Soln 1) (a) $\boxed{uvu}$ is a closed walk but not a closed trail as edge uv is repeated.

(b) $uvwxxu$ is a closed trail but not a cycle as vertex 'x' appears more than once.

(c) cycle of length 1 : xx
cycle of length 2 : xwx
cycle of length 3 : $uvwu$ and $uwxu$ and $uwxu$
cycle of length 4 : $uvwxu$
and
$uvwxu$

A-2) By Theorem of r-regular graph, we know that no. of edges $= \frac{nr}{2}$ —(1)

As in question, n & r both are odd
$\therefore$ nr will be odd ($\because$ product of 2 odd nos is odd)

$\therefore$ (1) $\Rightarrow$ $\frac{nr}{2}$ will not be a whole number.

Hence, there can be no r-regular graphs having n vertices where n & r are odd.

Q-3) Vertices $(n) = 8$ (given)
Edges $= 12$

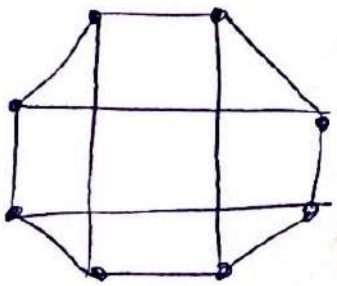
We know that a r-regular graph with n vertices has $\frac{nr}{2}$ edges

$\therefore \frac{nr}{2} = 12$

i.e. $\frac{8 \times r}{2} = 12$

i.e. $r = \frac{24}{8} = \boxed{3}$

$\therefore$ graph will be 3-regular i.e.



or

Q-4) G_1 ✓

G_2 ✓

G_3 ✗