G. H. Raisoni College of Engineering, Nagpur
(An Autonomous Institution)
2020-2021 ODD TERM
CAE-2 EXAMINATION FOR SPLIT-II COURSES WINTER-2020 (ONLINE MODE)
Third Semester B.Tech. Artificial Intelligence
Discrete Mathematics

Time: 1 hr.]   **[Max. Marks : 15**

1) [CO1/CO2/CO…] indicates the question related to specific course outcome.
2) All questions carry marks as indicated
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.
5) Illustrate your answer wherever necessary with the help of neat sketches.
6) Use of non-programmable calculator is permitted.

CO.2   (1) Let (G,*) be a group and $a, b \in G$. Suppose that $a * b = b * a^{-1}$ and $b * a = a * b^{-1}$, then show that O(a)=O(b)=4   **[5M]**

CO.2   (2) Prove that the set of all matrices of the form $\begin{bmatrix} a & b \\ 0 & c \end{bmatrix}$, $ac \neq 0$, $a, b, c \in Q$ with respect to

      multiplication is a non commutative group.   **[5M]**

CO2   (3) In a group (G,*) prove that

      (i) The inverse of the inverse of an element is equal to the element.
      (ii) The inverse of the product of two elements is the product of the inverse in reverse
      order.   **[5M]**