Assignment - 3

Board Papers & Numericals

1. Sound
2. Calorimetry
3. Radioactivity

Submission Date : / /

Sound, Calorimetry, Radioactivity (Board papers)
Assignment Sheet

1. A tuning fork held over an air column of a given length, produces a distinct audible sound. What do you call this phenomenon ? How does it occur ? **[ICSE 2003]**

2. Sound made in front of a tall building 18m away, is repeated. Name the phenomenon and briefly explain it. **[ICSE 2003]**

3. A turning fork, held over an air column of a given length, produces a distinct audible sound. What do you call this phenomenon ? How does it occur ? **[ICSE 2003]**

4. Explain why steam pipes warm a building more effectively than hot water pipes in cold countries ? **[ICSE 2003]**

5. What is sonar ? State the principle on which it is based ? **[ICSE 2004]**

6. Differentiate between resonance and forced vibrations. **[ICSE 2004]**

7. What is the principle of calorimetry ? **[ICSE 2004]**

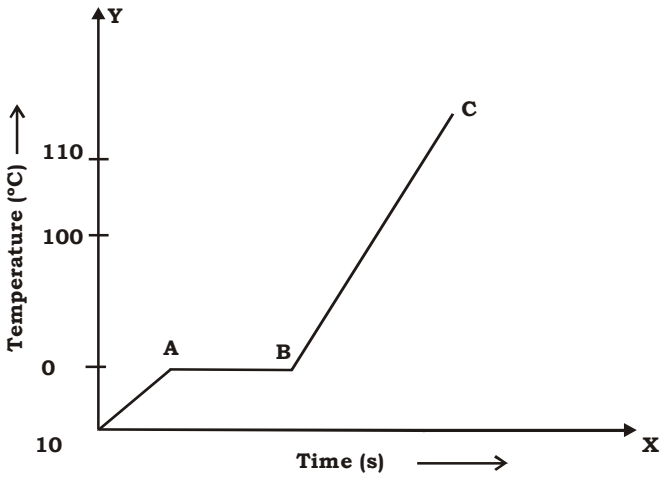
8. Amongst 1g of ice at 0°C and 1g of water at 0°C which contains more heat? Give a reason. **[ICSE 2004]**

9. Why does a wise farmer waters his fields, if forecast is frost ? **[ICSE 2004]**

10. State two ways by which the frequency of transverse vibration of a stretched string can be decreased. **[ICSE 2005]**

11. Why does the temperature of surroundings starts falling when the ice of a frozen lake starts melting ? **[ICSE 2005]**

12. A piece of ice is heated at constant rate. The variation of temperature with heat input is shown in the graph.
    (i) What is represented by AB ?
    (ii) What conclusions can you draw regarding the nature of ice from the graph ? **[ICSE 2005]**



13. Explain why musical instruments like the guitar are provided with a hollow box ? **[ICSE 2006]**

14. When a tuning fork, struck on a rubber pad, is held over a length of air column in a tube, it produces a loud sound for a fixed length of the air column.
    (i) Name the above phenomenon.
    (ii) How does the frequency of the loud sound compare with that of the tuning fork ?
    (iii) State the unit for measuring loudness. **[ICSE 2006]**

15. Give two reasons as to why copper is preferred over other metals for making calorimeters. **[ICSE 2006]**

16. Explain, why water is used in hot water bottles for formation and also as a universal coolant. **[ICSE 2006]**

17. Define the terms:
    (i) Amplitude
    (ii) Frequency (as applied to sound waves) **[ICSE 2007]**

18. (i) What is meant by specific heat capacity of a substance ?
    (ii) Why does the heat supplied to a substance during its change of state not cause any rise in its temperature ? **[ICSE 2007]**

19. The rear view mirror of motorbike starts vibrating violently at some particular speed of motorbike.
    (i) Why does this happen ?
    (ii) What is the name of the phenomenon taking place ?
    (iii) What could be done to stop the violent vibrations ? **[ICSE 2008]**

20. What is meant by an echo ? Mention one important condition that is necessary for an echo to be heard distinctly. **[ICSE 2008]**

21. Mention one important use of echo. **[ICSE 2008]**

22. A certain quantity of ice at 0°C is heated till it changes into steam at 100°C. Draw a time-temperature heating curve to represent it. Label the two phase change in your graph. **[ICSE 2008]**

23. (i) Define heat capacity of a given body. What is its S.I. unit ?
    (ii) What is the relation between heat capacity and specific heat capacity of a substance ? **[ICSE 2008]**

24. A stringed musical instrument, such as the Sitar is provided with a number of wires of different thickness. Explain the reason for this. **[ICSE 2009]**

25. What is meant by noise pollution ? Write the name of one source of sound that causes noise pollution. **[ICSE 2009]**

26. What is the principle on which SONAR is based ? **[ICSE 2009]**

27. (a) Name the characteristic of sound which enables a person to differentiate between two sounds with equal loudness but having different frequencies.
    (b) Define the charactieristic named by you in (a).
    (c) Name the characteristic of sound which enables a person to differentiate between two sounds of the same loudness and frequency but produced by different instrument. **[ICSE 2009]**

28. (a) A person is tuning his radio set to a particular station. What is the person trying to do to tune it ?
    (b) Name the phenomenon involved, in turning the radio set.
    (c) Define the phenomenon named by you in part (b). **[ICSE 2009]**

29. Why do pieces of ice added to a drink cool it much faster than ice cold water added to it ? **[ICSE 2009]**

30. State in brief, what do the following statements mean:
    (a) the heat capacity of a body is $50 J°C^{-1}$.
    (b) the specific latent heat of fusion of ice is 336000 Jkg^{-1}.
    (c) the specific heat capacity of copper is 0.4 $Jkg^{-1}\,°C^{-1}$. **[ICSE 2009]**

31. (a) What is the principle of method of mixtures ?
    (b) Name the law on which this principle is based. **[ICSE 2009]**

32. Name the subjective property
    (i) of sound related to its frequency.
    (ii) of light related to its wavelength. **[ICSE 2010]**

33. State two differences between light waves and sound waves. **[ICSE 2010]**

34. Two waves of the same pitch have their amplitudes in the ratio 2 : 3.
    (i) What will be the ratio of their loudness ?
    (ii) What will be the ratio of their frequencies ? **[ICSE 2010]**

35. (i) Define the term 'specific latent heat of fusion' of a substance.
    (ii) Name the liquid which has the highest specific heat capacity.
    (iii) Name two factors on which the heat absorbed or given out by a body depends. **[ICSE 2010]**

36. (i) An equal quantity of heat is supplied to two substances A and B. The substance A shows a greater rise in temperature. What can you say about the heat capacity of A as compared to that of B ?
    (ii) What energy change would you expect to take place in the molecules of a substance when it undergoes -
    1. a change in its temperature ?
    2. a change in its state without any change in the temperture ?
    [ICSE 2010]

37. (i) Which material is the calorimeter commonly made of ?
    (ii) Give one reason for using this material. **[ICSE 2010]**

38. When acoustic resonance takes place, a loud sound is heard. Why does this happen ? Explain. **[ICSE 2011]**

39. (i) Name the type of waves which are used for sound ranging
    (ii) Why are these waves mentioned in (i) above, not audible to us?
    (iii) Give one use of sound ranging. **[ICSE 2011]**

40. Differentiate between heat and temperature. **[ICSE 2011]**

41. Define Calorimetry. **[ICSE 2011]**

42. (i) Explain why the weather becomes very cold after a hail storm.
    (ii) What happens to the heat supplied to a substance when the heat supplied causes no change in the temperature of the substance?
    [ICSE 2011]

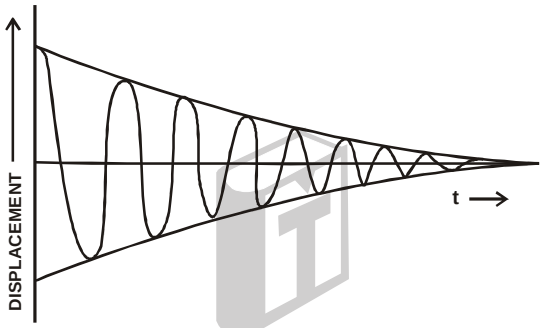
43. (i) When 1 g of ice at 0°C melts to form 1g of water at 0°C then, is the latent heat absorbed by the ice or given out by it?
    (ii) Give one example where high specific heat capacity of water is used as a heat reservoir.
    (iii) Give one example where high specific heat capacity of water is used for cooling purposes. **[ICSE 2011]**

44. Which characteristic of sound will change if there is a change in
    (i) its amplitude
    (ii) its waveform. **[ICSE 2012]**

45. (i) Name one factor which affects the frequency of sound emitted due to vibrations in an air column.
    (ii) Name the unit used for measuring the sound level. **[ICSE 2012]**

46. (i) What is meant by Resonance?
    (ii) State two ways in which Resonance differs from Forced vibrations. **[ICSE 2012]**

47. The diagram below shows the displacement-time graph for a vibrating body.
    (i) Name the type of vibrations produced by the vibrating body.
    (ii) Give one example of a body producing such vibrations.
    (iii) Why is the amplitude of the wave gradually decreasing?
    (iv) What will happen to the vibrations of the body after some time? **[ICSE 2012]**



48. Differentiate between heat capacity and specific heat capacity. **[ICSE 2012]**

49. A piece of ice at 0°C is heated at a constant rate and its temperature recorded at regular intervals till steam is formed at 100°C. Draw a temperature – time graph to represent the change in phase. Label the different parts of your graph. **[ICSE 2012]**

50. A bucket kept under a running tap is getting filled with water. A person sitting at a distance is able to get an idea when the bucket is about to be filled
    (i) What change takes place in the sound to give this idea
    (ii) What causes the change in sound. **[ICSE 2013]**

51. Define the term 'Heat capacity & state its S.I. unit.' **[ICSE 2013]**

52. What is meant by Global Warming. **[ICSE 2013]**

53. Which of the radioactive radiations : **[ICSE 2013]**
    (i) Cause severe genetical disorder
    (ii) Deflected by an electric field

54. What is the principle on which SONAR is based? **[ICSE 2013]**

55. A vibrating tuning fork is placed over the mouth of a burette filled with water. The tap of burrete is opened & water level gradually starts falling. It is found that sound from the tuning fork becomes very loud for a particular length of water column. **[ICSE 2013]**

    (i) Name the phenomenon taking place when this happens
    (ii) Why does the sound become very loud for this length of water column.

56. What is meant by the terms : **[ICSE 2013]**
    (i) Amplitude
    (ii) Frequency of a wave

57. Explain why stringed musical instruments like guitar, are provided with hollow box. **[ICSE 2013]**

58. It is observed that temperature of the surroundings start falling when ice in a frozen lake starts melting. Give a reason for the observation. **[ICSE 2013]**

59. How is heat capacity of the body related to its specfic heat capacity. **[ICSE 2013]**

60. Why does a bottle of soft drink cool faster when surrounded by ice cubes that by ice cold water, both at 0°C. **[ICSE 2013]**

61. Name 3 main parts of a Cathode Ray Tube. **[ICSE 2013]**

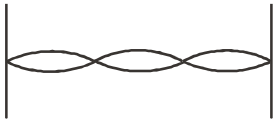
62. What is meant by Radioactivity. **[ICSE 2013]**

63. What is meant by Nuclear Waste. **[ICSE 2013]**

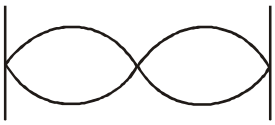
64. Suggest one effective way for safe disposal of nuclear waste. **[ICSE 2013]**

65. (i) What are mechanical waves?
    (ii) Name one property of waves that do not change when the wave passes from one medium to another. **[ICSE 2014]**

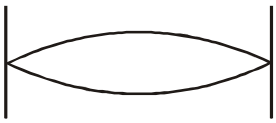
66. The adjacent diagram shows three different modes of vibrations P, Q and R of the same string.
    (i) Which vibrations will produce a louder sound and why?



(ii) The sound of which string will have maximum shrillness?



(iii) State the ratio of wavelengths of P and R. **[ICSE 2014]**



67. State one important property of waves used for echo depth sounding. **[ICSE 2014]**

68. Specific heat capacity of substance A is 3.8 J $g^{-1}K^{-1}$ whereas the Specific heat capacity of Substance B is 0.4 J g^{-1} K^{-1}.
    (i) Which of the two is a good conductor of heat?
    (ii) How is one led to the above conclusion?
    (iii) If substances A and B are liquids then which one would be more useful in car radiators? **[ICSE 2014]**

69. (i) State any two measures to minimize the impact of global warming.
    (ii) What is the Greenhouse effect? **[ICSE 2014]**

70. (i) Draw a graph between displacement and the time for a body executing free vibrations.
    (ii) Where can a body execute free vibrations? **[ICSE 2015]**

71. Rishi is surprised when he sees water boiling at 115° C in a container. Give reasons as to why water can boil at the above temperature. **[ICSE 2015]**

72. (i) State the safe limit of sound level in terms of decibel for human hearing.
    (ii) Name the characteristic of sound in relation to its waveform. **[ICSE 2015]**

73. (i) Name a gas caused by the Greenhouse effect.
    (ii) Which property of water makes it an effective coolant? **[ICSE 2015]**

74. (i) Water in lakes and ponds do not freeze at once in cold countries. Give a reason in support of your answer.
    (ii) What is the principle of Calorimetry?
    (iii) Name the law on which this principle is based.
    (iv) State the effect of an increase of impurities on the melting point of ice. **[ICSE 2015]**

75. What do you understand by the following statements:
    (i) The heat capacity of the body is $60JK^{-1}$.
    (ii) The specific heat capacity of lead is 130 $Jkg^{-1}K^{-1}$. **[ICSE 2016]**

76. State two factors upon which the heat absorbed by a body depends. **[ICSE 2016]**

77. The ratio of amplitude of two waves is 3 : 4. What is the ratio of their :
    (i) loudness ?
    (ii) frequencies ? **[ICSE 2016]**

78. State two ways by which the frequency of transverse vibrations of a stretched string can be increased. **[ICSE 2016]**

79. What is meant by noise pollution? Name one source of sound causing noise pollution. **[ICSE 2016]**

80. State the characteristics required of good thermion emitter. **[ICSE 2016]**

81. A radioactive substance is oxidized. Will there be any change in the nature its radioactivity? Give a reason for your answer. **[ICSE 2016]**

82. (i) What is the principle of method of mixtures?
    (ii) What is the other name given to it?
    (iii) Name the law on which the principle is based **[ICSE 2016]**

83. (i) Name the waves used for echo depth sounding.
    (ii) Give one reason for their use for the above purpose.
    (iii) Why are the waves mentioned by you not audible to us? **[ICSE 2016]**

84. (i) What is an echo?
    (ii) State two conditions for an echo to take place. **[ICSE 2016]**

85. (i) Name the phenomenon involved in tunning a radio set to a particular station.
    (ii) Define the phenomenon named by you in part (i) above.
    (iii) What do you understand by loudness of sound?
    (iv) In which unit is the loudness of sound measured? **[ICSE 2016]**

86. Arrange α, β, and γ rays in ascending order with respect to their
    (i) Penetrating power.
    (ii) Iionising power.
    (iii) Biological effect. **[ICSE 2016]**

87. (i) In a cathode ray tube what is the function of anode?
(ii) State the energy conversion taking place in a cathode ray tube.
(iii) Write one use of cathode ray tube. **[ICSE 2016]**

88. (i) Represent the change in the nucleus of a radioactive element when a β particle is emitted.
(ii) What is the name given to elements with same mass number and different atomic number?
(iii) Under which conditions does the nucleus of an atom tend to radioactive? **[ICSE 2016]**

89. Define heat capacity and state its SI unit. **[ICSE 2017]**

90. Why is the base of a cooking pan generally made thick? **[ICSE 2017]**

91. How is the transference of heat energy by radiation prevented in a calorimeter? **[ICSE 2017]**

92. Name two factors on which the heat energy liberated by a body depends. **[ICSE 2017]**

93. Answer the following questions based on a hot cathode ray tube.
(i) Name the charged particles.
(ii) State the approximate voltage used to heat the filament.
(iii) What will happen to the beam when it passes through the electric field? **[ICSE 2017]**

94. State three factors on which the rate of emission of electrons from a metal surface depends. **[ICSE 2017]**

95. (i) What are free electrons?
(ii) Why do they not leave the metal surface on their own?
(iii) How can they be made to leave the metal surface? (State any two ways) **[ICSE 2017]**

❖❖❖❖❖