

**Department of Computer Science & IT**  
**The Islamia University of Bahawalpur**

Date: Saturday, 21 Jan. 2017

MSCS (1<sup>st</sup> – Fall 2016-18) – Final-term

Subject: Software Engineering and Formal Specification

Course Instructor: Dr. Nadeem Akhtar

Time: 1 hour 45 mins

CSIT-31012

Total: 50 Marks

**Q. no. 1.**

**Short Questions.**

- (a) Describe *Temporal Logic*. Give one example.
- (b) Define *Formal Verification of Parallel Systems*.
- (c) Briefly differentiate between *Safety and Liveness*. Give examples.
- (d) Write the *Benefits and Limitations* of Model-Checking
- (e) Define briefly the following terms:
  - 1) *Predicate*
  - 2) *Pre-condition*
  - 3) *Post-condition*.
  - 4) *Invariant*
  - 5) *Proof Rule with 3 examples*

( 5 + 5 + 5 + 5 + 10 = 30 )

**Q. no. 2.**

Differentiate between *Theorem Proving and Model Checking*.

(10)

**Q. no. 3.**

**Finite State Processes (FSP)**

**What is action relabeling?**

**Show action relabeling by specifying a client server system having the following actions and processes:**

Actions = { call, wait, continue, request, service, reply }

Processes = { CLIENT, SERVER, CLIENT\_SERVER }

(10)