the price money for the successful answer of the first question is Rs 100 and thereafter the price money for every preceding question is   two times the money paid for the previous question and so on. The total number of questions presented is 8.

   What is the total price money a contender will receive for the successful answering of all 8 questions?

8) For the following construction given, use only a pair of compasses and a ruler with mm/cm scale and show all the construction lines clearly.

    i.   Draw a straight line segment of length 7.5cm and name it as AB.

    ii.   Construct the circle to which AB is a diameter.

    iii.   Obtain the location of the point P such that AP = 6cm and $A\widehat{P}B = 90^0$ and measure the length of PB.

    iv.   Obtain the point Q on the line drawn through P parallel to BA which meets the circle at Q such that $P\widehat{A}B = P\widehat{Q}B$.

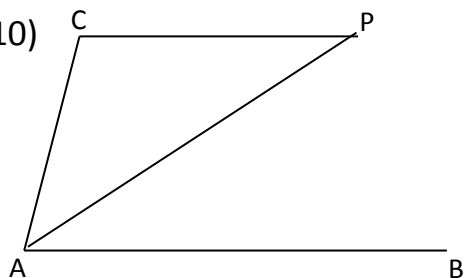   v.   Construct a tangent to the circle at Q

9)
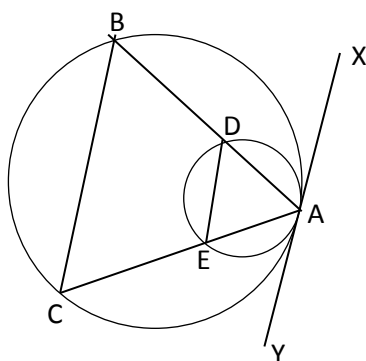
The smaller circle touches the larger circle inside of it at the point A as shown and the tangent XAY is drawn common to both circles at A. The two chords AB and AC intersect the smaller circle at D and E.
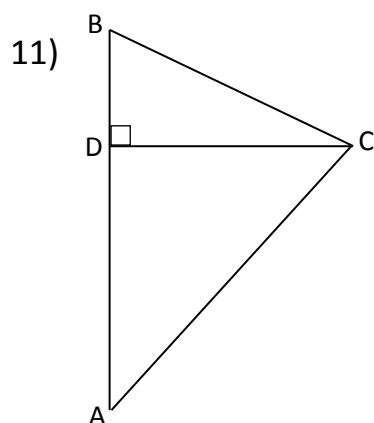
    i.   Show that ΔABC and ΔADE are equiangular.

    ii.   If DB = 2 AD, show that BC = 3 DE.

10)

AP bisects the angle $C\widehat{A}B$ in the picture and AC = CP.

    i.   Copy down the illustration onto your answer script and mark all the information given on it and show that AB // CP.

    ii.   The bisector of $A\widehat{C}P$ meets AP at Q and AB at R. Prove that $\Delta ACQ \equiv \Delta PCQ$

    iii.   If CQ = QR, show that quadrilateral ARPC is a rhombus.

11)

In the picture given, points A, B, C and D are located on the horizontal ground. AB is a straight line such that B is due north of A. The bearing of C from B is 110^0 and C is 60m away from B.

i. Copy down the illustration onto your answer script and find the magnitude of $C\hat{B}D$.

ii. If CD is perpendicular to AB, using trigonometric tables calculate the length of CD to the nearest metre.

iii. If the distance between D and A is 100m, calculate the bearing of C from A.

12) The information reveled in a survey done among 200 television spectators about their watching of three TV channels A, B and C is given in the following incomplete Venn diagram.
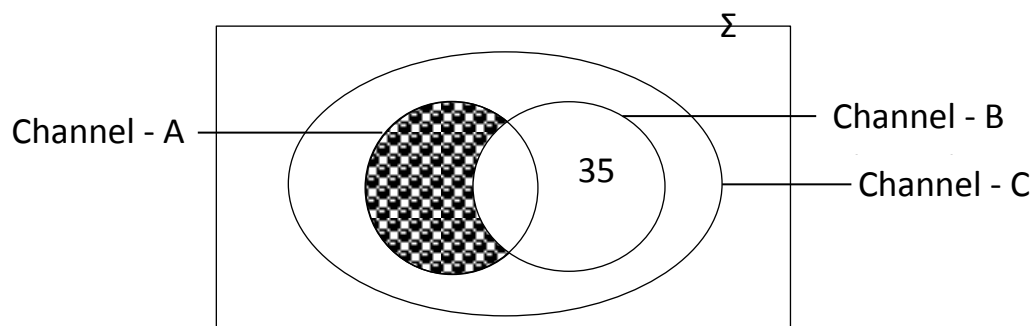
i. Describe in words the shaded region in the Venn diagram.
ii. If 50 people watch Channel- B, how many people watch all 3 channels?
iii. If 80 people watch none of the above channels, how many people watch channel-C?
iv. If 65 people watch channel-A, how many people watch only one channel?
v. But it was later revealed that there were 2 people who watch only channel A. Hence draw a new rectified Venn diagram to include revised information.

-End-