CODI: 46020479
C. Enric Soler i Godes, s/n
96 282 94 00 - 46020479@edu.gva.es
portal.edu.gva.es/iesjoanfuster
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UNIT 1: METALS

1. Metals are good …………............... and ………………...conductors

2. They have high / low density

3. They are …................. at room temperature

4. Which metal is not solid at room temperature?………………………………………….…………...

5. What happens when they are heated at a high temperature?………..……………………………..……...

6. Alloys are …………….. of two or more ………………….. of which al least one must be a …………...…

7. They …................. when heated and …................. when cooled.

8. Many metals are m...................

9. Many metals are d.................

10. They have considerable mechanical …........................

11. Mining consists of …....................... minerals from …...................

12. Metallurgy separates the …..................... from …................. the mineral

13. Metallurgy generates …..................... products such as …..................., …....................,…...............

14. The most common commercial forms of these semi-finished products are …........... and …............... from different sections …..................., …...................., and …...................

15. What do ferric metallic materials contain?……………………………………………………………….

16. According to this, how are ferric metals classified?…………………………………………………..

17. When metallic products are collected, the usable metal they contain is…………………………………..

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18. When metallic products are recycled, it is classified and sent back to the ……………….. industry

19. Why is pure iron rarely used?…………………………………………………………………………...

20. Which one are the most used ferric metals?…………………………………….…………………..…...

21. How are iron and steel products classified?…………………………………………………………..…..

22. How much carbon does steel contain?………………………………………………………………..…...

23. How much carbon does foundry contain?……………………………………………………………..…...

24. Steel properties are:

    a. ……………. resistant

    b. ……………. to weld

25. What does Chromium make and give to the steel?……………………………………………….………

26. Foundry ……………… easily and have a lot of ………………… in its liquid state.

27. Properties of foundry:

    a. They are …………….. or ………………

    b. They generally cannot be ……………… and ………………………

    c. It is ……….……….. resistant and are more ………….……

UNIT 2: MECHANICS 1

LEVERS 1

LEVERS ARE SIMPLE MACHINES

1. They are made up of a rigid bar and a point of suport which is also called resistance. TF

2. They are normally used to exert a ……………………… usin only a ………………………
3. They are a type of force ………………………

MECHANICAL ADVANTAGE AND MECHANICAL DISADVANTAGE

4. When the lever………………….. the inicial force, we can say it has a mechanical ………..

5. All the levers have a mechanical advantage. T F

6. A large force is applied to overcome a small force: this is referred as a …………..

 ……………………………………………………………………………………………

PARTS OF LEVERS

7. The parts of a lever are ………………………………………………………………….

 ……………………………………………………………………………………………

LAW OF THE LEVER

8. Write the equation of the law of the lever.

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TYPES OF LEVERS

9. Draw and write the 3 types of levers. Write the name of every exemple.

10. Write the name of every type of level, first class, second class, third class lever:

……………………….. ………………………………. ……………………………
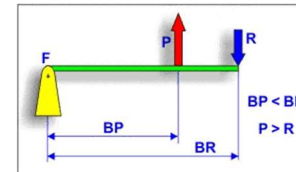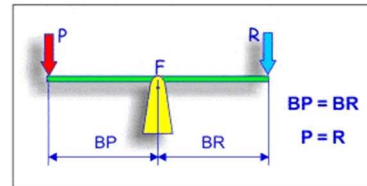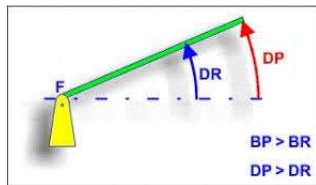
PULLEYS AND HOISTS

PULLEYS

11. Pulleys are wheels with the lateral surface adapted, usually in the form of a channel. So that rope or belt may come in contact without coming off. T   F

12. Pulleys are ………….. with the lateral surface adapted, usually in the form of a ……………. So that rope or belt may come in contact without ………………...

13. A single pulley multiplies the applied force, and changes its direction. T   F

14. A single pulley…….……..…… multiply the applied force, ……………….. change its direction

HOISTS

15. A hoist is a combined set of pulleys that allows us to lift a low weight by applying a little strength. T F

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16. Hoists are formed by …………….. pulleys and ……………… pulleys.

17. The less pulleys a hoist has, more force must be exerted to lift the load, but also the lower the amount of rope that has to be pulled. T   F

18. Write the equation to calculate the force F in a hoist. What does it mean "n"?

19. Which mechanical advantage every pulley in a hoist provides?.............

20. If I want to lift a weight of 120 kg in a hoist with 3 movable pulleys, which force do I have to apply? Write the equation and calculate it.

TRANSMISSION WITH PULLEYS

21. If we join two pulleys through a ………., we can transmit the ……….………….. movement of one pulley to the other.

22. This is a transmission mechanism which is not useful for machines that do not require much power. T   F

23. The pulley that transmits the movement is called motor or ………….. pulley, and the pulley that receives the movement, output or ……………. pulley.

24. Draw the unitari transmission. Write the name to the motor and to the output pulley

25. In unitary transmission, the two pulleys are equal or different?

26. In unitary transmission, the output pulley will rotate at the same speed as the motor pulley. T F

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27. Draw the multiplier transmission. Write the name to the motor and to the output pulley.

28. If the output ………... is smaller than the ………... one, it will rotate ………... It is a speed …………………... mechanism.

29. Draw the reductive transmission. Write the name to the motor and to the output pulley.

30. If the output pulley is larger than the ……… one, it will rotate more ………….. It is a speed ………………. mechanism.

31. Write the equation to calculate the rotation speed of the output pulley.

GEARS 1

INTRODUCTION TO GEARS

32. Draw a gear.

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33. The fundamental characteristics of a gear is the number of ………………..

34. The teeths are represented by the letter …………..

35. The rotational speed of a gear is represented by the letter ………………….

36. The speed is measured in ………..

SPEED REDUCER MECHANISM

37. The motor gear is bigger than the output gear. T   F

38. Draw a speed reducer mechanism with gears.

SPEED MULTIPLIER MECHANISM

39. The motor gear is smaller than the output gear. T   F

40. The motor gear is ……………. than the output gear

41. Calculate the speed of the output gear (Ns) if Nm = 24 rpm, Zs = 40 teeth and Zm = 10 teeth.

TRANSMISSION RATIO IN GEARS.

42. Calculate "i" if Zm = 20 teeths and Zs = 60 teeths

TRANSMISSION RATIO FROM THE ROTATION SPEED OF THE GEARS

43. Write the formula to calculate the transmission speed based on the speed of the gears.

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44. Calculate "i" if Ns = 10 and Nm = 20.

UNIT 3: ELECTRICITY 1

THE ELECTRIC CIRCUIT

STRUCTURE OF THE ATOM

1. The center of the atom is known as the ……………………

2. The particles in the nucleus are ……………, with a …………………., and neutrons ………………..

3. Electrons are particles with a ……………………..

4. Electrons revolve ……………………….…… and they are responsible for forming the energy that we call ………………..

CONDUCTORS AND INSULATORS

5. In conductors, some of the electrons are ……………… joined to the atom. If a force is applied from the exterior, the ……………… can travel from …………… to ……………..

6. Any material that allows electricity to pass through it, is known as ………………………………

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THE ELECTRIC CURRENT

7. When there are a very high number of ………………….. travelling through a ………………….. material, we say that an electric …………………. is circulating.

THE ELECTRIC CIRCUIT

8. An electric circuit is a closed path through which electrons ………………….

9. This type of path is made up of …………… and other electrical ……………….

10. In an electric circuit a …………………… of energies is ……………………….

FAMILIES OF ELECTRICAL COMPONENTS

11. Generators ……………….. electric ……………… to the circuit

12. Receptors ………………….. the energy from the electric ……………into useful …………

13. Conductors allow the electric current to …………………..

14. Control elements ……………….. the electric circuit

15. Draw the electrical symbol of the:

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wire	electric motor	buzzer	battery	button	switch	light bulb

THE ELECTRICAL DIAGRAM

16. Electrical components are connected to each other to form ……………………

17. Draw an electrical diagram for the circuit made up of one battery, a light bulb and two wires

18. Draw an electrical diagram to switch on a light bulb with a battery and a switch

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19. Draw an electrical diagram to switch on a light bulb with a battery and a button

OPEN OR CLOSED CIRCUIT

20. When do we say that the electric circuit is closed? Write a complete sentence

……………………………………………………………………………………………..

……………………………………………………………………………………………..

21. When do we say that the electric circuit is open ? Write a complete sentence

……………………………………………………………………………………………..

……………………………………………………………………………………………..

22. Draw a closed and an open circuit diagram

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THE DIRECTION OF THE CURRENT (A HISTORICAL MIX-UP)

23. The electrons travel from the ……………… pole to the …………………….. of the generator.

24. Draw an electrical diagram of a light bulb and an electric motor controlled by a switch.

25. Draw an electrical diagram of a buzzer controlled by a button.

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ELECTRICAL COMPONENTS

FAMILIES OF ELECTRICAL COMPONENTS

26. The families of electrical components are:...

……………………………………………………………………………………………..

ELECTRICAL MAGNITUDES

27. A magnitude is anything that can be measured, for example ………………………………………………………………………………………

28. The most important electrical magnitudes are:...

ELECTRICAL RESISTANCE

29. The resistance is …………………… to the passage of the …………………………

30. The unit of measurement for resistance is the …………… White the simbol …………..

VOLTAGE

31. Voltage is measured in ……………….. It is abbreviated using the letter ……………..

32. Electrical voltage is the ……………………….. that …………………….. uses to propel ………………… flowing in an electric circuit.

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ELECTRIC CURRENT

33. The flow of electrons is called …………………………………

34. Amperage can be defined as the amount of ……………………………… that passes through a cross-section of a conductor each …………………

35. Electric current is mesured in …………………. It is abbreviated using the letter ……………..

OHM'S LAW

36. Write the three equivalent equations of Ohm's law.

37. Calculate the Voltage of a battery in a circuit with a resistance of 30 Ohms and 1 A of amperage.

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