Appendix - F

Final Achievement Test

On

Conceptual Understanding of the Physics Concepts

Name of the student: *Roll no:*

Date: *Std:*

Instruction:

All questions are compulsory. Do not leave any question blank.

Answer the following Questions as instructed:

1. A football and an iron ball are kept on the smooth floor of a moving bus. The brakes are suddenly applied to stop the bus. Which of the balls will start rolling fast and why?

2. A stone and the earth attract each other with an equal and opposite force. Why then we see only the stone falling towards the earth but not the earth rising towards the stone.

3. Ravi weighs few grams of sugar first at the poles and then at the equator. Will he observe the same weight in both the cases? Justify your answer.

4. Is it possible for a body to have zero velocity but constant acceleration? Justify your answer.

5. While riding a bicycle you need to continuously apply a force in order to make it move with constant speed. Why?

6. How is it possible for a Karate player to break a pile of tiles with a single blow?

7. Why is glass wares wrapped in straw or papers during its transportation?

8. Can a body have mass and no weight? Justify your answer?

9. Arrange the following substances in order of increasing density – rubber, smoke, honey and alcohol.

10. Why does a rubber ball rebound when struck against a hard floor?

11. Explain what makes it is difficult for a fireman to hold, a hose, which ejects large amount of water at a high speed?

12. Identify the kind of motion in the following cases:

    a) A car moving with constant speed turning around a curve.

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    b) An electron orbiting around nucleus

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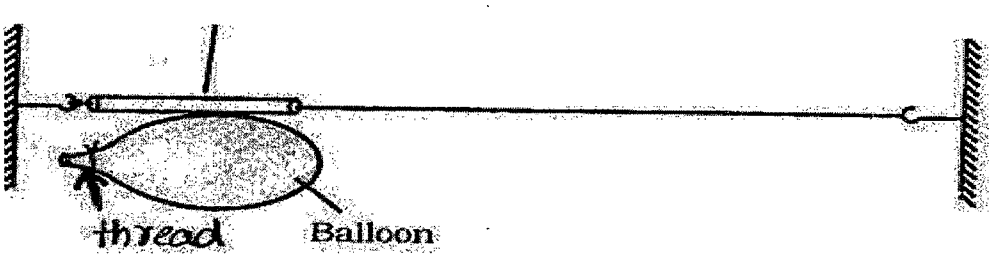
13. The length of a minute hand of clock is 7 cm. Find the distance and displacement of the minute hand from 8: 00 am to 8:30 am.

14. Observe the following diagram and answer the questions given below: Which direction does the balloon move when the thread tied to its neck is removed and why?

A

B



15. The motion of discus when athlete releases it is an example of Uniform circular motion. Do you agree? If yes give justification.

16. An astronaut carried a pot containing soil weighing 60 N from the earth to the surface of moon. He kept it there and just before return journey from moon to earth he weighed the soil there on the surface of moon and found that it was only 10 N. Where did the rest of the soil go and how much mass of soil was lost? Why this difference is observed?

17. Range of a spring balance used for measuring the minimum force required to just slide a block is 0-500 gwt. And it has a total of 20 divisions between 0-100gwt marks. What will be its least count?

18. Why a slight blow on a cork of bottle fully filled with a liquid sufficient to break the bottle?

19. Lead has greater density than iron and both are denser than water. Is the buoyant force on the lead object greater than, less than or equal to the buoyant force on an iron object of the same volume? Justify your answer.

20. Human corpse always floats on the surface of water, but the head stays within water. Explain why?

21. What kind of energy transformation takes place in an electric fan and a loudspeaker?

22. Can a body have energy without having momentum? Justify your answer.

23. A spring which is kept compressed by tying its ends together is allowed to be dissolved in an acid. What happens to the potential energy of the spring?

24. Anish strikes the pile of carom coins placed on the carom board. He observes that only the last coin moves away while the remaining falls vertically to its initial position. How could that be possible?

25. A boy stands at one end of a corridor, both the doors of which are closed. When he claps his hands together, the echo of the hand clap continues for a few seconds with decreasing loudness. Why?

26. Seema hears sound of distant horses by applying her ear to the ground whereas the sounds are inaudible when her ear is held at a little distance above the ground. Explain why it is so?

27. When we bite a toast , we hear a noise that is simply deafening. But for some reason, our friend sitting next to us hardly makes any noise while nibbling at the toast. Why?

28. What happens when a vibrating tuning fork is brought near a string with a paper rider on it?

29. Explain why the flash of a gun shot reaches us earlier than the sound of gun shot?

30. When an arrow is shot from a bow, it has kinetic energy. From where does it get the kinetic energy?

31. Take two test tubes one with 10 g of kerosene and the other with 10 g of glycerine. Now pour 100ml of water in both the test tubes. What will be your observations?

32. Given below are S.I. units of some physical quantities: Identify the physical quantities which are measured and expressed in the S.I Units given below:

a) ms^{-2} ----------

b) $Kg\ ms^{-1}$ ----------

c) $Kg\ m^{-3}$ ----------

d) $N\ m^{-2}$ ----------

33. State whether the force is balanced or unbalanced in the following situations.

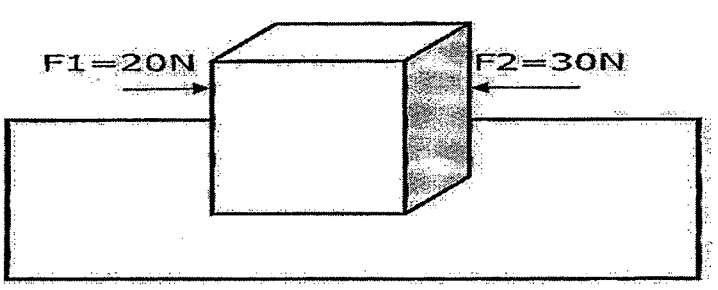
a) A suitcase is dropped from a certain height.

b) A bicycle is moving in a straight line with constant velocity.

c) In the game of tug of war, the two teams apply force but the rope doesn't move.

d) A ball rolling on the ground stops after sometime

34. Two forces F1=20N and F2=30N are acting on an object as shown in figure



(i) Find the net force acting on the object?

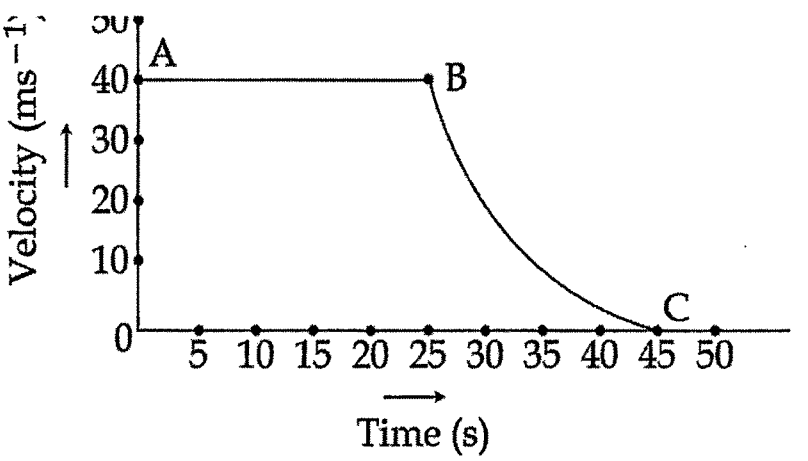
(ii) If the body still does not move under the application of these forces, what can be the possible reason for this? Identify the name of this extra force and its direction.

35. A large truck and a car both moving with a velocity of magnitude V have a head on collision and both come to a halt after that. If the collision last for 1 second then

a) Which vehicle experiences the greater change in momentum? Why?

b) Which vehicle experiences the greater force of impact? Why?

36. The velocity-time graph of an object is shown in the following figure :



a) Identify the part of graph where the object has zero acceleration. Give reason for your answer.

b) Identify the part of graph where the object has negative acceleration. Give reason for your answer.