| BCM SCHOOL, BASANT AVENUE, DUGRI, LUDHIANA.<br>OCTOBER ASSIGNEMENT- ANSWER KEY<br>CLASS- X (MATHEMATICS)<br>TOPICS: TRIANGLES & SURFACE AREA AND VOLUME. | |
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| **SECTION –A (MULTIPLE CHOICE QUESTIONS)** | |
| 1. | (d) ΔABC ~ ΔDFE |
| 2. | (b) ∠ B= ∠D |
| 3. | (c) $4\pi rh + 2\pi r^2$ |
| **SECTION B( 2 MARKS QUESTIONS)** | |
| 4. | Here AD = 6x − 7, DB = 4x − 3,<br>AE = 3x − 3, EC = 2x − 1<br>∵ DE ∥ BC<br>By BPT $\frac{\mathbf{AD}}{\mathbf{DB}} = \frac{\mathbf{AE}}{\mathbf{EC}}$<br>$\frac{6x-7}{4x-3} = \frac{3x-3}{2x-1}$<br>On solving we get x = 2. |
| 5. | Radius of cone = edge of cube/2=14/2 cm = 7 cm<br>Height of cone = edge of cube = 14 cm.<br>L = $7\sqrt{5}cm$<br>Surface area of remaining solid = S.A. of cube – S.A. of circular base of cone + Lateral S.A. of cone = $6a^2 - \pi r^2 + \pi rl$<br>Answer =$(1022 + 154\sqrt{5})$ $cm^2$ |
| **SECTION – C (3 MARKS QUESTIONS)** | |
| 6. | 3/4 × Vol. of conical vessel = Vol. of cylindrical vessel<br>H = 1.5 cm |
| 7. | $Pa \perp AC$ and $QB \perp AC \Rightarrow QB \mid \mid PA$.<br>Thus, in $\Delta PAC, QB \mid \mid PA$, So, $\Delta QBC$~$\Delta PAC$.<br>$\therefore \frac{QB}{PA} = \frac{BC}{AC} \Rightarrow \frac{z}{x} = \frac{b}{a+b}$.... $(i)$ [ bu the propery of similar Δ ]<br>In $\Delta RAC, QB \mid \mid RC$, So, $\Delta QBA$~$\Delta RAC$.<br>$\therefore \frac{QB}{RC} = \frac{AB}{AC} \Rightarrow \frac{z}{y} = \frac{a}{a+b}$...$(ii)$ [ by the propert of similar Δ]<br>From (i) and (ii), we get<br>$\frac{z}{x} + \frac{z}{y} = \left(\frac{b}{a+b} + \frac{a}{a+b}\right) = 1$<br>$\Rightarrow \frac{z}{x} + \frac{z}{y} = 1 \Rightarrow \frac{1}{x} + \frac{1}{x} + \frac{1}{y} = \frac{1}{z}$<br>Hence, $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$ |
| **SECTION – D (5 MARKS QUESTIONS)** | |

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| 8. | $\Delta$DEM and $\Delta$CBM are congruent<br>By CPCT, DE = BC<br>but AE = AD + DE<br>= AD + BC<br>$\Rightarrow$ AE = 2BC<br>Now, $\Delta$AEL ~ $\Delta$CBL [By AA similarity]<br>$\frac{AE}{BC} = \frac{EL}{BL}$<br>$\frac{2BC}{BC} = \frac{EL}{BL}$<br>$EL = 2\,BL$ |
| 9. | Volume of liquid in vessel = Volume of liquid in cone + Volume of liquid in cylinder to a height of 3 cm , on solving answer = 924 $cm^3$<br>On turning upside down this 924 cm3 of liquid is poured in cylinder.<br>Let 'H' cm be the height to which liquid reaches in cylindrical vessel.<br>$\Rightarrow$ Volume of liquid column of height 'H' cm in cylinder = 924 $cm^3$<br>$\Rightarrow \pi \times (7)^2 \times H = 924$<br>H = 6 cm |
| **SECTION – E (CASE STUDY)** | |
| 10. | a)<br>Total surface area of boiler<br>= SA of cylindrical part + SA of two hemisphere<br>$= 6\pi r^2 + 2\left(\frac{4\pi r^2}{2}\right) = 6\pi r^2 + 4\pi r^2 = 10\pi r^2$<br>b)<br>Volume of boiler,<br>= Volume of cylinder+ Volume of two hemisphere<br>$= \pi r^2 l + 2\left(\frac{2\pi}{3} \times r^3\right) = \pi r^2 \cdot 3r + \frac{4\pi}{3} \times r^3 = \left(3 + \frac{4}{3}\right)\pi r^3 = \frac{13}{3}\pi r^3$<br>c)<br>Ratio of volume to the surface$= \frac{\frac{13}{3}\pi r^3}{10\pi r^2} = \frac{13}{30} r$ |