



MATHS

BOOKS - DISHA PUBLICATION MATHS (HINGLISH)

MATHEMATICAL REASONING

Jee Main 5 Years At A Glance

1. The Boolean expression

$\sim (p \vee q)$ is equivalent to :

A. p

B. q

C. $\sim q$

D. $\sim p$

Answer: D



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2. If $p \rightarrow (\sim p \vee \sim q)$ is false, then the truth values of p and q are respectively.

A. T, F

B. F, F

C. F, T

D. T, T

Answer: D



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3. The following statement $\left(\overrightarrow{pq}\right)\left(\overrightarrow{\sim pq}\right)\overrightarrow{q}$ is:
equivalent to $\overrightarrow{p \sim q}$ (2) a fallacy a tautology (4)
equivalent to $\overrightarrow{\sim pq}$

A. a fallacy

B. a tautology

C. equivalent to $\sim p \rightarrow q$

D. equivalent to $p \rightarrow \sim q$

Answer: B



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4. The proposition $\sim p \vee (p \wedge \sim q)$ is equivalent to

A. $p \rightarrow \sim q$

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

C. $q \rightarrow p$

D. $p \vee (\sim q)$

Answer: B



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5. The Boolean Expression $(p \wedge \sim q) \vee q \vee (\sim p \wedge q)$ is equivalent to:

A. $p \vee q$

B. $p \vee \sim q$

C. $\sim p \wedge q$

D. $p \wedge q$

Answer: A



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6. Consider the following statements.

p : if 7 is an odd number , then 7 is divisible by 2.

Q : If 87 is a prime number , then 7 is an odd number .

if V_1 is the truth value of contrapositive of p and V_2 is the truth value of contrapositive of Q, then the ordered pair (V_1, V_2) equals.

A. (F,F)

B. (F,T)

C. (T,F)

D. (T,T)

Answer: A



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7. The negation of $\sim s \vee (\sim r \wedge s)$ is equivalent to

A. $s \vee (r \vee \sim s)$

B. $s \wedge r$

C. $s \wedge \sim r$

D. $s \wedge (r \wedge \sim s)$

Answer: B



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8. The contrapositive of the statement "If it is raining, then I will not come", is:

- A. If I will not come, then it is raining.
- B. If I will not come, then it is not raining.
- C. If I will come, then it is raining
- D. If I will come, then it is not raining.

Answer: D



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9. The statement $\sim(p \leftrightarrow \sim q)$ is

- A. a tautology
- B. a fallacy
- C. equivalent to $p \leftrightarrow q$

D. equivalent to $\sim p \leftrightarrow q$

Answer: C



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10. The contrapositive of the statement 'I go to school if it does not rain' is 'If it rains, I do not go to school.'

A. If it rains, I do not go to school.

B. If I do not go to school, it rains.

C. If it rains, I go to school.

D. If I go to school, it rains.

Answer: B



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Exercise 1 Concept Builder

1. Which of the following is a statement?

- A. Open the door.
- B. Do your home work.
- C. Switch on the fan.
- D. Two plus two is four.

Answer: (d)



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2. Which of the following is an open statement?

- A. x is a natural number
- B. Give me a glass of water
- C. Wish you best of luck
- D. Good morning to all

Answer: A



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3. Which of the following is a statement in logic?

A. what a great fall it is !

B. Please mind your own business.

C. Let us go for a walk.

D. The quadratic equation $x^2 - 3x + 2 = 0$ has two real roots.

Answer: D



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4. Let If p: prasad work hard.

q: prasad gets good grade.

The verbal form for $(\sim p \rightarrow q)$ is

A. If prasad work hard then he get good grade

B. If prasad does not work hard then he gets good grade.

C. If prasad does not work hard then he does not gets good grade

D. If prasad work hard then he does not gets good grade.

Answer: B



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5. Which of the following is not a statement?

A. Give me a glass of water

B. Asia is a continent

C. The earth revolved round the sun

D. The number 6 has two prime factors 2, 3

Answer: A



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6. If p : Prakash passes the exam, q : Papa will give him a bicycle. Then the statement 'Prakash passing the exam, implies that his papa will give him a bicycle' can be symbolically written as

A. $p \rightarrow q$

B. $p \leftrightarrow q$

C. $p \wedge q$

D. $p \vee \vee q$

Answer: A



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7. Consider the following statement

I. "Every rectangle is a square" is a statement.

II. "Close the door" is not a statement.

Choose the correct option.

- A. Only I is false.
- B. Only II is false.
- C. Both are true.
- D. Bothe are false

Answer: C



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8. Which of the following is not a statement?

- A. Every set is a finite set
- B. 8 is less then 6
- C. Whare are you going?

D. The sum of interior angles of a triangle is 180 degrees

Answer: C



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9. For integers m and n , both greater than 1, consider the following three statements

P : m divides n , Q : m divides n^2 and R : m is prime, then

A. $Q \wedge R \rightarrow P$

B. $P \wedge Q \rightarrow R$

C. $Q \rightarrow R$

D. $Q \rightarrow P$

Answer: A



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10. Which of the following is not a statement in logic?

A. $x+0=x, x \in \mathbb{R}$

B. $1 - \cos^2 \theta = \sin^2 \theta$ for all real θ

C. $x^2 - 3x - 4 = 0, x \in \mathbb{R}$

D. Every set is a finite set

Answer: C



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11. Let p : The question paper is easy. Q : we will pass.

Then the symbolic statement $(\sim P \rightarrow \sim q)$ means.

- A. If the question paper is easy then we shall pass.
- B. If the question paper is not easy then we shall not pass.
- C. The question paper is easy and we shall pass.
- D. The question paper is easy or we shall pass.

Answer: B

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12. Check whether the following statement is true or not. If $x, y \in \mathbb{Z}$ are such that x and y are odd, then xy is odd.

A. $p \Rightarrow q$ is true

B. $\sim q \Rightarrow p$ is true

C. Both (a) and (b)

D. None of these

Answer: A



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13. 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 these

Answer: D



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14. The statement, 'r is sufficient for s', is also expressed as.

A. s if r

B. r only if s'

C. r implies s'

D. all of these

Answer: D



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15. If p and q are two simple propositions, then $p \rightarrow q$ is false when

A. p is true and q is false

B. p is false but q is true

C. at least one of p or q is false

D. both p and q are false

Answer: A



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16. Consider the following

I. New Delhi is in Nepal.

II. Every relation is a function. III. Do your homework.

Choose the correct option.

A. I and II are statements.

B. I and III are statements.

C. II and III are statements.

D. I, II and III are statements.

Answer: A



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17. For two statement p and q

p : A quadrilateral is a parallelogram

q : The opposite sides are parallel

Then, the compound proposition, "A quadrilateral is a parallelogram if and only if the opposite sides are parallel" is represented by

A. $p \vee q$

B. $p \rightarrow q$

C. $p \wedge q$

$$D. P \leftrightarrow q$$

Answer: D



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18. If p is true and q is false, then which of the following statements is NOT true ?

A. $p \vee q$

B. $p \Rightarrow q$

C. $p \wedge (\sim q)$

D. $p \Rightarrow p$

Answer: B



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19. Which of the following is not a statement in logic?

A. The sum of angles of a quadrilateral is 180° .

B. Every statement has one truth value.

C. $\sqrt{3}$ is an irrational number.

D. $x + 5 = 7, x \in \mathbb{Q}$.

Answer: D



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20. For the statement "17 is a real number or a positive integer", the "or" is

- A. Inclusive
- B. Exclusive
- C. Only
- D. None of these

Answer: A



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21. Consider the following statements :

p: It rains today

q: I go to school

r: I Shall meet any friends

s: I shall go for a movie

Then which of the following proposition represents 'If it does not rain or if I do not go to school, then I shall meet my friend and go for a movie .!'

A. $\sim(p \wedge q) \Rightarrow (r \wedge s)$

B. $\sim(p \wedge \sim q) \Rightarrow (r \wedge s)$

C. $\sim(p \wedge q) \Rightarrow (r \vee s)$

D. None of these

Answer: A



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22. Which of the following sentences are statements?

Give reasons for your answer.(i) There are 35 days in a month.(ii) Mathematics is difficult.(iii) The sum of 5 and 7 is greater than 10.(iv) The square of a number is an even number.(v)

A. a statement

B. not a statement

C. may be statement or not

D. None of these

Answer: A



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23. The dual of the compound statement $\sim p \wedge [\sim(q \vee r)]$ is

A. $\sim p \wedge [\sim(q \wedge r)]$

B. $\sim p \vee [(q \vee r)]$

C. $\sim p \vee [\sim(q \wedge r)]$

D. None of these

Answer: C



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24. 29. If p is any statement, t is a tautology and c is a contradiction then which of the following is not correct-

A. $p \vee (\sim p) = c$

B. $p \vee t = t$

C. $p \wedge c = c$

D. $p \wedge c = c.$

Answer: A



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25. Draw Venn diagram to represent the truth of the statement "No child is naughty"

Where U = Universal set of human beings

C = Set of children

N = Set of naughty persons

A. 

B. 

C. 

D. None of these

Answer: A



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26. The dual of the statement $(p \wedge q) \vee \sim q = p \vee \sim$ is

A. $(p \wedge q) \wedge \sim q = p \wedge \sim q$

B. $(p \vee q) \wedge \sim q = p \wedge \sim q$

C. $(p \wedge q) \vee \sim q = p \vee \sim q$

$$D. (p \wedge q) \vee \sim q \Rightarrow p \vee \sim q$$

Answer: B



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27. The dual of statement $[p \vee q] \wedge \sim q \vee \sim q$ is

A. $[(p \wedge q) \wedge \sim q] \vee \sim q$

B. $[(p \wedge q) \wedge \sim q] \vee \sim q$

C. $[(p \wedge q) \vee \sim p] \vee (\sim q)$

D. $[(p \wedge q) \vee \sim p] \wedge (\sim q)$

Answer: C



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28. Which of the following is equivalent to $(p \wedge q)$: (a)

$p \rightarrow \sim q$ (b) $\sim(\sim p \wedge \sim q)$ (c) $\sim(p \rightarrow \sim q)$ (d) Non of these

A. $p \Rightarrow q \sim = \sim p \Rightarrow \sim q$

B. $\sim(p \Rightarrow \sim q) \sim = \sim p \wedge q$

C. $\sim(\sim p \Rightarrow \sim q) \sim = \sim p \wedge q$

D. $\sim(\sim p \Leftrightarrow q) \sim = [\sim(p \Leftrightarrow q) \wedge \sim(q \Rightarrow p)]$

Answer: C

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29. The dual of statement $[p \vee q] \wedge \sim q \vee \sim q$ is

A. $[(p \vee q) \wedge \sim q] \vee \sim q$

B. $[(p \wedge q) \wedge \sim p] \vee (\sim q)$

C. $[(p \wedge q) \vee \sim p] \vee (\sim q)$

D. $[(p \wedge q) \vee \sim p] \wedge (\sim q)$

Answer: C



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30. Which of the following is a contradiction

A. $(p \wedge q) \wedge \sim(p \vee q)$

B. $p \vee (\sim p \wedge q)$

C. $(p \Rightarrow q) \Rightarrow p$

D. None of these

Answer: A



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31. If p and q are two statement then $(p \rightarrow \sim q)$ is true when : (a) p and q both are true (b) p and q both are false (c) p is false and q is true (d) Non of these

A. p and q both are true

B. p and q both are false

C. p is false and q is true

D. None of these

Answer: C



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32. Which of the following is true?

A. $p \wedge p = T$

B. $p \vee p = F$

C. $p \rightarrow q \cong q \sim \rightarrow p$

D. $p \rightarrow q \sim = (\sim q) \rightarrow (\sim p)$

Answer: D



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33. The compound statement $p \rightarrow (\sim p \vee q)$ is false, then the truth values of p and q are respectively.

A. T, T

B. T, F

C. F, T

D. F, F

Answer: B



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34. Which of the following is not logically equivalent to the proposition? " A real number is either rational or irrational."

A. If a number is neither rational or nor irrational
then it is not real

B. If a number is not a rational or not an irrational,
then it is not real

C. If a number is not real, then it is neither ration nor
irreational

D. If a number is real, then it is rational or irrational.

Answer: B



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35. The conditional statement $(p \wedge q) \rightarrow p$ is

- A. A tautology
- B. A fallacy i.e., contradiction
- C. Neither tautology nor fallacy
- D. None of these

Answer: A



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36. If p, q and r are simple propositions such that $(p \wedge q) \wedge (q \wedge r)$ is true, then

- A. p, q, r are all false
- B. p, q, r are all true
- C. p, q are true and q and r false
- D. p is true and r are false

Answer: B



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37. $\sim(p \rightarrow q) \rightarrow [(\sim p) \vee (\sim q)]$ is

A. a tautology

B. a contradiction

C. neither a tautology nor contradiction

D. cannot come any statement.

Answer: A



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38. Consider the following statement.

"If a triangle is equiangular, then it is an obtuse angled triangle."

This is equivalent to

I. a triangle is equiangular implies that it is an obtuse

angled triangle.

II. For a triangle to be obtuse angled triangle it is sufficient that it is equiangular.

Choose the correct option.

A. Both are correct.

B. Both are incorrect.

C.

D. Only 1 is correct.

Answer: A



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39. Negation of the proposition : If we control population growth, we prosper

- A. If we do control population growth, we prosper
- B. If we control population growth, we do not prosper
- C. we control population but we do not
- D. We do not control population. But we prosper

Answer: C



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40. Consider the following statements :

p: He is intelligent

q: He is strong

Then symbolic form of statements 'it is wrong that he is intelligent or strong's

A. $\sim P \vee Q$

B. $\sim P \wedge \sim Q$

C. $\sim P \wedge Q$

D. $\sim(P \vee Q)$

Answer: D



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41. The inverse of the statement $(p \wedge \sim q) \rightarrow r$ is

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

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

C. $(\sim p \vee q) \rightarrow \sim r$

D. None of these

Answer: C



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42. The contrapositive of the statement, 'If I do not Secure good marks then I cannot go for engineering', is

- A. If I secure good marks, then I go for engineering.
- B. If I go for engineering then I secure good marks
- C. If I cannot go for engineering then I donot secure good marks.
- D. None.

Answer: B



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43. Which of the following is the converse of the statement? "if Billu secure good marks, then he will get a bicycle."

A. If billu will not get bicycle, then he will not secure good marks.

B. If billu will get a bicycle, then he will secure good marks

C. If Billu will get a bicycle, then he will not secure good marks.

D. If Billu will not get a bicycle, then he will secure good marks.

Answer: B



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44. If p , q and r are any three logical statements, then which one of the following is correct ?

A. $\sim[p \wedge (\sim q)] \sim (\sim p) \wedge q$

B. $\sim[(p \vee q) \wedge (\sim r)] \sim (\sim q) \vee \sim(\sim r)$

C. $\sim[p \vee (\sim q)] \sim (\sim p) \wedge q$

D. $\sim[p \vee (\sim q)] \sim (\sim p) \wedge \sim q$

Answer: C



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45. Negation of the statement $(p \wedge r) \rightarrow (r \vee q)$ is-

A. $\sim(p \wedge r) \rightarrow \sim(r \vee q)$

B. $(\sim p \vee \sim r) \wedge (r \vee q)$

C. $(p \wedge r) \wedge (r \wedge q)$

D. $(p \wedge r) \wedge (\sim r \wedge \sim q)$

Answer: D



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46. Write the negation of the compound proposition . "If the examination is difficult, then I shall pass if I study hard".

- A. The examination is difficult and I study hard but I shall not pass
- B. The examination is difficult and I study hard and I shall not pass
- C. The examination is not difficult and I study hard and I shall pass
- D. None of these

Answer: A



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47. Consider the following statements

P: Suman is brilliant

Q: Suman is rich

R: Suman is honest

The negation of the statement "Suman is brilliant and dishonest if and only if Suman is rich" can be expressed as

A. $\sim Q \leftrightarrow \sim P \vee R$

B. $\sim Q \leftrightarrow \sim P \wedge R$

C. $\sim(P \wedge \sim R) \leftrightarrow Q$

D. $\sim P \wedge (Q \leftrightarrow \sim R)$

Answer: A



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48. The contrapositive of $p \rightarrow (\sim q \rightarrow \sim r)$ is-

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

B. $(q \rightarrow r) \rightarrow \sim p$

C. $(q \vee \sim r) \rightarrow \sim p$

D. None of these

Answer: A



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49. Negation of "Ram of in class X or Rashmi is in Class XII" is

- A. Ram is not in class X but Ram is in class XII
- B. Ram is not in class X but Rashmi is not in class XII
- C. Either Ram is not in class X or Ram is not in class XII
- D. None of these

Answer: D



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50. Let p : I am Brave,

q : I will climb the Mount Everest.

The symbolic form of a statement.

I am neither brave nor I will climb the mount Everest' is

A. $p \wedge q$

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

C. $\sim p \wedge \sim q$

D. $\sim p \wedge q$

Answer: C



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51. Let $p \wedge (q \vee r) = (p \wedge q) \vee (p \wedge r)$. Then this law is known as

A. Commutative law

B. Associative law

C. De-Morgan's law

D. Distributive law

Answer: D



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52.

The negation of the statement $= [(\sim p \wedge q) \vee (p \wedge \sim q)]$

is

A. $(p \vee \sim q) \wedge (\sim p \vee q)$

B. $(p \vee \sim q) \vee (\sim p \vee q)$

C. $(p \wedge \sim q) \wedge (\sim p \vee q)$

D. $(p \vee \sim q) \wedge (p \vee \sim q).$

Answer: A



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53. Consider the following statement

I: The negation of the statement "The number 2 is greater than 7" is "The number 2 is not greater than 7".

II: The negation of the statement "Every natural number is an integer" is every natural number is not an integer".

Choose the correct option.

- A. Only I is true
- B. Only II is true
- C. Both are true
- D. Both are false

Answer: C



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54. Let p : Kiran passed the examination,

q : Kiran is sad

The symbolic form of a statement "It is not true that Kiran passed therefore he is sad" is

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

B. $(p \rightarrow q)$

C. $\sim(p \rightarrow \sim q)$

D. $\sim(p \leftrightarrow q)$

Answer: B



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55. The negation of the statement $= (p \vee q) \wedge r$ is

A. $(\sim p \vee \sim q) \vee \sim r$

B. $(\sim p \wedge \sim q) \vee \sim r$

C. $\sim(p \vee q) \rightarrow r$

D. $p \wedge q$.

Answer: B



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56. The converse of the statement if 'x lt y; then $x^2 < y^2$ ' is

A. If x is not less than y then x^2 is not less than y^2

B. If $x^2 < y^2$ then $x < y$

C. If $x^2 \geq y^2$ then $x \geq y$

D. None

Answer: B



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57. If Ram secures 100 marks in maths, then he will get a mobile. The converse is

A. If Ram gets a mobile, then he will not secure 100

Marks

- B. If Ram does not get a mobile, then he will secure 100 marks
- C. If Ram will get a mobile, then he secures 100 marks in maths
- D. None of these

Answer: C



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58. The converse of 'If x is zero then we cannot divide by x ' is

- A. If we cannot divide by x , then x is zero

B. If we cannot divide by x , then x is not zero

C. If x is not zero then we divide by x

D. None.

Answer: C



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59. Let f be a function from a set X to a set Y . Consider the following statements:

P : For each $x \in X$, there exists unique $y \in Y$ such that $f(x)=y$

Q : For each $y \in Y$, there exists $x \in X$ such that $f(x) = y$.

R: there exist $x_1, x_2 \in X$ such that $x_1 \neq x_2$ and $f(x_1) = f(x_2)$

x_2).

The negation of the statement "f is one-to-one and onto" is

A. P or not R

B. R or not P

C. R or not Q

D. P and not R

Answer: C



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60. If p is any statement, t and c are a tautology and a contradiction respectively then which of the following is not correct- (a) $p \wedge t = p$ (b) $p \wedge c = c$ (c) $p \vee t = c$ (d) $p \vee c = p$

A. $p \vee (\sim p) = c$

B. $p \vee t = t$

C. $p \wedge t = p$

D. $p \wedge c = c$.

Answer: A



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Exercise 2 Concept Applicator

1. Let p : Kiran passed the examination

q : Kiran is sad

The symbolic form of a statement "it is not true Kiran passed therefore she is sad" is

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

B. $(p \rightarrow q)$

C. $\sim(p \rightarrow \sim q)$

D. $\sim(p \leftrightarrow q)$

Answer: B



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2. If p denotes "It is cold" and q denote "It rains" , write the statements in symbolic form.

A sufficient condition for it to be cold is that it rains.

A. $p \wedge (\sim q)$

B. $p \wedge q$

C. $(\sim p) \wedge q$

D. $\sim(p) \wedge (\sim q)$

Answer: A



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3. If p, q, r are statement with truth vales F, T, F respectively. Then the truth value of $p \rightarrow (q \rightarrow r)$ is



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4. If $S(p, q, r) = (\sim p) \vee (\sim(q \wedge r))$ is a compound statement, then $S(\sim p, \sim q, \sim r)$ is

A. $S(p, q, r)$

B. $\sim S(\sim p, \sim q, \sim r)$

C. $\sim S(p, q, r)$

D. $S^*(p, q, r)$

Answer: C



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5. If p : Ashok works hard: q : Ashok gets good grade The verbal form for $(\sim p \rightarrow q)$ is If Ashok works hard then gets good grade If Ashok does not work hard then he gets good grade If Ashok does not work hard then he does not get good grade Ashok works hard if and only if he gets good grade

A. If Ashok work hard then then get good grade

B. If Ashok does not work hard then he gets good grade

C. If Ashok does not work hard then he does not get good grade

D. Ashok work hard if he gets grade

Answer: B



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6. Which of the following is not a statement?

A. Roses are red

B. New Delhi is in india

C. Every square ia a rectangle

D. Alas! I have failed

Answer: D



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7. Write the negation of the compound proposition . "If the examination is difficult, then I shall pass if I study hard".

A. The examination is difficult and I study hard but I shall not pass

B. The examination is difficult and I study hard and I shall pass

C. The examination is not difficult and I study hard
and I shall pass

D. None of these

Answer: A



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8. If p : 'Ram is tall' and q : 'Ram is intelligent' , then the statement $\sim p \vee q$ is

A. Raju is not tall or he is intelligent.

B. Raju is tall or he is intelligent.

C. Raju is not tall and he is intelligent

D. Raju is not tall implies he is intelligent

Answer: A



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9. which of the following is/are connectives?

A. Today

B. Yesterday

C. Tomorrow

D. "And", "or"

Answer: D



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10. $(p \wedge \sim q) \wedge (\sim p \wedge q)$ is a

A. a tautology

B. a contradiction

C. both a tautology and a contradiction

D. neither a tautology nor a contradiction

Answer: B



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11. Consider the statement p : 'New Delhi is a city'. Which of the following is not negation of p ?

- A. New Delhi is not a city
- B. Its is false that New Delhi is a city
- C. It is not the case that New Delhi is a city
- D. None of there

Answer: D



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12. Write the negation of statement $\sqrt{2}$ is not a complex number.

- A. $\sqrt{2}$ is a rational number
- B. $\sqrt{2}$ is an irrational number
- C. $\sqrt{2}$ is a complex number
- D. None of the above

Answer: C



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13. Which of the following statement is a contradiction:

- (1) $(\sim p \vee \sim q) \vee (p \vee \sim q)$, (2) $(p \rightarrow q) \vee (p \wedge \sim q)$, (3)
 $(\sim p \wedge q) \wedge (\sim q)$

- A. $(\sim p \vee \sim q) \vee (p \vee \sim q)$

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

C. $(\sim p \wedge q) \wedge (\sim q)$

D. $(\sim p \wedge q) \vee (\sim q)$

Answer: C



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14. If p, q and r simple propositions with truth values T, F, T, then the truth value of $(\sim p \vee q) \wedge \sim q \rightarrow p$ is

A. True

B. False

C. True if r is false

D. true if q is true

Answer: B



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15. Consider the following Statements p : A tumbler is half empty.

A tumbler is half full.

Then, the combination form of "p if and only if q" is

A. a tumbler is half empty and half full

B. a tumbler is half empty if and only if it is half full

C. Both (a) and (b)

D. None of the these

Answer: B



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16. The contrapositive of $(p \vee q) \rightarrow r$ is

A. $r \Rightarrow (p \vee q)$

B. $\sim r \Rightarrow (p \vee q)$

C. $\sim r \Rightarrow \sim p \wedge \sim q$

D. $p \Rightarrow (q \vee r)$

Answer: C



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17. If $p \rightarrow (\sim p \vee q)$ is false, the truth values of p and q are , respectively

A. F, T

B. F, F

C. T, T

D. T, F

Answer: D

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18. $\sim(\sim p \wedge q)$, is equal to

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

B. $p \vee q$

C. $p \wedge (\sim q)$

D. $\sim p \wedge \sim q$

Answer: A



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19. The contrapositive of inverse of $p \rightarrow \sim q$ is

A. $\sim q \vee (\sim q)$

B. $p \Rightarrow q$

C. $\sim q \Rightarrow \sim p$

D. $\sim p \Rightarrow \sim q$

Answer: A



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20. Identify the False statements

A. $[p \vee (\sim q)] \sim = (\sim p) \vee q$

B. $[p \vee q] \vee (\sim p)$ is a tautology

C. $[p \wedge q] \wedge (\sim p)$ is a contradiction

D. $\sim[p \vee q] \sim = (\sim p) \vee (\sim q)$

Answer: D



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21. If $p \Rightarrow (q \vee r)$ is false, then the truth values of p, q, r are respectively

A. T, F, F

B. F, F, F

C. F, T, T

D. T, T, F

Answer: A



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22. Let p : Kiran passed the examination,

q : Kiran is sad

The symbolic form of a statement "It is not true that Kiran passed therefore he is sad" is

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

B. $(p \rightarrow q)$

C. $\sim(p \rightarrow \sim q)$

D. $\sim(p \leftrightarrow q)$

Answer: B



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23. If p denotes "It is cold" and q denote "It rains" , write the statements in symbotic form.

A necessary condition for it to be cold is that it rains.

A. $p \wedge (\sim q)$

B. $p \wedge q$

C. $(\sim p) \wedge q$

D. $(\sim P) \wedge (\sim q)$

Answer: A



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24. Which of the following is true?

A. $p \Rightarrow q \sim \sim p \Rightarrow \sim q$

B. $\sim(p \Rightarrow \sim q) \sim \sim p \wedge q$

C. $\sim(\sim p \Rightarrow \sim q) \sim p \wedge q$

D. $\sim(\sim p \Leftrightarrow q) \sim [\sim(p \Leftrightarrow q) \wedge \sim(q \Rightarrow p)]$

Answer: C



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25. The proposition $(p \rightarrow \sim p) \wedge (\sim p \rightarrow p)$ is a

A. Tautology and contradiction

B. Neither tautology nor contradiction

C. Contradiction

D. Tautology

Answer: C



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26. Consider the following statements -

p : 4 is an even prime number

q : 6 is a faactor of 12

r : H . C .F of 4 and 6 is 12 which compound statemnets are false -

A. $(p \wedge q)$

B. $(p \vee q) \wedge \sim r$

C. $\sim(q \wedge r)p$

D. $\sim p \vee (q \wedge r)$

Answer: D



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27. If p, q are true and r is false statement then which of the following is true statement?

A. $(p \wedge q) \vee r$ is F

B. $(p \wedge q) \rightarrow r$ is T

C. $(p \vee q) \wedge (p \vee r)$ is T

D. $(p \rightarrow q) \leftrightarrow (p \rightarrow r)$ is T

Answer: C



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28. Which of the following statement is a contradiction:

(1) $(\sim p \vee \sim q) \vee (p \vee \sim q)$, (2) $(p \rightarrow q) \vee (p \wedge \sim q)$, (3)

$(\sim p \wedge q) \wedge (\sim q)$

A. $(\sim p \Rightarrow q) \Rightarrow \sim q \Rightarrow \sim p$

B. $(\sim p \vee q) \Rightarrow \sim p \vee \sim q$

C. $\sim(p \Rightarrow q) \Rightarrow \sim p \wedge \sim q$

D. $\sim(p \vee q) \Rightarrow \sim p \wedge \sim q$

Answer: C



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29. If $\sim q \vee p$ is F, then which of the following is correct?

A. $p \leftrightarrow q$ is T

B. $p \rightarrow q$ is T

C. $q \rightarrow p$ is T

D. $p \rightarrow q$ is F

Answer: B



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30. If p and q are true statement and r, s are false statement, then the truth value of $\sim[(p \wedge \sim r) \vee (\sim q \vee s)]$ is

- A. True
- B. False
- C. false if p is true
- D. None of these

Answer: B



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