PHYS 418

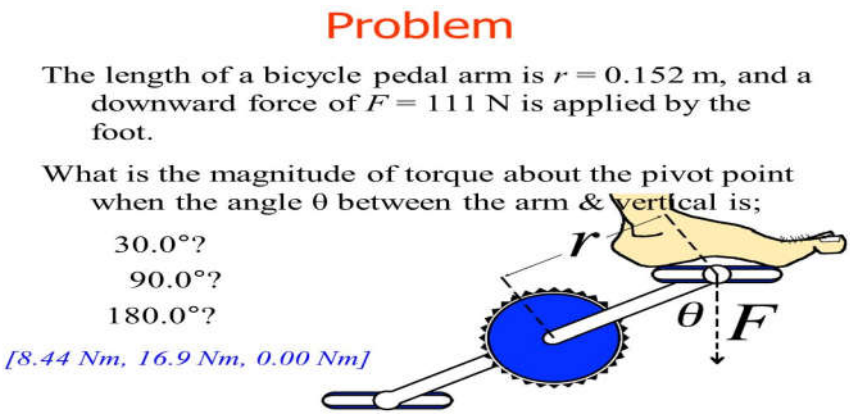
MATERIAL ADAPTATION AND DEVELOPMENT IN PHYSICS EDUCATION

QUESTION BANK – 2018 - 2019

These questions were taken from the handouts. They are the same.

1. **Question: Take g=10 m/s^2 and Pi: 3, calculate the period of a pendulum with length 1.6 m.**
2. **Question: Calculate frequency of a motion which has a period of 4 seconds.**
3. **Question: How can use bicycle to teach circular motion? Explain.**
4. **Question: Explain circular motion and uniform circular motion.**
5. **Question: If an object has a velocity of 5 m/s^2 and a radius of 2 m making circular motion,**
   i. **calculate its centripetal acceleration**
   ii. **If the mass of the object is 5 kg, calculate its centripetal force.**
6. **Question: How can you use bicycle to teach friction force? In which parts of bicycle there are frictions?**
7. **Question: How can you use bicycle to explain angular momentum?**
8. **Question: How can you produce electricity with a bicycle?**
9. **Question: How can you use a bicycle for getting white colour from the mixture of seven colours?**
10. **Question: How can you explain: Newton's 1st law with eggs?**
11. **Question: Show on the picture:**
    i. **where are the friction forces?**
    ii. **Gravitational force**
    iii. **Normal forces**
    iv. **Torque**
    v. **Tension force**

12.



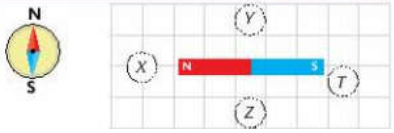
13. **Question: How can you show that magnetic field can pass from air, glass, water, wood, glass and oil?**
14. **Question: Why do we use U magnet?**

15.

Example 2.10

Speed of light

If we put a compass at the points X, Y, Z and T, what will the position of the compass' needle be?



16. Question: What does the resistance of a wire depend?

17. Question: What is a Rheostat?

18. Question: What is electrostatics?

19. Question: How can you make an electroscope?

20.

1. Which one of the statements below is correct?

A) An electric current passing through a wire produces a magnetic field.

B) A soft iron core attracts magnetic materials when a current is applied to it.

C) A magnet is a source of electricity.

D) An electromagnet has only one pole.

21.

2.

Which one of the statements below is not correct with respect to the electromagnet above.

A) It is a permanent magnet.

B) The iron produces a magnetic field in the space around it.

C) One end of the nail becomes a north pole.

D) Direct current flows through the circuit.

22.

Exercise (2.2)

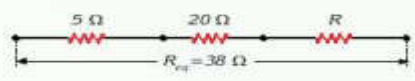
Series combinations

If the applied voltage is 6 V in the circuit given above, calculate the current flowing in the circuit. Ans: 0.04 A

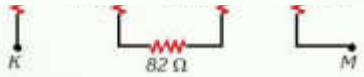
23.

1. What is the resistance R in the circuit?

What



A) 25 Ω B) 18 Ω C) 13 Ω D) 8 Ω



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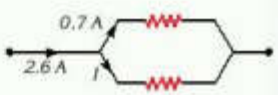
3. What is the current I in the circuit?



A) 3.3 A B) 2.6 A C) 2.1 A D) 1.9 A

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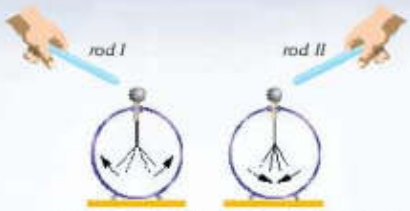
7.



When rod (I) is brought close to the knob of a negatively charged electroscope, the leaves rise up, when rod (II) is brought close, the leaves drop down. What can be said about the charges on the rods?

	Rod I	Rod II
A)	–	–
B)	+	–
C)	–	+
D)	+	+

26. .

1. When an object is charged, which of the following changes?

A) the number of protons
B) the number of electrons
C) the number of neutrons
D) the number of protons and electrons

27. .

8. When a comb is rubbed through hair, it gains charge. What are the charges on the hair and the comb?

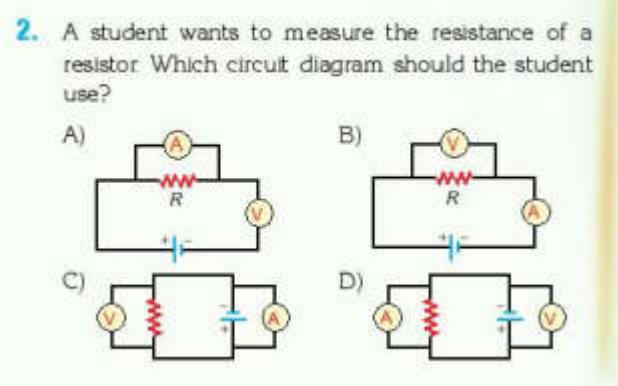
A) hair (–), comb (–)
B) hair (+), comb (+)
C) hair (–), comb (+)
D) hair (+), comb (–)

28. .

2. When you walk on a rug and then touch a conducting object, you often get an electric shock due to an electric discharge. Because

A) Electricity is produced due to friction between the rug and your body
B) Your body produces electricity
C) The rug produces electricity
D) The conducting object produces electricity

29. .

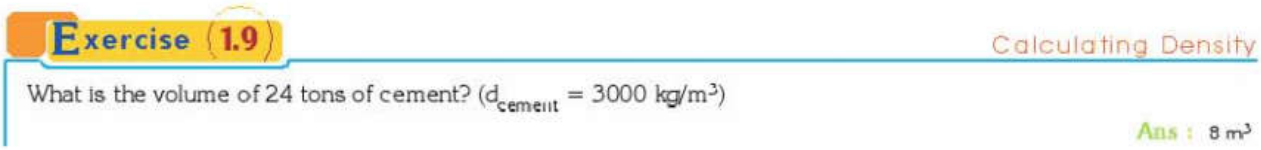


30. Question: What is density? How can you calculate density of a material? What is the equation to calculate density?

31. Question: How can you calculate the density of an egg?

32. Question: The volume of an egg is 60g and the volume of it is 62 cm^3. Calculate the density of the egg?

33.



34. Question: Water ice has a density of 0.91 g/cm^3. Imagine you have a cube of ice, 10 cm on a side. Calculate the cube's mass.

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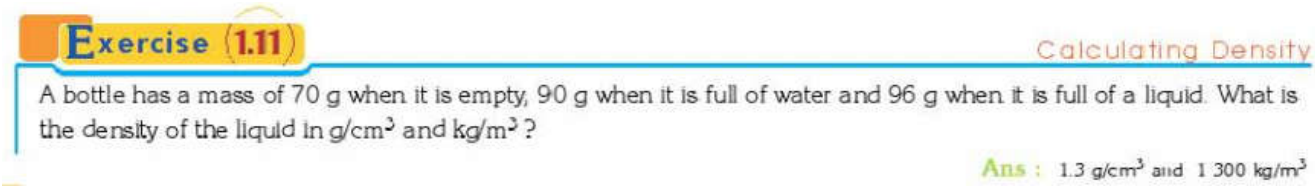


36. Question: What does the liquid pressure depend on?

37. Question: What does the combined vessel mean? Give examples from daily life for combined vessels.

38. Question: How can you show that air has pressure?

39. Question: When you suck the fruit juice through pipe from a fruit juice box, the box is compressed. How can you explain this event?

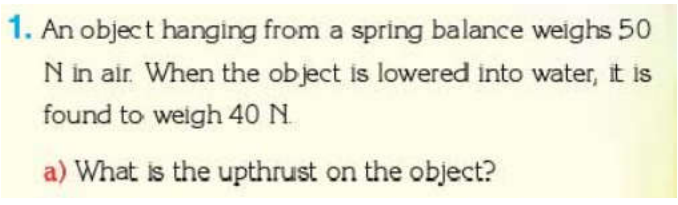
40. Question: What is Bernoulli's principle?

41. Question: What are applications of Bernoulli's principle in daily life?

42. Question: How can you show/prove Bernoulli's principle with a piece paper? Explain by drawing a figure.

43. Question: What is Buoyant force?

44. Question: What does the buoyant force depend on?



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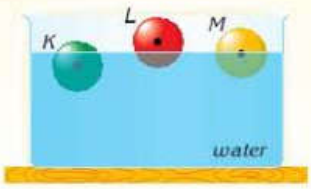
1.



Three balls constructed from different kinds of material K, L, M of the same volume, are floating in water as shown in the figure. Upthrust forces acting on the objects are F_K, F_L and F_M.

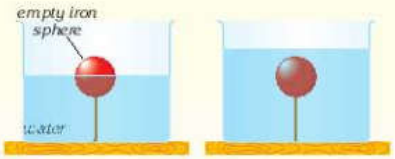
Which of the following statements is correct concerning these forces?

A) $F_K = F_L = F_M$ B) $F_K > F_L > F_M$

C) $F_K > F_M > F_L$ D) $F_L > F_M > F_K$

46. .

3.



An empty iron sphere is in equilibrium, as shown in the first figure. If some water is added to the container, as shown in the second figure which of the following statements may be observed?

A) Both tension in the string and upthrust force increase.

B) Both tension in the string and upthrust force decrease.

C) Tension in the string increases but upthrust force decreases.

D) Tension in the string decreases but upthrust force increases.

47. Question: Some materials are floating in a liquid. Arrange the materials below according to their densities.