UG Exam Performance Feedback
Second Year
2016/2017 Semester 1

Q.1
1.a.1-1.a.3 solved by most students.
1.a.4 Many students struggled with optimised definitional clausal normal transformation. Typical errors:
   1. failed to include the name for the formula itself "n1" to the set of clauses (without this resulting CNF will be always satisfiable).
   2. did not use optimised transformation (where only one side of the bi-implication "<->" in definitions is used based on the polarity of the corresponding subformula occurrence).
   3. errors in applying standard CNF transformation to the definitions
1.b Many students failed to express validity/equivalence using satisfiability.
1.c a number of students solved this problem correctly, some presented over-complicated solutions; some failed to explain the answer.

Q.2
a) Pure literals: Many students correctly solved this problem. A number of students wrongly removed pure literals from clauses rather than clauses containing pure literals.
b) WAST was solved by most students correctly. Some did not calculate the probabilities correctly: failed to take into account that p_2 occurs in two clauses but p1, p3 occur in one clause each.
c) Semantic tableaux: Many students solved correctly; some did not use A=0 for checking validity and incorrectly used A=1; some applied tableaux rules incorrectly.

Q3.
a) OBDD, typical errors:
   1. mistakes during formula simplification;
   2. failed to integrate nodes, so OBDD would incorrectly contain isomorphic subdags.
b) Horn clauses, typical errors:
   1. wrong definition of Horn clauses
   2. over-complected solutions without clear explanations
c) QBF, typical errors:
   1. not using unit propagation and applying unnecessary splitting
   2. wrong variable order during splitting
   3. not using and/or nodes for forall/exists quantifiers
d) Many failed to symbolically represent reachability.

Q4.
a) most answered correctly
b) mistakes in applying the quantification algorithm;
c),d) most answered correctly

Comments
21111 Logic and Modelling
Konstantin Korovin

09 March 2017