Course No: SWE 2303
Course Title: Discrete Math.
Date: 23/05/2015
No. of Questions: (05)
Time: 2 H.
Using Calculator (YES)

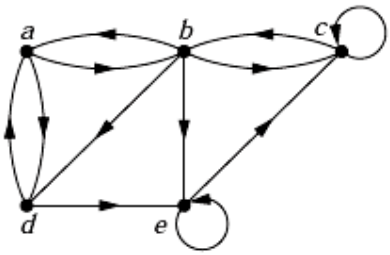
University of Palestine

Final Exam
2014/2015
Total Grade: 60 Marks

Instructor Name: Dr. Ibrahim Tabash
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary (No)

Q1

A) Use an adjacency list to represent the given graph.



B) Represent the compound propositions $\neg(p \wedge q) \leftrightarrow (\neg p \vee \neg q)$ using ordered rooted tree.

Write this expression in

a. Prefix notation
b. Postfix notation

Course No: SWE 2303
Course Title: Discrete Math.
Date: 23/05/2015
No. of Questions: (05)
Time: 2 H.
Using Calculator (YES)

University of Palestine

Final Exam
2014/2015
Total Grade: 60 Marks

Instructor Name: Dr. Ibrahim Tabash
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary (No)

Q2

A) What is the value of this prefix expression

$$+-\uparrow 32 \uparrow 23/6 \ -42$$

B) What is the value of this postfix expression

$$521--314++*$$

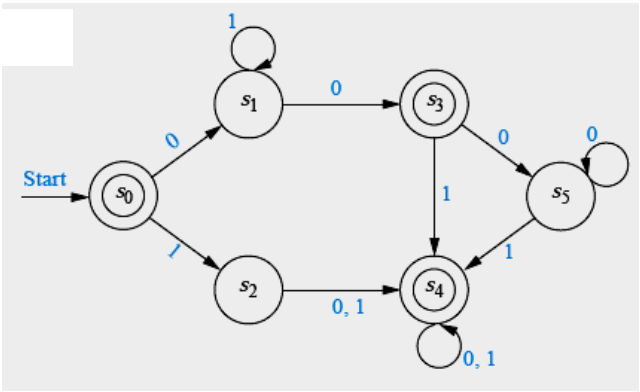
C) Draw the state diagram for the finite-state machine with this state table.

State	f Input 0	f Input 1	g Input 0	g Input 1
s_0	s_1	s_0	0	0
s_1	s_2	s_0	1	1
s_2	s_0	s_3	0	1
s_3	s_1	s_2	1	0

Course No: SWE 2303 **Course Title: Discrete Math.** **Date: 23/05/2015** **No. of Questions: (05)** **Time: 2 H.** **Using Calculator (YES)**	**University of Palestine** **Final Exam** **2014/2015** **Total Grade: 60 Marks**	**Instructor Name: Dr. Ibrahim Tabash** **Student No.: _____** **Student Name: _____** **College Name: _____** **Dep. / Specialist: _____** **Using Dictionary (No)**

Q3

A) Find the language recognized by the given deterministic finite-state automaton.



B) Construct a deterministic finite-state automaton that recognizes the set of all bit strings that contain an even number of 0s and an odd number of 1s

Course No: SWE 2303
Course Title: Discrete Math.
Date: 23/05/2015
No. of Questions: (05)
Time: 2 H.
Using Calculator (YES)

University of Palestine

Final Exam
2014/2015
Total Grade: 60 Marks

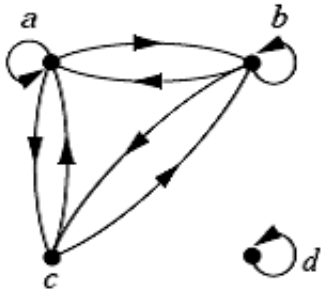
Instructor Name: Dr. Ibrahim Tabash
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary (No)

Q4

A) Let $R_1 = \{(1,2),(2,3),(3,4)\}$ and R_2={(1, 1), (1, 2), (2,1), (2, 2), (2, 3), (3,1), (3, 2), (3, 3), (3, 4)} be relations from {1, 2, 3} to {1, 2, 3, 4}. Find

a. $R_1 \cup R_2$
b. $R_1 \cap R_2$
c. $R_1 - R_2$
d. $R_2 - R_1$
e. $R_1 \circ R_2$

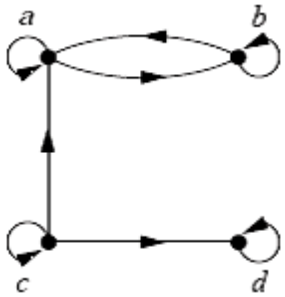
B) List the ordered pairs in the relations represented by the directed graph



Course No: SWE 2303 **Course Title: Discrete Math.** **Date: 23/05/2015** **No. of Questions: (05)** **Time: 2 H.** **Using Calculator (YES)**	**University of Palestine** **Final Exam** **2014/2015** **Total Grade: 60 Marks**	**Instructor Name: Dr. Ibrahim Tabash** **Student No.: _____** **Student Name: _____** **College Name: _____** **Dep. / Specialist: _____** **Using Dictionary (No)**

Q5

A) Determine whether the relation represented by the directed graph is reflexive, symmetric, anti-symmetric and/or transitive.



B) Determine whether the relation R on the set of all integers is reflexive, symmetric, anti-symmetric, and/or transitive, where $(x, y) \in R$ if and only if:

a. $x \equiv y \ (mod\ 7)$
b. $x \geq y^2$