GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
SECOND TERM EXAMINATION
MODEL PAPER (2022 – 2023)

STD : X MAX MARKS : 40
SUBJECT : MATHEMATICS (E) - LEVEL 2 TIME : 1hr 45 minutes

INSTRUCTIONS : i) Answer each main question on a fresh page .
ii) All questions are compulsory.
iii) The question paper consists of four questions , each of 10 marks
iv) There is no overall choice.
v) In questions on constructions , the drawing should be clear and exactly as per the given measurements. The construction lines and arcs should be maintained.
vi) Use of calculators and mathematical tables is not permitted.

Q1A) Find the class size of the class intervals 25 – 55 , 55 – 85 , 85 – 115,… (1)

B) Attempt the following : (2)
(i) Write the first four terms of an AP having first term as 19 and common difference as -3 .
(ii) State with reason if the given list of numbers is an AP or not.
1 , 3 , 9 , 27 ,…

C) Answer the following questions with reference to the given Arithmetic Progression : 11 , 15 , 19 , 23 , … (3)
(i) Find the 20^{th} term of the AP.
(ii) Find the sum of the first 12 terms of the AP.
(iii) Find which term of the AP is 91.

D) The following table shows the donation given by 50 students towards a Charitable trust.

Donation in Rs C.I	No of students f_i	Class marks x_i	$f_i x_i$
0 - 20	5	_____	_____
20 - 40	8	_____	_____
40 - 60	10	_____	_____
60 - 80	12	_____	_____
80 - 100	7	_____	_____
100 - 120	8	_____	_____
	$\sum f_i$ = 50		$\sum f_i x_i$ =

Rewrite and complete the table and find the mean donation by using the Direct Method . (4)

Q2A) Attempt the following : (2)

(i) If the sum and product of the roots of the quadratic equation are 5 and – 6 respectively , then write the quadratic equation in x .

(ii) If one root of the quadratic equation $2x^2 + m\,x - 15 = 0$ is – 5, then find the value of m .

B) Find the mode of the following frequency distribution table : (2)

Class Interval	Frequency
20 - 30	5
30 - 40	12
40 - 50	20
50 - 60	8

C) Find the roots of the Quadratic Equation $5x^2 - 14x + 8 = 0$ by using the " Factorisation Method ." (3)

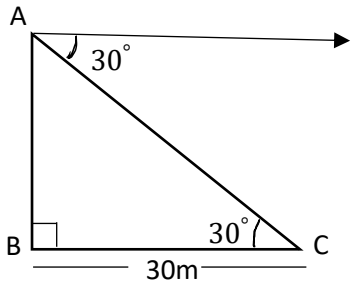
D) Find the roots of the Quadratic Equation $3x^2 - 4x - 7 = 0$ by using the " Quadratic Formula Method." (3)

3A) Find the total surface area of a hemisphere of radius 7cm. (1)
(Do not substitute the value of π)

B) Draw a line segment AB of length 7.5cm . Taking A as centre and radius 3cm , draw a circle. Using a pair of compasses and ruler , Construct tangents BP and BQ to the circle .
Measure and state the length of the tangent segments. (3)

C) Construct Δ PQR with sides PQ = 6.5cm , QR = 7cm and ∠ PQR = 60°.
Using a pair of compasses and ruler , construct Δ P'QR' similar to Δ PQR whose sides are $\frac{3}{4}$ of the corresponding sides of Δ PQR . (3)

D) From the top 'A' of a tower ' AB ' a man finds that the angle of depression of a car at point 'C' on the ground to be $30°$. If the car is at a distance of 30m from the foot of the tower , then find the height of the tower. (3)
(Take $\sqrt{3}$ = 1.73)

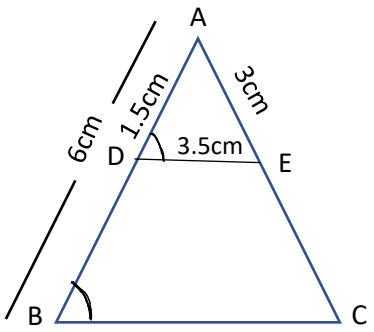


4A) Two identical solid cubes of side 2cm are joined end to end . Find the volume of the resulting cuboid. (1)

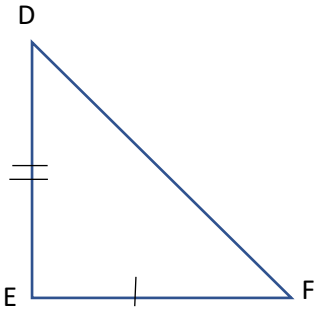
B) D and E are points on the sides AB and AC respectively of ΔABC , such that $\angle$ ADE = $\angle$ ABC . If AD = 1.5cm , AB = 6cm , AE = 3cm and DE = 3.5cm , then

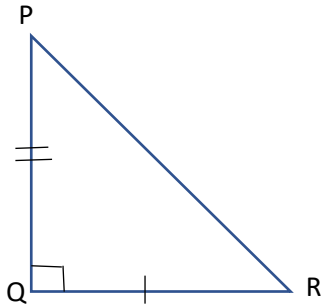
find i) EC

ii) BC (2)



C) With reference to the given figure and the given conditions , write only the proof with reasons of the following theorem :





Given : In Δ DEF , $DE^2 + EF^2 = DF^2$

Δ PQR is constructed such that PQ = DE , QR = EF and $\angle$ Q = 90^0

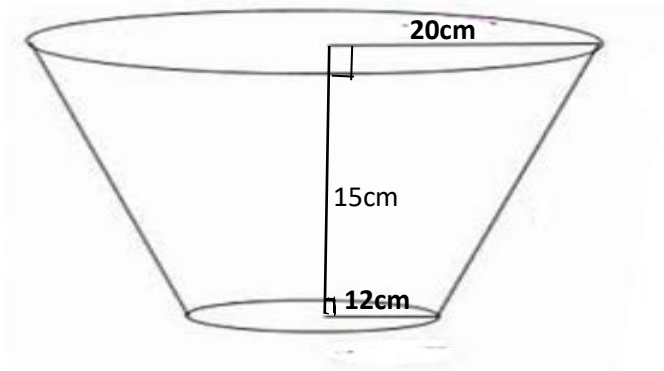
Prove that : Δ DEF is a right angled triangle. (3)

D) Attempt the following :

(i) In the figure given below an open steel bucket is in the shape of a frustum of a right circular cone of height 15cm . If the radii of its lower and upper ends are 12cm and 20cm respectively , then find

a) The slant height of the bucket

b) The curved surface area of the bucket (2)
(Do not substitute the value of π)



ii) A solid metallic cylinder of base diameter 6cm and height 32cm is melted to form 8 solid spheres of the same size.
Find the radius of each sphere. (2)

xxxxxxxxxxxxxxx The End xxxxxxxxxxxxxxxxxx