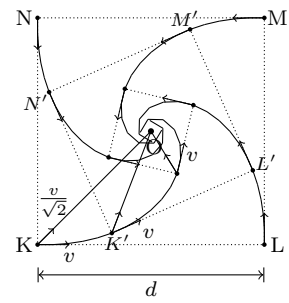
This errata sheet lists errors and their correction for the the book titled *IIT JEE Physics (1978-2015: 38 Years) Topic-wise Complete Solutions, Vol I: Mechanics, Waves and Optics*, First Edition, 2015 ⇝ 2., by Jitender Singh and Shraddhesh Chaturvedi.

▶ Page 21 Solution 16. Correct solution of this problem is:

16. The trajectory followed by the four persons is very interesting (see figure). Consider a small time interval Δt at the beginning of journey. In this time interval, all of them travel a distance $v\Delta t$ in the direction of person they are facing i.e., person K moves a distance $v\Delta t$ along the line KL, person L moves a distance $v\Delta t$ along the line LM and so on. In the next time interval, K starts moving in the direction of new position of L, L starts moving in the direction of new position of M and so on. Through this process, all persons finally meet at the centre of the square O. The symmetry plays a key role in this problem. Four persons always remain at the corners of a square. The sides of this square decrease and rotate continuously but its centre remains fixed at O.



Now, concentrate on the motion of K. The magnitude of its velocity is v and the direction of its velocity at any instant is along the side $K'L'$ of the square formed by the four persons at that instant (see figure). Thus, its velocity vector always makes 45° angle with the line joining current position of K and centre of the square O. Hence, the component of its velocity towards O is $v\cos 45° = v/\sqrt{2}$ (a constant). The net displacement of K from the initial position K to the final position O is vector $\vec{\mathrm{KO}}$ with magnitude $d/\sqrt{2}$. Thus, the time taken by K to reach O is the ratio of 'displacement' and 'component of velocity along displacement' i.e., $t = \frac{d/\sqrt{2}}{v/\sqrt{2}} = \frac{d}{v}$.

Aliter: The velocity of K is v along KL. The velocity of L is zero along KL (because it is perpendicular to the line KL). Thus, the separation KL decreases at a rate v. Since this rate is constant, the time taken to reduce the separation from d to zero is d/v.

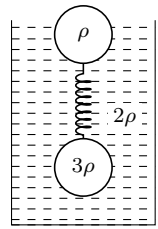
Credit: Halachandra Kalloli and Aryamaan Yadav (15-08-2016, c, mtb)

▶ Page 205 Solution 6 Equation 2. Replace $g = 4\pi^2 t^2/(ln^2)$ by $g = 4\pi^2 ln^2/t^2$.

Credit: Kshitiz Chaurasia (15-08-2016, t, xfa)

▶ Page 238 Solution 17. Complete solution of this problem is:

17. Let the height of the container is large enough. Consider the two spheres and the massless spring as a system. The external forces on this system are (i) Weight of the heavier sphere in downward direction (ii) Weight of lighter sphere in the downward direction, (iii) Upthrust of the liquid on both the spheres. Here, we have not considered the spring force as it is internal to the system.



The heavier sphere (density 3ρ) will move downwards pulling the lighter sphere (density ρ) along with it. Let volume V of the lighter sphere is submerged in liquid. In equilibrium, the net force on the system is zero i.e.,

$$\tfrac{4}{3}\pi R^3(3\rho)g + \tfrac{4}{3}\pi R^3(\rho g) = \tfrac{4}{3}\pi R^3(2\rho)g + V(2\rho)g. \quad (1)$$

Solve equation (1) to get $V = \frac{4}{3}\pi R^3$. Thus, lighter sphere will be completely inside the liquid in the equilibrium.

Let the elongation of the spring be x in the equilibrium condition. As the two sphere system is in equilibrium, two spheres are also in equilibrium separately. Newton's second law on both the spheres give

$$\tfrac{4}{3}\pi R^3(\rho)g + kx = \tfrac{4}{3}\pi R^3(2\rho)g \quad (2)$$

$$\tfrac{4}{3}\pi R^3(2\rho)g + kx = \tfrac{4}{3}\pi R^3(3\rho)g. \quad (3)$$

We get same equation for both the spheres. Solve to get $x = 4\pi R^3\rho g/(3k)$.
Credit: Prasad Patankar (15-08-2016, c, mvb)

► Page 277 Solution 1 Paragraph starting with "Solutions of equation. . . ". Replace $(4\pi x - 0.4t)$ by $(4\pi x - 0.4\pi t)$ at all the three places in this paragraph.
Credit: Prasad Patankar (15-08-2016, t, qga)

► Page 298 Paragraph for Question 31-33 second last line". Replace "is thus 340 Hz" by "is thus 320 Hz".
Credit: Prasad Patankar (15-08-2016, t, lia)

► Page 387 Solution 33. Replace $1/f = 3/200\ \text{cm}^{-1} = 3/2\ \text{m}^{-1}$ by $1/f = -3/200\ \text{cm}^{-1} = -3/2\ \text{m}^{-1}$. Also replace "diaopter" by "diopters".
Credit: Prannoy Mehta (15-08-2016, t, nta)

► Page 429 Appendix A. Replace "permitivity" by "permittivity" and "Mass of the electrom" by "Mass of the electron". (15-08-2016, t, appendix)

This errata sheet lists errors and their correction for the the book titled *IIT JEE Physics (1978-2015: 38 Years) Topic-wise Complete Solutions, Vol 2: Heat, Electromagnetism and Modern Physics*, First Edition, 2015 ⇝ 2., by Jitender Singh and Shraddhesh Chaturvedi.

▶ Page 15 Solution 22 Paragraph starting with "In fundamental mode...". Replace "$\mu = m/l = 0.5/1 = 0.5$ kg/m" by "$\mu = m/l = 0.1/1 = 0.1$ kg/m".
Credit: Divyanshu Tiwari (15-08-2016, t, uza)

▶ Page 24 Solution 12 Paragraph starting with "The specific heats at constant pressure...". Replace

$$C_{p,\text{He}} = C_{v,\text{He}} + R = \tfrac{5}{2}RT, \quad \text{and} \quad C_{p,\text{mix}} = C_{v,\text{mix}} + R = 3RT.$$

by

$$C_{p,\text{He}} = C_{v,\text{He}} + R = \tfrac{5}{2}R, \quad \text{and} \quad C_{p,\text{mix}} = C_{v,\text{mix}} + R = 3R.$$

Credit: Divyanshu Tiwari (15-08-2016, t, hyb)

▶ Page 29 Question 1. Replace 4.2 kJ/kg by 4.2 kJ/(kg°C). (15-08-2016, t, xpa)

▶ Page 34 Solution 9. Point (2) Replace "Liquid state **releasing** energy" by "Liquid state **absorbing** energy".
Credit: Divyanshu Tiwari (31-08-2016, t, oqa)

▶ Page 36 Solution 12. Replace second line of the Q_r equation

$$= -(0.1)(100)(300 - 500) - \frac{1}{2}(0.1)(2 \times 10^{-2})(300^2 - 500^2)$$

by

$$= -(m)(100)(300 - 500) - \frac{1}{2}(m)(2 \times 10^{-2})(300^2 - 500^2)$$

Credit: Divyanshu Tiwari (31-08-2016, t, msa)

▶ Page 37 Solution 14. Replace m_s by m at all four places. Replace "Then, mass m_s of water at" by "'Then, mass m of transformed water at"
Credit: Divyanshu Tiwari (31-08-2016, t, dsa)

▶ Page 39 Problem 1. In first line, replace "process **of** an ideal gas" by "process **on** an ideal gas"
Credit: Divyanshu Tiwari (31-08-2016, t, kpa)

▶ Page 42 Problem 12. Replace "process starting **form** A." by "process starting **from** A."

Credit: Divyanshu Tiwari (31-08-2016, t, esa)

▶ Page 53 Problem 17. Replace "(A) $C_p - C_c$ is larger" by "(A) $C_p - C_v$ is larger"

Credit: Divyanshu Tiwari (31-08-2016, t, yea)

▶ Page 70 Solution 26. Replace "then the **potential** energy of the gas" by "then the **internal** energy of the gas A."

Credit: Divyanshu Tiwari (31-08-2016, t, mba)

▶ Page 71 Solution 28. Replace "specific heat **a** constant volume" by "specific heat **at** constant volume A."

Credit: Divyanshu Tiwari (31-08-2016, t, gra)

▶ Page 117 Answer 46. Replace "(a) $4a/3a$" by "(a) $4a/3$"

Credit: Divyanshu Tiwari (31-08-2016, t, jfb)

▶ Page 117 Answer 48. Replace "(b) $-\frac{3}{5}\frac{GM^2}{R}$" by "(b) $\frac{3}{5}\frac{GM^2}{R}$"

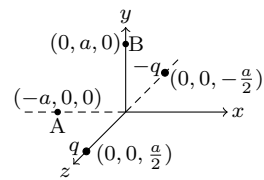
Credit: Divyanshu Tiwari (31-08-2016, t, bfb)

▶ Page 117 Answer 57. Replace "(b) $q_1q_2 = 4\pi\epsilon_0 mgl^2$" by "(b) $q_1q_2 = -4\pi\epsilon_0 mgl^2$"

Credit: Divyanshu Tiwari (31-08-2016, t, reb)

▶ Page 118 Solution 4. Replace the solution by

4. The charge configuration is shown in the figure. The point $A(-a, 0, 0)$ is at a distance $r_A = \sqrt{5}a/2$ from both the charges. Also, the point $B(-a, 0, 0)$ is at a distance $r_B = \sqrt{5}a/2$ from both the charges. The potentials at the point A and B are given by



$$V_A = \frac{1}{4\pi\epsilon_0}\frac{q}{r_A} - \frac{1}{4\pi\epsilon_0}\frac{q}{r_A} = 0,$$
$$V_B = \frac{1}{4\pi\epsilon_0}\frac{q}{r_B} - \frac{1}{4\pi\epsilon_0}\frac{q}{r_B} = 0.$$

Since $V_A = V_B$, the work done in taking a unit charge from A to B is zero. The electrostatic forces are conservative and work done by them do not depend on the path. The readers are encouraged to show that work done in taking a unit charge from A to B is zero even if both the charges are positive.

Credit: Divyanshu Tiwari (31-08-2016, t, eia)

▶ Page 121 Solution 18. Replace the equation

$$F_{\text{net}} = 2F\cos\theta = \frac{2Qqx}{4\pi\epsilon_0(x^2+a^2)^3/2}.$$

by

$$F_{\text{net}} = 2F\cos\theta = \frac{2Qqx}{4\pi\epsilon_0(x^2+a^2)^{3/2}}.$$

Credit: Divyanshu Tiwari (31-08-2016, t, wcb)

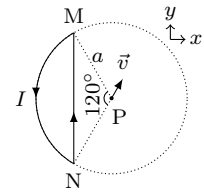
▶ Page 148 Solution 14. Replace "shell of same **sadius** and charge." by "shell of same **radius** and charge."
Credit: Divyanshu Tiwari (31-08-2016, t, ycb)

▶ Page 150 Solution 18. Replace "position vector **from** of P" by "position vector of P"
Credit: Divyanshu Tiwari (31-08-2016, t, wvb)

▶ Page 160 Problem 12. Replace "the plate **are** covered by the dielectric" by "the plate **area** covered by the dielectric"
Credit: Divyanshu Tiwari (31-08-2016, t, rwb)

▶ Page 223 Problem 42. Show radius of the circle a as shown in figure:

Credit: Divyanshu Tiwari (31-08-2016, t, nhb)



▶ Page 292 Solution 19. Replace $\int \vec{E}\cdot\mathrm{d}\vec{s} = 4\pi GM_{\text{enc}}$ by $\int \vec{E}\cdot\mathrm{d}\vec{s} = -4\pi GM_{\text{enc}}$.
Credit: Tribhuvan Narayan Soorya (15-08-2016, t, uib)

▶ Page 333 Solution 9. In first figure, replace "$-\phi$" by "$-\frac{\phi}{e}$" (intercept on V_0 axis). (31-08-2016, t, jyb)

▶ Page 429 Appendix A. Replace "Mass of the electrom" by "Mass of the electron". (15-08-2016, t, appendix)