

Mathematical Reasoning

Q1. Which of the following sentences are statements? Justify.

(i) A triangle has three sides.

(ii) 0 is a complex number.

(iii) Sky is red,

(iv) Every set is an infinite set.

(v) $15 + 8 > 23$

(vi) $y + 9 = 7$

(vii) Where is your bag?

(viii) Every square is a rectangle.

(ix) Sum of opposite angles of a cyclic quadrilateral is 1800.

(x) $\sin^2 x + \cos^2 x = 0$

Sol: As we know, a statement is a sentence which is either true or false but not both simultaneously.

(i) It is true statement.

(ii) It is true statement.

(iii) It is false statement.

(iv) It is false statement.

(v) It is false statement.

(vi) $y + 9 = 7$

It is not considered as a statement, since the value of y is not given.

(vii) It is a question, so it is not a statement.

(viii) It is a true statement.

(ix) It is a true statement.

(x) It is a false statement.

Q2. Find the component statements of the following compound statements.

(i) Number 7 is prime and odd.

(ii) Chennai is in India and is the capital of Tamil Nadu.

(iii) The number 100 is divisible by 3, 11 and 5.

(iv) Chandigarh is the capital of Haryana and U.P.

(v) $\sqrt{7}$ is a rational number or an irrational number.

(vi) 0 is less than every positive integer and every negative integer.

(vii) Plants use sunlight, water and carbon dioxide for photosynthesis.

(viii) Two lines in a plane either intersect at one point or they are parallel.

(ix) A rectangle is a quadrilateral or a 5-sided polygon.

Sol: (i) p: Number 7 is prime.

q: Number 7 is odd.

(ii) P: Chennai is in India.

q: Chennai is capital of Tamil Nadu.

(iii) p. 100 is divisible by 3.

q: 100 is divisible by 11.

r: 100 is divisible by 5.

(iv) p. Chandigarh is capital of Haryana.

q: Chandigarh is capital of UP

(v) p: $\sqrt{7}$ is a rational number.

q: $\sqrt{7}$ is an irrational number.

(vi) p: 0 is less than every positive integer.

q: 0 is less than every negative integer.

(vii) p: Plants use sunlight for photosynthesis.

q: Plants use water for photosynthesis.

q:- Plants use carbon dioxide for photosynthesis.

(viii) p: Two lines in a plane intersect at one point.

q: Two lines in a plane are parallel.

(ix) p: A rectangle is a quadrilateral.

q. A rectangle is a 5-sided polygon.

Q3. Write the component statements of the following compound statements and check whether the compound statement is true or false.

(i) 57 is divisible by 2 or 3.

(ii) 24 is a multiple of 4 and 6.

(iii) All living things have two eyes and two legs.

(iv) 2 is an even number and a prime number.

Sol: (i) Here component statements are:

p: 57 is divisible by 2. [false]

q: 57 is divisible by 3. [true]

Given compound statement is of the form 'p \vee q'.

Since, the statement 'p \vee q' has the truth value T whenever either p or q or both have the truth value T.

So, it is true statement as 57 is divisible by 3.

(ii) Here component statements are: p: 24 is multiple of 4. q: 24 is multiple of 6.

Given compound statement is of the form 'p \wedge q'

Since, the statement 'p \wedge q' has the truth value T whenever both p and q have the truth value T.

So, it is a true statement as 24 is divisible by 4 and 6.

(iii) Here component statements are:

p: All living things have two eyes. [false]

q: All living things have two legs. [false]

Given compound statement is of the form 'p \wedge q'

It is a false statement. Since 'p \wedge q' has truth value F whenever either p or q or both have the truth value F

(iv) Here component statements are:

p: 2 is an even number. [true]

q: 2 is a prime number. [true]

Given compound statement is of the form 'p \wedge q'.

It is a true statement. Since 'p \wedge q' has truth value T whenever both p and q or both have the truth value T.

Q4. Write the negative on the following simple statements.

(i) The number 17 is prime.

(ii) $2 + 7 = 6$.

(iii) Violets are blue.

(iv) $\sqrt{5}$ is a rational number.

(v) 2 is not a prime number.

(vi) Every real number is an irrational number.

(vii) Cow has four legs.

(viii) A leap year has 366 days.

(ix) All similar triangles are congruent.

(x) Area of a circle is same as the perimeter of the circle.

Sol: (i) The number 17 is not prime.

- (ii) $2 + 7 \neq 6$.
- (iii) Violets are not blue.
- (iv) $\sqrt{5}$ is not a rational number.
- (v) 2 is a prime number.
- (vi) Every real number is not an irrational number.
- (vii) Cow does not have four legs.
- (viii) A leap year does not have 366 days.
- (ix) There exist similar triangles which are not congruent.
- (x) Area of a circle is not same as the perimeter of the circle

Q5. Translate the following statements into symbolic form.

(i) Rahul passed in Hindi and English.

(ii) x and y are even integers.

(iii) 2, 3 and 6 are factors of 12.

(iv) Either x or x + 1 is an odd integer.

(v) A number is either divisible by 2 or 3.

(vi) Either $x = 2$ or $x = 3$ is a root of $3x^2 - x - 10 = 0$

(vii) Students can take Hindi or English as an optional paper.

Sol: (i) p: Rahul passed in Hindi.

q: Rahul passed in English. $p \wedge q$: Rahul passed in Hindi and English.

(ii) p: x is even integers. . q: y is even integers.

$p \wedge q$: x and y are even integers.

(iii) p: 2 is factor of 12. q: 3 is factor of 12. r: 6 is factor of 12.

$p \wedge q \wedge r$: 2, 3 and 6 are factors of 12

(iv) p: x is an odd integer.

q: $(x + 1)$ is an odd integer. $p \vee q$: Either x or $(x + 1)$ is an odd integer.

(v) p: A number is divisible by 2. q: A number is divisible by 3.

$p \vee q$: A number is either divisible by 2 or 3.

(vi) p: $x = 2$ is a root of $3x^2 - x - 10 = 0$. q: $x = 3$ is a root of $3x^2 - x - 10 = 0$

$p \vee q$: Either $x = 2$ or $x = 3$ is a root of $3x^2 - x - 10 = 0$

(vii) p: Students can take Hindi as an optional paper. q: Students can take English as an optional paper.

$p \vee q$: Students can take Hindi or English as an optional paper.

Q6. Write down the negation of following compound statements.

(i) All rational numbers are real and complex.

(ii) All real numbers are rationals or irrationals.

(iii) $x = 2$ and $x = 3$ are roots of the quadratic equation $x^2 - 5x + 6 = 0$

(iv) A triangle has either 3-sides or 4-sides.

(v) 35 is a prime number or a composite number.

(vi) All prime integers are either even or odd.

(vii) $|x|$ is equal to either x or -x.

(viii) 6 is divisible by 2 and 3.

Sol. (i) Let p: All rational numbers are real.

q: All rational numbers are complex.

$\sim p$: All rational numbers are not real.

$\sim q$: All rational numbers are not complex.

Then, the negation of the given compound statement is:

$\sim (p \wedge q)$: All rational numbers are not real or not complex.

$[\sim (p \wedge q) = \sim p \vee \sim q]$

(ii) Let p: All real numbers are rationals. q: All real numbers are irrationals.

Then, the negation of the given compound statement is:

$\sim (p \vee q)$: All real numbers are not rational and all real numbers are not irrational. [$\sim(p \vee q) = \sim p \wedge \sim q$]

(iii) Let p; $x = 2$ is root of quadratic equation $x^2 - 5x + 6 = 0$. q: $x = 3$ is root of quadratic equation $x^2 - 5x + 6 = 0$.

Then, the negation of the given compound statement is:

$\sim (p \wedge q)$: $x = 2$ is not a root of quadratic equation $x^2 - 5x + 6 = 0$ or $x = 3$ is not a root of the quadratic equation $x^2 - 5x + 6 = 0$.

(iv) Let p: A triangle has 3-sides. q: A triangle has 4-sides.

Then, the negation of the given compound statement is:

$\sim (p \vee q)$: A triangle has neither 3-sides nor 4-sides.

(v) Let p: 35 is a prime number. q: 35 is a composite number.

Then, the negation of the given compound statement is:

$\sim (p \vee q)$: 35 is not a prime number and it is not a composite number.

(vi) Let p: All prime integers are even. q: All prime integers are odd.

Then, the negation of the given compound statement is given by

$\sim(p \vee q)$: All prime integers are not even and all prime integers are not odd.

(vii) Let p: $|x|$ is equal to x . q: $|x|$ is equal to $-x$.

Then, the negation of the given compound statement is:

$\sim (p \vee q)$: $|x|$ is not equal to x and it is not equal to $-x$.

(viii) Let p: 6 is divisible by 2. q: 6 is divisible by 3.

Then, the negation of the given compound statement is:

$\sim (p \wedge q)$: 6 is not divisible by 2 or it is not divisible by 3

Q7. Rewrite each of the following statements in the form of conditional statements.

(i) **The square of an odd number is odd.**

(ii) **You will get a sweet dish after the dinner.**

(iii) **You will fail, if you will not study.**

(iv) **The unit digit of an integer is 0 or 5, if it is divisible by 5.**

(v) **The square of a prime number is not prime.**

(vi) **$2b = a + c$, if a, b and c are in AP.**

Sol: (i) If the number is odd number, then its square is odd number.

(ii) If you take the dinner, then you will get sweet dish.

(iii) If you will not study, then you will fail.

(iv) If an integer is divisible by 5, then its unit digits are 0 or 5.

(v) If the number is prime, then its square is not prime.

(vi) If a, b and c are in AP, then $2b = a + c$.

Q8. Form the biconditional statement $p \leftrightarrow q$, where

(i) **p: The unit digits of an integer is zero.**

q: It is divisible by 5.

(ii) **p: A natural number is odd.**

q: Natural number is not divisible by 2.

(iii) **p: A triangle is an equilateral triangle.**

q: All three sides of a triangle are equal.

Sol:(i) $p \leftrightarrow q$: The unit digit of an integer is zero, if and only if it is divisible by 5.

(ii) $p \leftrightarrow q$: A natural number is odd if and only if it is not divisible by 2.

(iii) $p \leftrightarrow q$: A triangle is an equilateral triangle if and only if all three sides of triangle are equal.

Q9. Write down the contra positive of the following statements.

(i) If $x = y$ and $y = 3$, then $x = 3$.

(ii) If n is a natural number, then n is an integer.

(iii) If all three sides of a triangle are equal, then the triangle is equilateral.

(iv) If x and y are negative integers, then xy is positive.

(v) If natural number n is divisible by 6, then n is divisible by 2 and 3.

(vi) If it snows, then the weather will be cold.

(vii) x is a real number such that $0 < x < 1$, then $x^2 < x$.

Sol: (i) If $x \neq 3$, then $x \neq y$ or $y \neq 3$.

(ii) If n is not an integer, then it is not a natural number.

(iii) If the triangle is not equilateral, then all three sides of the triangle are not equal.

(iv) If xy is not positive integer, then either x or y is not negative integer.

(v) If natural number n is not divisible by 2 or 3, then n is not divisible by 6.

(vi) The weather will not be cold, if it does not snow.

(vii) If x^2 is not less than x , then x is not a real number such that $0 < x < 1$.

Q10. Write down the converse of following statements.

(i) If a rectangle R' is a square, then R is a rhombus.

(ii) If today is Monday, then tomorrow is Tuesday.

(iii) If you go to Agra, then you must visit Taj Mahal.

(iv) If sum of squares of two sides of a triangle is equal to the square of third side of a triangle, then the triangle is right angled.

(v) If all three angles of a triangle are equal, then the triangle is equilateral.

(vi) If $x : y = 3 : 2$, then $2x = 3y$.

(vii) If S' is a cyclic quadrilateral, then the opposite angles of S are supplementary.

(viii) If x is zero, then x is neither positive nor negative.

(ix) If two triangles are similar, then the ratio of their corresponding sides are equal.

Sol: (i) If the rectangle ' S ' is rhombus, then it is square.

(ii) If tomorrow is Tuesday, then today is Monday.

(iii) If you must visit Taj Mahal, you go to Agra.

(iv) If the triangle is right angle, then the sum of squares of two sides of a triangle is equal to the square of third side.

(v) If the triangle is equilateral, then all three angles of triangle are equal.

(vi) If $2x = 3y$, then $x : y = 3 : 2$

(vii) If the opposite angles of a quadrilateral are supplementary, then S is cyclic.

(viii) If x is neither positive nor negative, then x is 0.

(ix) If the ratio of corresponding sides of two triangles are equal, then triangles are similar

Q11. Identify the quantifiers in the following statements.

(i) There exists a triangle which is not equilateral.

(ii) For all real numbers x and y , $xy = yx$.

(iii) There exists a real number which is not a rational number.

(iv) For every natural number x , $x + 1$ is also a natural number.

(v) For all real numbers x with $x > 3$, x^2 is greater than 9.

(vi) There exists a triangle which is not an isosceles triangle.

(vii) For all negative integers x , x^3 is also a negative integers.

(viii) There exists a statement in above statements which is not true.

(ix) There exists an even prime number other than 2.

(x) There exists a real number x such that $x^2 + 1 = 0$.

Sol: Quantifier are the phrases like 'There exists' and 'For every', 'For all' etc.

(i) There exists

(ii) For all

- (iii) There exists
- (iv) For every
- (v) For all
- (vi) There exists
- (vii) For all (viii) There exists
- (ix) There exists
- (x) There exists

Q12. Prove by direct method that for any integer 'n', $n^3 - n$ is always even.

Sol. Case I: When n is even.

Let $n = 2k, k \in N$

$$\Rightarrow n^3 - n = (2k)^3 - (2k) = 2k(4k^2 - 1) = 2\lambda, \text{ where } \lambda = k(4k^2 - 1)$$

Thus, $(n^3 - n)$ is even when n is even.

Case II: When n is odd.

Let $n = 2k + 1, k \in N$

$$\begin{aligned} \Rightarrow n^3 - n &= (2k + 1)^3 - (2k + 1) \\ &= (2k + 1)[(2k + 1)^2 - 1] \\ &= (2k + 1)[4k^2 + 1 + 4k - 1] \\ &= (2k + 1)(4k^2 + 4k) \\ &= 4k(2k + 1)(k + 1) = 2\mu, \text{ when } \mu = 2k(k + 1)(2k + 1) \end{aligned}$$

Thus, $n^3 - n$ is even when n is odd.

So, $n^3 - n$ is always even.

Q13. Check validity of the following statements.

(i) p: 125 is divisible by 5 and 7.

(ii) q: 131 is a multiple of 3 or 11.

Sol: (i) We have, P : 125 is divisible by 5 and 7.

Let q: 125 is divisible by 5.

r: 125 is divisible by 7. q is true, r is false.

$\Rightarrow q \wedge r$ is false.

[since, $p \wedge q$ has the truth value F (false) whenever either p or q or both have the truth value F]

Hence, p is not valid.

(ii) We have, p: 131 is a multiple of 3 or 11.

Let q: 131 is multiple of 3.

r: 131 is a multiple of 11.

p is true, r is false.

$\Rightarrow p \vee r$ is true.

[since, $p \vee q$ has the truth value T (true) whenever either p or q or both have the truth value T]

Hence, q is valid.

Q14. Prove the following statement by contradiction method.

p: The sum of an irrational number and a rational number is irrational.

Sol. Let p be false i.e., sum of an irrational and a rational number is rational.

Let \sqrt{m} is irrational and n is rational number.

$$\Rightarrow \sqrt{m} + n = r \quad \text{[rational]}$$

$$\Rightarrow \sqrt{m} = r - n$$

Now, \sqrt{m} is irrational, whereas $(r - n)$ is rational.

This is contradiction.

Then, our supposition is wrong.

Hence, p is true.

Q15. Prove by direct method that for any real number x, y if $x = y$, then $x^2 = y^2$

Sol: Let $p: x = y; x, y \in \mathbb{R}$

On squaring both sides, we get

$$x^2 = y^2 : q$$

$$p \implies q$$

Hence, proved.

Q16. Using contra positive method prove that, if n^2 is an even integer, then n is also an even integer.

Sol: Let $p: n^2$ is an even integer. $q: n$ is also an even integer.

Let $\sim p$ is true i.e., n is not an even integer.

$\Rightarrow n^2$ is not an even integer. [Since square of an odd integer is odd]

$\Rightarrow \sim p$ is true.

Therefore, $\sim q$ is true which provides that $\sim p$ is true.

Hence proved.

Objective Type Questions

Q17. Which of the following is a statement?

(a) x is a real number (b) Switch off the fan

(c) 6 is a natural number (d) Let me go

Sol: (c) As we know that a statement is a sentence which is either true or false.

6 is a natural number; this is true.

Hence, it is a statement.

Q18. Which of the following is not a statement.

(a) Smoking is injurious to health

(b) $2 + 2 = 4$

(c) 2 is the only even prime number

(d) Come here

Sol: (d) No sentence can be called a statement, if it is an order. So, 'Come here' is not a statement.

Q19. The connective in the statement ' $2 + 7 > 9$ or $2 + 7 < 9$ ' is

(a) and

(b) or

(c) >

(d) <

Sol: (b) In ' $2 + 7 > 9$ or $2 + 7 < 9$ ', or is the connective.

Q20. The connective in the statement "Earth revolves round the Sun and Moon is a satellite of earth" is

(a) or

(b) Earth

(c) Sun

(d) and

Sol: (d) Connective word is 'and'.

Q21. The negation of the statement "A circle is an ellipse" is

(a) An ellipse is a circle

(b) An ellipse is not a circle

(c) A circle is not an ellipse

(d) A circle is an ellipse

Sol: (c) Let p: A circle is an ellipse.

$\sim p$: A circle is not an ellipse.

Q22. The negation of the statement "7 is greater than 8" is

(a) 7 is equal to 8

(b) 7 is not greater than 8

(c) 8 is less than 7

(d) None of these

Sol: (b) Let p: 7 is greater than 8.

$\sim p$: 7 is not greater than 8

Q23. The negation of the statement "72 is divisible by 2 and 3" is

(a) 72 is not divisible by 2 or 72 is not divisible by 3

(b) 72 is not divisible by 2 and 72 is not divisible by 3

(c) 72 is divisible by 2 and 72 is not divisible by 3

(d) 72 is not divisible by 2 and 72 is divisible by 3

Sol: (a) We have, p: 72 is divisible by 2 and 3.

Let q: 72 is divisible by 2.

r: 72 is divisible by 3.

$\sim q$: 72 is not divisible by 2.

$\sim r$: 72 is not divisible by 3.

$\sim\{q \wedge r\} \sim q \vee \sim r$

\implies 72 is not divisible by 2 or 72 is not divisible by 3.

Q24. The negation of the statement "Plants take in CO_2 and give out O_2 " is

(a) Plants do not take in CO_2 and do not given out O_2

(b) Plants do not take in CO_2 or do not give out O_2

(c) Plants take is CO_2 and do not give out O_2

(d) Plants take in CO_2 or do not give out O_2

Sol: (b) Now, p: Plants take in CO_2 and give out O_2 .

Let q: Plants take in CO_2 .

r: Plants give out O_2 .

$\sim q$: Plants do not take in CO_2 .

~r: Plants do not give out O_2 .

$\sim(q \wedge r)$: Plants do not take in CO_2 or do not give out O_2 .

Q25. The negative of the statement "Rajesh or Rajni lived in Bangalore" is

(a) Rajesh lives in Bangalore and Rajni did not live in Bangalore

(b) Rajesh did not live in Bangalore and Rajni did not live in Bangalore

(c) Rajesh did not live in Bangalore or Rajni did not live in Bangalore

Sol: (c) We have, p: Rajesh or Rajni lived in Bangalore.

and q: Rajesh lived in Bangalore.

r: Rajni lived in Bangalore.

$\sim q$: Rajesh did not live in Bangalore.

$\sim r$: Rajni did not live in Bangalore.

$\sim (q \vee r)$: Rajesh did not live in Bangalore and Rajni did not live in Bangalore.

Q26. The negation of the statement "101 is not a multiple of 3" is

(a) 101 is a multiple of 3

(b) 101 is a multiple of 2

(c) 101 is an odd number

(d) 101 is an even number

Sol: (a) Let p: 101 is not a multiple of 3.

$\sim p$: 101 is a multiple of 3,

Q27. The contra positive of the statement

"If 7 is greater than 5, then 8 is greater than 6" is

(a) If 8 is greater than 6, then 7 is greater than 5

(b) If 8 is not greater than 6, then 7 is greater than 5

(c) If 8 is not greater than 6, then 7 is not greater than 5

(d) If 8 is greater than 6, then 7 is not greater than 5

Sol: (c) Let p: 7 is greater than 5.

and q: 8 is greater than 6.

$\therefore P \rightarrow q$

$\sim p$: 7 is not greater than 5.

$\sim q$: 8 is not greater than 6.

$(\sim q) \rightarrow (\sim p)$ i.e., if 8 is not greater than 6, then 7 is not greater than 5.

Q28. The converse of the statement "If $x > y$, then $x + a > y + a$ " is

(a) If $x < y$, then $x + a < y + a$

(b) If $x + a > y + a$, then $x > y$

(c) If $x < y$, then $x + a < y + a$

(d) If $x > y$, then $x + a < y + a$

Sol: (b) Let p: $x > y$

q: $x + a > y + a$

$P \rightarrow q$

Converse of the above statement is:

$q \rightarrow P$

i.e., If $x + a > y + a$, then $x > y$

Q29. The converse of the statement "If sun is not shining, then sky is filled with clouds" is

(a) If sky is filled with clouds, then the Sun is not shining

(b) If Sun is shining, then sky is filled with clouds

(c) If sky is clear, then Sun is shining

(d) If Sun is not shining, then sky is not filled with clouds

Sol: (a) Let p: Sun is not shining.

and q: Sky is filled with clouds.

Converse of the above statement $p \rightarrow q$ is $q \rightarrow p$.

If sky is filled with clouds, then the Sun is not shining.

Q30. The contra positive of the statement "If p, then q" is

(a) if q, then p

(b) if p, then $\sim q$

(c) if $\sim q$, then $\sim p$

(d) if $\sim p$, then $\sim q$

Sol:(c) $p \rightarrow q$

If p, then q

Contra positive of the statement $p \rightarrow q$ is $(\sim q) \rightarrow (\sim p)$.

If $\sim q$, then $\sim p$.

Q31. The statement "If x^2 is not even, then x is not even" is converse of the statement

(a) If x^2 is odd, then x is even

(b) If x is not even, then x^2 is not even

(c) If x is even, then x^2 is even

(d) If x is odd, then x^2 is even

Sol: (b) Let p: x^2 is not even.

and q: x is not even.

Converse of the statement $p \rightarrow q$ is $q \rightarrow p$. i.e.,

If x is not even, then x^2 is not even.

Q32. The contra positive of statement 'If Chandigarh is capital of Punjab, then Chandigarh is in India' is

(a) If Chandigarh is not in India, then Chandigarh is not the capital of Punjab

(b) If Chandigarh is in India, then Chandigarh is Capital of Punjab

(c) If Chandigarh is not capital of Punjab, then Chandigarh is not capital of India

(d) If Chandigarh is capital of Punjab, then Chandigarh is not is India

Sol: (a) Let p: Chandigarh is capital of Punjab.

and q: Chandigarh is in India.

$\sim p$: Chandigarh is not capital of Punjab.

$\sim q$: Chandigarh is not in India.

Contra positive of the statement $p \rightarrow q$

if $(\sim q)$, then $(\sim p)$.

If Chandigarh is not in India, then Chandigarh is not the capital of Punjab.

Q33. Which of the following is the conditional $p \rightarrow q$?

(a) q is sufficient for p

(b) p is necessary for q

(c) p only if q

(d) if q then p

Sol: (c) ' $p \rightarrow q$ is same as 'p only if q'.

Q34. The negation of the statement "The product of 3 and 4 is 9" is

(a) it is false that the product of 3 and 4 is 9

(b) the product of 3 and 4 is 12

- (c) the product of 3 and 4 is not 12**
- (d) it is false that the product of 3 and 4 is not 9**

Sol: (a) The negation of the above statement is 'It is false that the product of 3 and 4 is 9'.

Q35. Which of the following is not a negation of "A nature number is greater than zero"

- (a) A natural number is not greater than zero**
- (b) It is false that a natural number is greater than zero**
- (c) It is false that a natural number is not greater than zero**
- (d) None of the above**

Sol: (c) The false negation of the given statement is "It is false that a natural number is not greater than zero".

Q36. Which of the following statement is a conjunction?

- (a) Ram and Shyam are friends**
- (b) Both Ram and Shyam are tall**
- (c) Both Ram and Shyam are enemies**
- (d) None of the above**

Sol: (d) If two simple statements p and q are connected by the word 'and', then the resulting compound statement p and q is called a conjunction of p and q. Here, none of the given statement is conjunction.

Q37. State whether the following sentences are statements or not.

- (i) The angles opposite to equal sides of a triangle are equal.**
- (ii) The moon is a satellites of Earth.**
- (iii) May God bless you.**
- (iv) Asia is a continent.**
- (v) How are you? ,**

Sol: (i) It is a statement.

(ii) It is a statement,

(iii) It is not a statement, since it is an exclamations.

(iv) It is a statement.

(v) It is not a statement, since it is a question.