Roll No. 16823010 3

Total No. of Questions : 6] [Total No. of Printed Pages : 3

B.E. IInd Semester (CGPA) Examination, 2017

EF–237

CSE

(Discrete Structure)

Paper : CS-205

Time : 3 Hours] **[Maximum Marks : 60**

Note :– Attempt all *six* questions. All questions carry equal marks. Symbols have their usual meanings.

1. Write short notes on the following :
   (a) Explain Power set and Proper subset.
   (b) What is Equivalence Relation ?
   (c) Explain Group and Semigroup.
   (d) Explain Finite and Infinite Sets.
   (e) Explain Path, Walk and Circuit.

2. If $f : R \to R$, defined by $f(x) = x^2 \ \forall \ x \in R$ and $g : R \to R$, defined by $g(x) = \sin x \ \forall \ x \in R$. Then find $g \circ f$ and $f \circ g$ also show that $(g \circ f)\, x \neq (f \circ g)x$.

Or

Show that :

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

3. Is the following formula a tautology ?

$$(p \to q) \wedge (q \to r) \to (p \to r)$$

Or

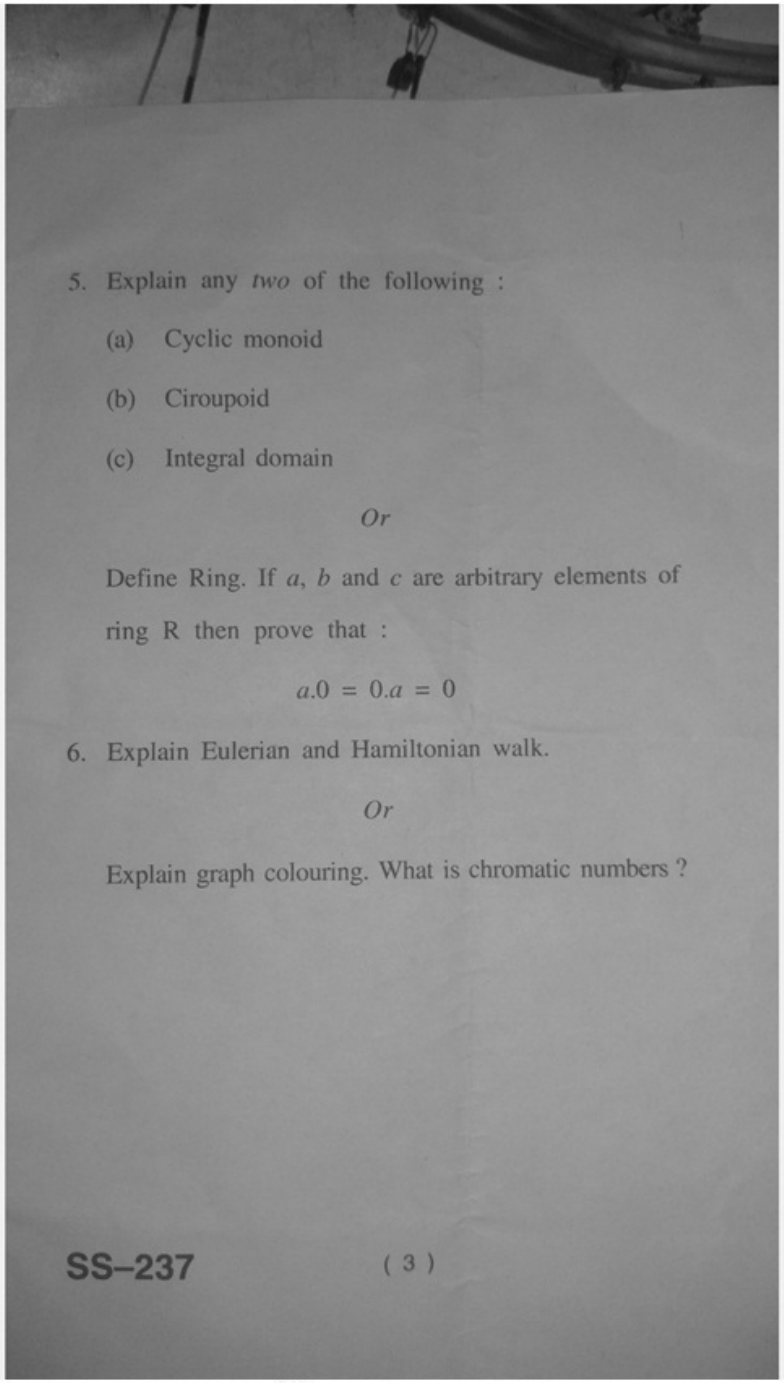
Is the following formula a tautology ?

$$p \to [p \wedge (q \to p)]$$

4. What are distributive and complemented lattices ? Explain with example.

Or

Explain partial ordering set with example. Also explain morphism.



5. Explain any *two* of the following :

   (a) Cyclic monoid

   (b) Ciroupoid

   (c) Integral domain

Or

Define Ring. If a, b and c are arbitrary elements of ring R then prove that :

$$a.0 = 0.a = 0$$

6. Explain Eulerian and Hamiltonian walk.

Or

Explain graph colouring. What is chromatic numbers ?