

MATHEMATICS 4 PERIODS
PART B

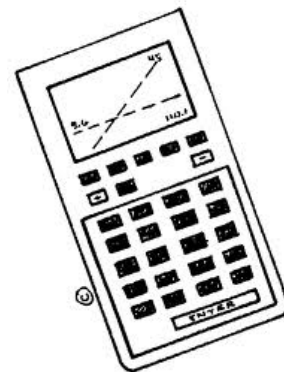
DATA: 15th June 2021, from 9h20 to 10h05

DURATION OF EXAMINATION:

$\frac{3}{4}$ hour (45 minutes)

AUTHORISED MATERIAL:

Examination with technological tool
Non-programmable, non-graphical scientific calculator
Pencil and ruler



SPECIFIC INSTRUCTIONS:

- Use a different page for each question.
- Answers must be supported by explanations.
- They must show the reasoning behind the results or solutions provided.
- If graphs are used to find a solution, they must be sketched as part of the answer.
- Unless indicated otherwise, full marks will not be awarded if a correct answer is not accompanied by supporting evidence or explanations of how the results or the solutions have been achieved.
- When the answer provided is not the correct one, still some marks can be awarded if it is shown that an appropriate method and/or a correct approach has been used.
- Some of the questions can be answered only with the help of the calculator. The wording of these questions makes this clear. All other questions can be solved with or without the use of a calculator.

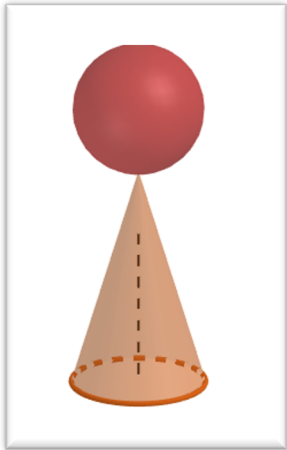
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B1 Probability		Page 1/2																
		marks																
1)	<p>In a class there are 15 students, 9 students like geography and 10 students like science. Knowing that 2 students like neither geography nor sciences:</p> <p>I. Represent the situation with a Venn diagram.</p> <p>II. Determine the probability that a student randomly selected likes geography and not science.</p> <p>III. Determine the probability that a student randomly selected among the students who like science, he/she does not like geography</p>	<p>10 marks</p> <p>3 marks</p> <p>3 marks</p> <p>4 marks</p>																
2)	<p>A survey of smoking habits conducted on 200 people (90 women and 110 men) says that only 140 people do not smoke. Amid smokers, 40 are men.</p> <p>I. Fill in the two-way table below.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th></th> <th style="text-align: center;">Women</th> <th style="text-align: center;">Men</th> <th style="text-align: center;">TOTAL</th> </tr> </thead> <tbody> <tr> <th style="text-align: left;">Smokers</th> <td></td> <td></td> <td></td> </tr> <tr> <th style="text-align: left;">Non smokers</th> <td></td> <td></td> <td></td> </tr> <tr> <th style="text-align: left;">TOTAL</th> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>II. Determine the probability that a randomly selected person is a woman and does not smoke.</p> <p>III. Determine the probability that a randomly selected person is a man, knowing that he is not a smoker.</p>		Women	Men	TOTAL	Smokers				Non smokers				TOTAL				<p>10 marks</p> <p>4 marks</p> <p>3 marks</p> <p>3 marks</p>
	Women	Men	TOTAL															
Smokers																		
Non smokers																		
TOTAL																		

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PARTE B														
B2 STATISTICS			Page 1/1			marks								
4)	<p>The table below shows the distribution of times obtained by 10 contestants during a sport competition.</p> <table border="1" style="margin-left: auto; margin-right: auto;"><tbody><tr><td style="padding: 2px;">time x</td><td style="padding: 2px;">10</td><td style="padding: 2px;">20</td><td style="padding: 2px;">30</td><td style="padding: 2px;">40</td><td style="padding: 2px;">50</td></tr><tr><td style="padding: 2px;">Frequency f</td><td style="padding: 2px;">1</td><td style="padding: 2px;">2</td><td style="padding: 2px;">4</td><td style="padding: 2px;">2</td><td style="padding: 2px;">1</td></tr></tbody></table>	time x	10	20	30	40	50	Frequency f	1	2	4	2	1	15 marks
time x	10	20	30	40	50									
Frequency f	1	2	4	2	1									
	I. Determine the mean of x ;	4 marks												
	II. Determine the standard deviation σ ;	4 marks												
	III. Determine the interval related to 68% of the time.	3 marks												
	IV. Draw a histogram representing the situation.	4 marks												

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PART B		
B3 GEOMETRY		Page 1/1
		marks
5)	<p>The new spray bottle of the perfume « <i>Profumo di Parma</i> » is made by a cone and a sphere on top of the vertex of the cone (see figure below).</p> <div style="text-align: center;">  </div> <p>The height of the cone is 10 cm and the diameter of the base is 6 cm. The radius of the sphere is 3 cm.</p> <ol style="list-style-type: none"> I. Determine the surface of the whole bottle (cone and sphere) II. Determine the volume of the bottle (cone and sphere). III. A gift box contains 3 bottles of perfume. The box is a cuboid whose edges are 20 cm, 20 cm, 10 cm. How much free space is left? IV. Determine the angle between the base of the cone and the slant height. 	15 marks
		4 marks
		4 marks
		4 marks
		3 marks