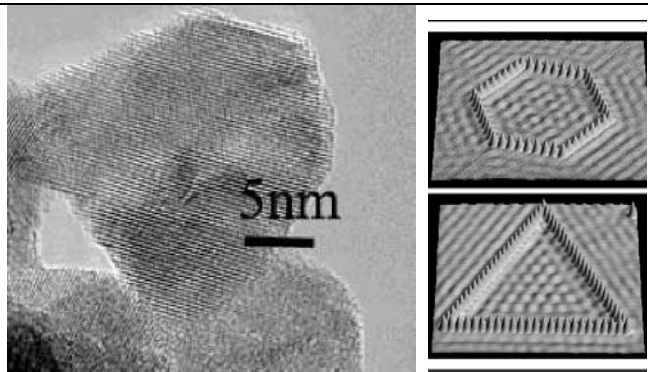
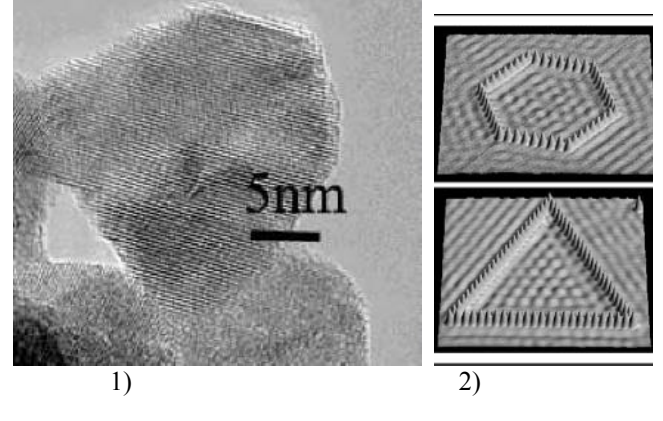


Name:

DNI:

Maximum time 1:30 h.

1	<p>Which technique is more accurate to measure the resistance of</p> <p>Choose answers among:</p> <p>A) two electrodes B) Three Electrodes C) Four electrode "standard" D) Four electrodes Van der Pawn</p>	<p>a) A solid thin film b) A uniform solid cylinder c) A liquid</p>
2	<p>Indicate the technique used to take the pictures on the right</p> <p>Possibilities:</p> <p>A) SEM B) TEM C) AFM D) STM E) Confocal microscope</p> <p>Note: if you have doubts you may mark up to two answers.</p>	 <p>1) 2)</p>
3	<p>Mark True or False</p> <p>Hematite (Fe_2O_3) is used in Water splitting as</p>	<p><input type="checkbox"/> Photoanode <input type="checkbox"/> Photocathode <input type="checkbox"/> light absorber <input type="checkbox"/> Produces oxygen <input type="checkbox"/> Produces hydrogen</p>
4	<p>Mark if the following affirmations are True or False</p>	<ul style="list-style-type: none"> - In immunosensors, antigen are unspecific - Binding sites in antibodies are at the Fragment crystalizable - A rat may power a led - Bilirubin oxidase uses oxygen to produce water - Glucose oxidase provides electrons from glucose
5	<p>Mark if the following affirmations are True or False</p>	<ul style="list-style-type: none"> - A Lithium battery may provide more than 3V - A supercapacitor may store more than 20 Wh/kg - A PbS battery may store more than 20 Wh/kg - A PbS battery may deliver more than 10 kW/kg - A supercapacitor may provide more than 10 kW/kg - Increasing porosity is a good strategy for high capacitance
6	Describe the tunnel effect	
7	Describe the behaviour of a pn junction under forward and reverse applied potential.	
8	Draw a scheme of a MOSFET transistor and describe how it works.	
9	In a Dye solar cell, describe: Components, Energy level schematic, working principles.	
10	Describe the working principles of a WO_3 electrochromic window.	

1	<p>-Quina tècnica és més adequada per medir la resistència de</p> <p>Tria una resposta entre:</p> <p>A) two electrodes B) Three Electrodes C) Four electrode "standard" D) Four electrodes Van der Pawn</p>	<p>a) Un film fi b) Un cilindre solid uniform c) Un líquid</p>
2	<p>Indica la tècnica que se ha utilizado para tomar las fotos de la derecha</p> <p>F) SEM G) TEM H) AFM I) STM J) Confocal microscope</p> <p>Note: Si tens dubtes, pots utilitzar fins dues respostes</p>	 <p>1) 2)</p>
3	<p>Marca vertader o fals;</p> <p>Hematita (Fe_2O_3) se utilize en la photohidrolisis Water splitting for</p>	<p><input type="checkbox"/> Photoanode <input type="checkbox"/> Photocathode <input type="checkbox"/> light absorber <input type="checkbox"/> Produces oxigen <input type="checkbox"/> Produces hidrogen</p>
4	<p>Marca si las siguienets afirmacions son vertaderes o falses</p>	<p>- In immunosensors, antigen are unspecific - Binding sites in antibodies are at the Fragment crystalizable - A rat may power a led - Bilirubin oxidase uses oxygen to produce water - Glucose oxidase provides electrons from glucose</p>
5	<p>Marca si las siguienets afirmacions son vertaderes o falses</p>	<p>- A Lithium battery may provide more than 3V - A supercapacitor may store more than 20 Wh/kg - A PbS battery may store more than 20 Wh/kg - A PbS battery may deliver more than 10 kW/kg - A supercapacitor may provide more than 10 kW/kg - Increasing porosity is a good strategy for high capacitance</p>
6	Describe the tunnel effect	
7	Descriu el comportament d'una unió <i>pn</i> polaritzat en directa i en inversa	
8	Dibuixa l'esquema d'un transistor MOSFET I descriu com treballa	
9	En una cel·lula de colorant, descriu: Components, esquema del nivell d'energia	
10	Descriu els principis de funcionament d'una finestra electrocromica de WO_3 .	