1. Let p: It rains

   q: the crops will grow. The converse of "If it rains then the crops will grow" is

   A. If the crops grow, then there has been rain

   B. If the crops do not grow then it will not rain

   C. If it does not rain then the crops will not grow

   D. The crops will grow if and only if it rains

   ANSWER: A

2. $p \leftrightarrow q$ is logically equivalent to

   A. $(p \rightarrow q) \vee (q \rightarrow p)$

   B. $(p \rightarrow q) \wedge (q \rightarrow p)$

   C. $p \rightarrow q$

   D. $q \rightarrow p$

   ANSWER: B

3. The proposition $p \wedge (q \wedge \neg p)$ is a

   A. tautology

   B. tautological implication

   C. contradiction

   D. biconditional statement

   ANSWER: C

4. For every positive integer $n, n^3 + n$ is

   A. a prime number

   B. odd number

   C. neither odd nor even number

   D. even number

   ANSWER: D

5. $((p \vee q) \wedge (p \to r) \wedge (q \to r)) \to r$ is a

   A. tautology

   B. contradiction

   C. universal quantifier

   D. existential quantifier

   ANSWER: A

6. The proposition $p \to (q \to r) \equiv$

   A. $p \wedge q$

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

   C. r

   D. T

   ANSWER: B

7. The conclusion from the set of premises $p \to q, q \to r$ and p is

   A. p

   B. q

   C. r

   D. $p \wedge q$

   ANSWER: C

8. The set of premises $a \to (b \to c), d \to (b \wedge \neg c)$ and $a \wedge d$ are

   A. homogeneous

   B. dependable

   C. consistent

   D. inconsistent

   ANSWER: D

9. The symbolic form of the statement " All men are mortal " is

   A. $\forall x(M(x) \to H(x))$

   B. $\exists x(M(x) \to H(x))$

   C. $\forall x(M(x) \wedge H(x))$

   D. $\exists x(M(x) \vee H(x))$

   ANSWER: A

10. The negation of the statement “Some students live in hostel” is

    A. some students do not live in hostel

    B. all students do not live in hostel

    C. all students live in hostel

    D. some students may or may not live in hostel

    ANSWER: B

11. Symbolize the following premise “A student in this class has not read discrete mathematics text book”

    A. $\forall x(C(x) \vee \neg D(x))$

    B. $\forall x(C(x) \wedge \neg D(x))$

    C. $\exists x(C(x) \wedge \neg D(x))$

    D. $\exists x(C(x) \vee \neg D(x))$

    ANSWER: C

12. For all $n \geq 1, n^5 - n$ is divisible by

    A. 11

    B. 7

    C. 23

    D. 5

    ANSWER: D