5. \(P(x)\) : “\(x\) spends more than five hours every weekday in class.” where \(x\) is a student.
a) \(\exists x\ P(x)\) : There is a student who spends more than five hours every weekday in class.
b) \(\forall x\ P(x)\) : Every student spends more than five hours every weekday in class.
c) \(\exists x\ \neg P(x)\) : There is a student who does not spend more than five hours every weekday in class.
d) \(\forall x\ \neg P(x)\) : No student spends more than five hours every weekday in class.

7. \(C(x)\) : “\(x\) is a comedian.” \(F(x)\) : “\(x\) is funny.” where \(x\) is a person.
a) \(\forall x\ (C(x) \rightarrow F(x))\) : All comedians are funny.
b) \(\forall x\ (C(x) \land F(x))\) : Every person is a funny comedian.
c) \(\exists x\ (C(x) \rightarrow F(x))\) : There is a person who is funny if that person is a comedian.
d) \(\exists x\ (C(x) \land F(x))\) : There is a funny comedian.

9. \(P(x)\) : “\(x\) can speak Russian.” \(Q(x)\) : “\(x\) knows C++” where \(x\) is a student at OCC.
a) There is a student at OCC who can speak Russian and who knows C++.
   \(\exists x\ (P(x) \land Q(x))\)
b) There is a student at OCC who can speak Russian but who doesn’t know C++.
   \(\exists x\ (P(x) \land \neg Q(x))\)
c) Every student at OCC either can speak Russian or knows C++.
   \(\forall x\ (P(x) \lor Q(x))\)
d) No student at OCC can speak Russian or knows C++.
   \(\neg \exists x\ (P(x) \lor Q(x))\) or \(\forall x\neg (P(x) \lor Q(x))\)

17. If \(P(x)\) is defined for \(x\) in \{0, 1, 2, 3, 4\} express with disjunctions, conjunctions, negations.
a) \(\exists x\ P(x)\) : \(P(0) \lor P(1) \lor P(2) \lor P(3) \lor P(4)\)
b) \(\forall x\ P(x)\) : \(P(0) \land P(1) \land P(2) \land P(3) \land P(4)\)
c) \(\exists x\ \neg P(x)\) : \(\neg P(0) \lor \neg P(1) \lor \neg P(2) \lor \neg P(3) \lor \neg P(4)\)

21. If \(x\) is a student in this class or \(y\) is any person and \(C(y)\) : \(y\) is in this class.
a) Someone in this class can speak Hindi. \(H(x)\) : “\(x\) speaks Hindi.”
   \(\exists x\ H(x)\) or \(\exists y\ (C(y) \land H(y))\)
b) Everyone in this class is friendly. \(F(x)\) : “\(x\) is friendly.”
   \(\forall x\ F(x)\) or \(\forall y\ (C(y) \rightarrow F(y))\)