Southern Provincial Department of Education

Year End Test - 2020

Grade 10

Mathematics - II

Name / Index No. ..... Time - 03 hour

- Select 5 questions from part A and 5 questions from part B and write down the answer.
- Volume of a right circular cylinder of base radius "r" and height "h" is given by $\pi r^2 h$ and take $\pi = \frac{22}{7}$

Part - A

Answer only 05 questions.

(01) (a) Saman pays Rs. 84000 as the annual income tax. If the first Rs. 500 000 is income tax free, Next Rs. 500 000 the income tax percentage is 4% and for the next Rs. 500 000 the income tax percentage is 8 % and for the remaining income the income tax percentage is 12%. Find the annual income earned by Saman. (07 marks)

(b) Saman deposited Rs. 10 00000 from his income in a financial institute which pays 12% simple annual interest. Find after how many years he will receive Rs. 360 000 as the interest. (03 marks)

(02) The below frequency distributions show set of data regarding the number of fruits juice glasses sold during a month in a certain fruit shop.

Number of fruit juice glasses	10 - 12	13 - 15	16 - 18	19 - 21	22 - 24	25 - 27	28 - 30
Numbers of days	2	5	6	9	5	2	1

(i) What is the modal class (01 mark)

(ii) By taking the mid value of the modal class as the assumed mean or any other method find the mean number of fruit juice glasses sold during a day. (06 marks)

(iii) Price of a glasses of fruit juice is Rs 60. It during the next month only 25 days they sold fruit juice the shop owner said that the income of this shop exceed Rs 28000. By giving reasons state whether his statement is true or false. (03 marks)

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

x	-3	-2	-1	0	1	2	3
y	14	4	-2	.....	-2	4	14

(a) (i) Find the value of y when $x = 0$ (01 mark)

(ii) Using the scale to small divisions along the x axis as one unit and 10 small divisions along the y axis as two units, draw the graph of the above function. (02 marks)

(b) Using the graph

(i) Find the lowest value of the function (02 marks)

(ii) Roots of the equation which formed when $y = 0$ (02 marks)

(iii) Internal of value of x which the function increasing positively. (02 marks)

(04) (a) Make "l" the subject of the fomula $T = 2\pi\sqrt{\frac{l}{g}}$ (03 marks)

(b) Price of a mango is Rs. 5 more than twice the price of a banana. The price of 3 mangoes and a banana is Rs. 85.

(i) By taking price of a mango as Rs.x and banana as Rs. y build up a pair of simultaneous equation. (02 marks)

(ii) By solving the above simultaneous equations find the price of a banana and mango (05 marks)

(05) (a) Solve $\frac{5}{x-1} - \frac{7}{3(x-1)} = 2\frac{2}{3}$ (03 marks)

(b) ABCD is parallelogram. DE is the perpendicular to AB from D. Length of DE is 3cm less than the length of AB. Area of ABCD parallelogram is $40cm^2$. By taking the length of AB as x centimeter build up a quadratic equation using x and by solving it find the length of AB. (07 marks)

(06) AB and PQ are vertical buildings. Height of AB is 20m. The angle of elevation of the top Q of the PQ building from the top B of the AB building is 30^0 and the angle of depression of P from B is 45^0

(i) Mark the above information in a sketch (02 marks)

(ii) Draw a scale diagram using the scale 1 : 400 (03 marks)

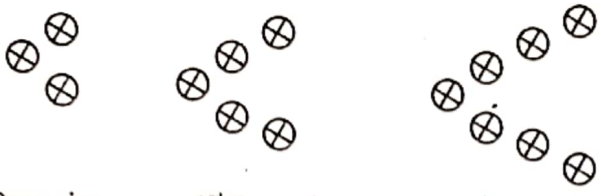
(iii) Find the height of the PQ building (03 marks)

(iv) Measure and write the angle of elevation of Q from A (02 marks)

Part - B

Answer only 05 questions.

(07) The below figure shows how the bulbs are arranged in a certain decoration.



1st Occassion 2nd Occassion 3rd Occassion

(i) Write down the number of bulbs used for the 1st, 2nd and 3rd occasions. (01 mark)

(ii) How many bulbs were there in the 10th occasions. (02 marks)

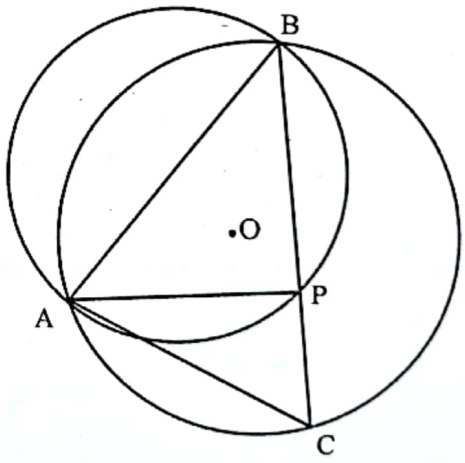
(iii) If there were only 10 occasions in the above decoration find how many bulbs in total in this decoration (02 marks)

(iv) An electrician said that if there are 130 extra bulbs he can arrange the above decoration up to 15 occasions. Is his statement is true or false. Give reasons. (04 marks)

(v) How many boxes of bulbs are needed for the 15 occasions if 50 bulbs are in box (01 mark)

(08) ABCD is a quadrilateral such that AB = 4.5*cm*, BC = 6.5*cm* $\hat{ABC} = 60^0$, BC = AD and BC // AD. Construct the ABCD quadrilateral using the given data and by giving reasons, give a suitable name for that quadrilateral. (10 marks)

(09) The two circle in the given figure are intersect at A and B. AB is a diameter of APB circle and O is the center of ABC circle. It is given that $\hat{ABC} = x$.
Write down the answers for the following questions with reasons.



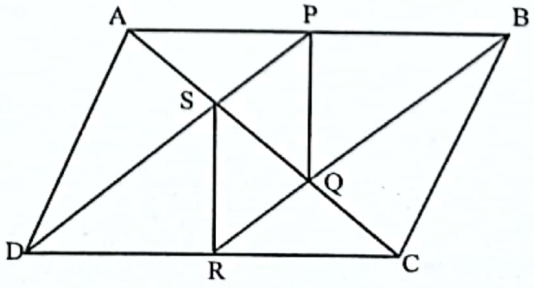
(i) Find the value of $\hat{APB}$ (02 marks)

(ii) Write the value of $\hat{BAP}$ in terms of x (02 marks)

(iii) Write the value of $\hat{AOC}$ in terms of x (02 marks)

(iv) Show that $\hat{BAP} = \hat{OAC}$ (04 marks)

(10) The mid points of the sides AB and DC are P and R respectively of the ABCD parallelogram. DP and RB lines are intersected by AC at S and Q points respectively.
Show that,



(i) AP = RC (02 marks)

(ii) APD Δ ≡ BRC Δ (02 marks)

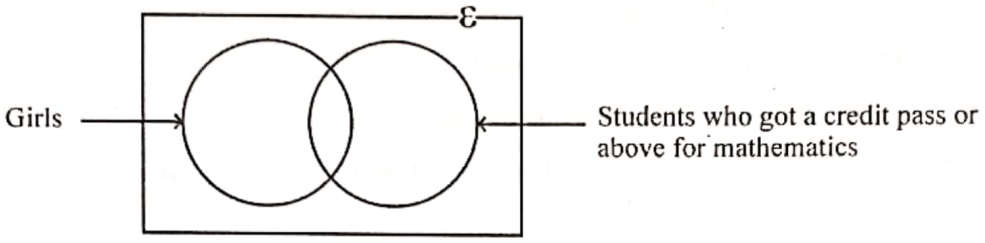
(iii) DP // RB (02 marks)

(iv) APS Δ ≡ QRC Δ (02 marks)

(v) PQRS is a parallelogram (02 marks)

(11) Base radius and height of a solid metal cylinder are 12cm and 28cm respectively. By melting that cylinder 22 solid prisms are made with height 16.28cm and area of the cross section "a" square centimeters. If there are no wastage in metal show that $a = \frac{144}{4.07}$ and find the value of "a" to the first decimal place using logarithm tables. (10 marks)

(12) The below venn diagram shows a collection of data regarding 60 students who passed the G.C.E.(O/L) examination in a certain school.



From the students 31 were girls and 16 of them got credit pass or above for mathematics. 9 boys didn't have a pass for mathematics.

(i) Copy the given venn diagram and write the number of elements in each region. (04 marks)

(ii) How many girls were there who didn't receive a credit pass or above for mathematics. (02 marks)

(iii) Shade the region in the above venn diagram which represent the boys who received a credit or above for mathematics. (02 marks)