MATHS

BOOKS - HIMALAYA MATHS

(KANNADA ENGLISH)

MATHEMATICAL REASONING

Question Bank

1. Which of the following is not a proposition?

A. Bring me a glass of a water

B. They a played a good cricket

C. 475 is an even integer

D. He is handsome

Answer: C

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2. If in two triangles DEF and PQR, $\lfloor D = \lfloor Q$, and $\lfloor R = \lfloor E$ which of the following is not true?

A. For any statement p, `p nu (

B.

C.

D.

Answer: C

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3. Which of the following is not a propostion?

A. Wish you good luck in the examination

B. Red Fort is in Mumbai

C. $3 + 7 \geq 4 + 1$

D. ~ilar triangles are congruent

Answer: A

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4. Which of the following is not a propostion?

A. There are only finite number of primes

B. Every even integer is divisible by 2

C. Inverse of a singular matrix does not exist

D. None

Answer: D

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5. Which of the following is a propostion?

A. Bring me a glass of a water

B. What a beautiful flower it is!

C. Sum of two integers is again an integer

D. Logic is interesting

Answer: C

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6. Which of the following is not a proposition?

A. Mathematics is an interesting subject

B. Are we going out today?

C. He looks very young at this age

D. None of these

Answer: D

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7. If pdenotes " congruent triangles are ~ilar" and qdenotes " the grass is green" then symbol $p \wedge \sim q$ means

A. Congruent triangles are ~ilar and the grass is green

B. Congruent triangles are ~ilar or the grass is not green

C. Congruent triangles are ~ilar and the grass is not green

D. Congruent triangles are ~ilar and the grass is green

Answer: C

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8. Let p be the proposition "Delhi is in Karnataka" and q be the proposition "Mumbai is in M.P." The symbol $p \rightarrow (\sim q)$ means

A. If Delhi is in Karnataka then Mumbai is not in M.P.

B. If Delhi is in Karnataka and Mumbai is in M.P.

C. Delhi is in Karnataka and Mumbai is in M.P.

D. If Delhi is not Karnataka then Mumbai is also not in M.P.

Answer: A

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9. Let pdenote the proposition "Sunset in East" and qbe the proposition "$2 + 7 = 8$", then the symbol $q \rightarrow p$, means

A. If $2 + 7 + 8$ then Sun sets in East

B. If $2 + 7 = 8$ then Sun sets in East

C. If $2 + 7 \neq 8$ and Sun does not set in East

D. If $2 + 7 = 8$ and Sun does not set in East

Answer: B

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10. Let p:Suraj passes in Mathematics. q: Prof X resigns from the job. r : College conducts an enquiry Then, the symbol $p \rightarrow (q \wedge r)$ means

A. If Suraj passes in Mathematics, then Prof. X resigns the job or college will conduct an enquiry

B. If Suraj passes in Mathematics and Prof. X resigns the job or college will conduct an enquiry

C. Suraj passes in mathematics and Prof.X resigns but college will not conduct an enquiry

D. None of these

Answer: B

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11. Let p: 32 is a multiple of 8. q: 17 is a prime number. r : $3 + 7 = 11$. The symbolic form of

the statement : "32 is a multiple of 8 and 17 is a prime number but `3 + 7 ne 7", is

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

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

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

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

Answer: C

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12. Let p: 2 + 3 = 5, $q = \sqrt{2}$ is irrational. The symbolic form of the statement. " It is not true that $2 + 3 = 5$ if and only if $\sqrt{2}$ is irrational ", is

A. $\sim p \leftrightarrow q$

B. $\sim p \leftrightarrow \sim q$

C. `~(p harr ~q)

D. ~(p harr q)

Answer: D

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13. Let p: Banglore is the capital fo Maharastra q: Paris is in England r: 7 is greater than 10. The symbolic form of the statement 7 is greater than 10 if and only if, Bangalore is the capital of Maharastra or Pari is in England, is

A. $r \leftrightarrow (p \nu q)$

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

C. $r \leftrightarrow \sim(p \nu q)$

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

Answer: A

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14. Let p : 3 + 4 =7, q : 4 is a prime integer. The symbolic form of the statement. " A necessary condition that $3+4=7$ is that 4 is a prime integer " is given by

A. $q \to p$

B. $p \to q$

C. $p \mu q$

D. $p \nu q$

Answer: B

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15. The statement, $(a.\, b = 0) \rightarrow (a = 0 \text{ or } b = 0)$ where a and b are real numbers means

A. $a = 0$ or $b = 0$ is a necessary condition for `a . b = 0

B. If $a.\ b \neq then$a = 0 or b = 0

C. If $a \neq 0$ and $b \neq 0$ then `a . b=0

D. None of these

Answer: A

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16. If a function $f(x)$ is differentiable at x = c prove that it is continuous at x = c.

A. Sufficient condition for f(x) is to differentiable at x = a

B. Necessary condition for f(x) to be differentiable at x = a is it si continous at x = a

C. Continuity os f(x) of x = a implies differentiability at x = a

D. not differentiability of f(x) implies not continuity at x = a

Answer: B

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17. The proposition $(p \wedge q)$ to $(r \vee \sim s)$ is known to be false. Then the truth values of p, q, r and s respectively

A. T, F, T, T

B. T,T,T, F

C. T, T, F, F

D. T, T, F, T

Answer: D

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18. The proposition $p \wedge \sim(q \vee r)$ is known to true, then the truth values of p, q, r respectively

A. T, T, F

B. T, F, F

C. T, F, T

D. F, T, T

Answer: B

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19. The proposition $(p \wedge \sim q) \wedge \sim r$ is given to be true statement. Then the truth values of p, q and r respectively

A. T, F, F

B. F, T, T

C. T, F, T

D. T, T, F

Answer: A

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20. The proposition $p \vee \sim(q \wedge r)$ is given to be false, then the truth values of p, q and r are respectively

A. T, F, T

B. T, T, F

C. F,T, T

D. T, F, F

Answer: C

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21. If $p \to (\sim p \vee q)$ is given to be a false statement then the truth values of p and q respectively.

A. F, T

B. T, T, F

C. F, F

D. T, F

Answer: D

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22. If p, q, and r are proposition with truth values F, T and F respectively, then the truth values of $(p \wedge \sim q) \rightarrow r$, $(p \vee q) \rightarrow r$ and $q \rightarrow (p \wedge r)$

A. T, T, F

B. T, F, T

C. T, F, F

D. T, T, T

Answer: C

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23. " If $x - 2 = 3$ and $y = -2 then$ 2x + y = 3`" The contrapositive of this statement is

A. If $(x - 2) \neq 3$ and $y = -2$ then ` (2x + y = 3)

B. If $(2x + y \neq 3)$ then ` (x - 2 = 3 or y = -2)

C. If $(2x + y \neq 3)$ then $(x - 2 \neq 3)$ and $(y \neq -2)$

D. If $(x - 2 \neq 3)$ and $(y \neq -2)$ then $(2x + y \neq 3)$

Answer: B

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24. The inverse of the proposition "If two numbers are not equal then their squares are not equal"

A. If two numbers are equal then their squares are equal

B. If two numbers are not equal then their squares are equal

C. If the squares of two numbers are equal then the numbers are not equal

D. If two numbers are equal then their squares are not equal

Answer: C

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25. The inverse of the statement " If an integer is greater than 3 and less than 5 then it is a multiple of 4" is

A. If an integer is not greater than 3 and not less than 5 then it is not a multiple of 4

B. If an integer is not greater than 3 and not less than 5 then it is not a multiple of 4

C. If an integer is not greater than 3 or not less than 5 then it is a multiple of 4

D. If

Answer: C

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26. The inverse of the conditional " If $x \in (A \cup B)$ then $x \in A$ or $x \in B$" is

A. If $x \notin A$ and $x \notin B$ then $x \notin A \nu B$

B. If $x \notin A$ or $x \notin B$ then $x \notin A \nu B$

C. If $x \notin A$ or $x \in B$ then $x \in A \nu B$

D. If $x \notin (A \nu B)$ then $x \notin A$ or $x \notin B$

Answer: C

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27. The inverse of the conditional " If $x \in (A \cup B)$ then $x \in A$ or $x \in B$" is

A. If $x \notin A$ or $x \notin B$ then $x \notin A \mu B$

B. If $x \notin A$ and $x \notin B$ then $x \notin A \mu B$

C. If $x \notin A$ or $x \notin B$ then $x \in A \nu B$

D. If $x \notin A$ and x in B then $x \in A \mu B$

Answer: B

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28. The inverse of the conditional " If $x \in (A \cup B)$ then $x \in A$ or $x \in B$" is

A. If $x \in A \nu B$ then $x \notin A$ and $x \notin B$

B. If $x \notin A \nu B$ then $x \notin A$ or $x \notin B$

C. If $x \notin A$ or $x \notin B$ then $x \notin A \nu B$

D. If $x \notin A$ and $x \notin B$ then $x \notin A \cup B$

Answer: B

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29. The contrapositive of " If $x \in A \cap B$ then $x \in A$ and $x \in B$ is

A. If $x \notin A$ and $x \notin B$ then $x \notin A \nu B$

B. If $x \notin A$ or $x \notin B$ then $x \notin A \nu B$

C. If $x \notin A$ or $x \in B$ then $x \notin A \nu B$

D. If $x \notin A$ and $x \in B$ then $x \notin A \nu B$

Answer: B

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30. Negation of the statement $\sim p \rightarrow (q \vee r)$ is

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

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

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

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

Answer: C

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31. The negation of the proposition " If a quadrilateral is a square then it is a rhombus", is

A. If a quadrilateral is not a square then it is a rhombus

B. If a quadrilateral is a square then it is not a rhombus

C. If a quadrilateral is a square and it is not a rhombus

D. Quadrilateral is nota square or it is not a rhombus

Answer: C

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32. The negation of the statement" He is neither quiet nor practical", is

A. He is either quiet or practical

B. He is not quiet and not practical

C. He is quiet and practical

D. none of these

Answer: A

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33. The negation of $p \rightarrow (q \wedge r)$ is

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

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

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

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

Answer: C

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34. The negation of $(p \to q) \vee (p \to r)$ is

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

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

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

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

Answer: D

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35. The negation of the proposition " 4 is the divisor of 48 and 325 is not divisible by 4", is

A. 4 is not a divisor of 48 or 4 divides 325

B. 4 is a divisor of 48 and 325 is divisible by 4

C. 4 is a divisor of 48 or 4 is not a divisor of 325

D. none of these

Answer: A

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36. The inverse of the statement " If an integer is greater than 3 and less than 5 then it is a multiple of 4" is

A. An integer is greater than 3 and less than 5 but it is not a multiple of 4

B. An integer not greater than 3 but less than 5 and it is not a multiple of 4

C. If an integer is greater than 3 and less than 5 then it is not a multiple of 4

D. None of these

Answer: A

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37. Negation of $(p \rightarrow q) \wedge (q \wedge p)$ is

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

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

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

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

Answer: A

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38. The negation of the statement "If $x \in A \nu B$ then $x \in A$ and $x \in B$" is

A. $x \notin (A \nu B)$ and $(x \notin A \text{ or } x \notin B)$

B. $x \in (A \nu B)$ and $(x \notin A \text{ or } x \notin B)$

C. $x \notin (A \mu B)$ and $(x \notin A \text{ or } x \notin B)$

D. None of these

Answer: B

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39. The negation of the statement "If $x \in A \cup B$ then $x \in A$ and $x \in B$" is

A. $x \notin (A \mu B)$ and $(x \in A \text{ or } x \in B)$

B. $x \in (A \mu B)$ and $(x \notin A \text{ or } x \notin B)$

C. $x \in (A \mu B)$ but $(x \notin A \text{ and } x \notin B)$

D. $x \notin (A \cup B)$ but $(x \notin A \text{ or } x \notin B)$

Answer: C

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40. Which of the following is always true

A. $p \wedge (q \vee r) \cong (p \wedge q) \wedge r$

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

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

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

Answer: C

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41. The negation of the statement " If he is successful then he will join engineering course or medical course" is

A. He is successful and joined engineering course but not medical course

B. He is not successful and not joined neither engineering nor medical course

C. He is successful and joined medical course

D. He is successful but he joined neither engineering nor medical course

Answer: C

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42. The statement that is not correct is

A. It is raining and the weather is not pleasant

B. It is not raining or weather is pleasant

C. It is raining or weather is not pleasant

D. It is raining and the weather is pleasant

Answer: D

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43. The contrapositive of the statement " If $\vec{a} = \vec{0}$ or $\vec{b} = \vec{0}$ then $\vec{a} \times \vec{b} = \vec{0}$ " is

A. If $\vec{a} \times \vec{b} \neq \vec{0}$ then $\vec{a} \neq \vec{0}$ or $\vec{b} \neq \vec{0}$

B. If $\vec{a} \times \vec{b} = 0$ then $\vec{a} = 0$ or $\vec{b} = \vec{0}$

C. If $\vec{a} \neq \vec{0}$ and $\vec{a} \neq \vec{0}$ then $\vec{a} \times \vec{b} \neq \vec{0}$

D. If $\vec{a} \times \vec{b}$ then $\vec{a} \neq \vec{0}$ then $\vec{b} \neq \vec{0}$

Answer: D

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44. The inverse of the statement " If $\vec{a} = \vec{0}$ or $\vec{b} = \vec{0}$ then $\vec{a} \times \vec{b} = \vec{0}$ is

A. If $\vec{a} \neq \vec{0}$ or $\vec{b} \neq \vec{0}$ then $\vec{a} \times \vec{b} \neq \vec{0}$

B. If $\vec{a} \times \vec{b} \neq \vec{0}$ then $\vec{a} \neq \vec{0}$ or $\vec{b} \neq 0$

C. If $\vec{a} \neq \vec{0}$ and $\vec{b} \neq \vec{0}$ then $\vec{a} \times \vec{b} \neq 0$

D. If $\vec{a} \times \vec{b} = \vec{0}$ then $\vec{a} \neq \vec{0}$ or $\vec{b} \neq \vec{0}$

Answer: C

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45. The negation of the statement " If $A.B = 0$ then $A = 0$ or $B = 0$ (where A and B are square matrices) is

A. If $A.B \neq 0 then$(A ne 0 or B ne 0)`

B. $A.\ B = 0 but$(A ne 0 and B ne 0)`

C. If $A.\ B \neq 0$ then $(A \neq 0 \text{ and } B \neq 0)$

D. $A.\ B \neq 0$ but $(A \neq 0 \text{ or } B \neq 0)$

Answer: B

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46. The logically equivalent statement of $\sim(p \wedge \sim q)$ is

A. $p \wedge q$

B. $p \vee q$

C. $\sim p \vee q$

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

Answer: C

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47. Negation of the statement $\sim p \rightarrow (q \vee r)$ is

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

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

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

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

Answer: C

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48. The false statement in the following is

A. $\sim p \wedge (\sim p)$ is a contradiction

B. `(p to q) harr (q to p) is a contradiction

C. $\sim(\sim p) \leftrightarrow p$ is a tautology

D. $p \vee (\sim p)$ is a tautology

Answer: B

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49. The compound statement $(p \wedge q) \rightarrow (p \vee q)$ is

A. a tautology

B. contradiction

C. neither option 1 nor option 2

D. both option 1 and option 2

Answer: A

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50. $(t \wedge p) \leftrightarrow p$, where t is a tautology, is

A. a tautology

B. contradiction

C. both tautology and contradiction

D. neither tautology nor contradiction

Answer: A

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51. $(c \wedge p) \leftrightarrow c$, where c is a contradiction is

A. a tautology

B. contradiction

C. neither tautology nor contradiction

D. both tautology and contradiction

Answer: A

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52. The contrapositive of the statement `p to (~q to ~r) is

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

B. `(~q ^^ r) to ~p

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

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

Answer: A

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53. If $x = 4$ and $y = -3$, then $2x - y = 11$.

The contrapositive of this statement is

A. If $2x - y \neq 11$ then $x \neq 4$ or $y \neq 3$

B. If $2x - y = 11$ then $x \neq 4$ or $y \neq 3$

C. If $2x - y \neq 11$ then $x = 4$ or $y = -3$

D. If $2x - y = 11$ then $xn = 4$ or $y = -3$

Answer: A

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54. Negation of the statement `p t (q ^^ r) is

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

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

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

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

Answer: D

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

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

B. $(\sim o \vee q) \rightarrow \sim r$

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

D. none of these

Answer: B

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56. If p and q be two statement, then the Bioconditional statement $p \Leftrightarrow q$ is true only when :

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

B. $(p \to q) vess (q \to p)$

C. $(p \wedge q) \to (pvessq)$

D. $(p \wedge q) vess (pvessq)$

Answer: A

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57. Which of the following is true for the proposition p and q?

A. $p \wedge q$ is true when atleast one of p and q is true

B. $p \rightarrow q$ is true when p is true and q is false

C. $p \leftrightarrow q$ is true only when both p and q are true

D. `~(p ^^ q) is true only when both p and q are false

Answer: D

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58. 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 a ellipse

D. A circle is an ellipse

Answer: C

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59. The negation of the statement ' 7 is greater is 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

Answer: B

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60. 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

Answer: A

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61. The negation of the statement ' plants take in co_2 and give `o_(2)' is

A. plants donot take in co2 and do not give out o2

B. plants donot take in co2 or do not give out o2

C. plants take in co2 and go not give out o2

D. plants take in co2 and donot give out o2

Answer: B

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62. The negation of the statement ' Rajesh or Rajni lived in Banglore' is

A. Rajesh did not live in Banglore or Rajini lives in Banglore

B. Rajesh lives in Banglore and Rajni did not live in Banglore

C. Rajesh did not live in Banglore and Rajni did not live in Banglore

D. Rajesh did not live in Banglore or Rajni did not live in Banglore

Answer: C

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63. The contrapositive 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

Answer: C

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64. The converse of the statement , "If $x \geq ythenx + a \geq y + a$' is

A. If $x \leq y$ then $x + a \leq y + a$

B. If $x + a \geq y + a$ then $x \geq y$

C. If $x \leq y$ then $x + a \geq y + a$

D. If $x \geq y$ then $x + a \leq y + a$

Answer: B

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65. The statement ' If x ^ 2 is not even then x is not even ' converse is

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

Answer: B

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66. Which of the following is not a proposition?

A. 3 is prime

B. 'sqrt{2}' is a irrational

C. Mathematics is interesting

D. 5 is an even integer

Answer: C

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67. Let p be the proposition "mathematics is interesting" and q be the proposition "mathematics is difficult' then the symbol of $p \wedge q$ means

A. Mathematics is interesting and Mathematics is difficult

B. Mathematics is interesting but it is difficult

C. Mathematics is interesting implies and is implied by mathematics is difficult

D. Mathematics is interesting implies mathematics is difficult

Answer: B

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68. Which of the following is always true?

A. $(p \to q) \equiv \sim q \to \sim p$

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

C. $\sim(p \to q) \equiv p \vee \sim q$

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

Answer: A

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69. The logically equivalent statement of $p \leftrightarrow q$ is

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

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

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

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

Answer: B

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70. $\sim p \wedge q$ is logically equivalent to ...

A. p rarr q'

B. $q \rightarrow p$

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

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

Answer: D

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71. If p $\rightarrow (q \vee r)$ is false then the truth values of p, q, and 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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72. If $p \to (\sim p \vee q)$ is false then the truth values of p and q are respectively

A. F, F

B. F, T

C. T, F

D. T, T

Answer: C

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73. "The diagonals of a rhombus are perpendicular". The contrapositive of this statement is

A. If the figure is not a rhombus, then its diagonals are not perpendicular

B. If the diagonals are perpendicular, then the figure is a rhombus

C. If the diagonals are not perpendicular then the figure is a rhombus

D. If the diagonals are not perpendicular, then the figure is not a rhombus

Answer: D

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74. The contrapositive of $(p \vee q)$ rarr r is

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

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

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

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

Answer: C

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75. p and q are two propositions. Then the contrapositive of the implication $p \rightarrow q$ is

A. $q \rightarrow p$

B. $p \leftrightarrow p$

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

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

Answer: C

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76. Which of the following is the inverse of the proposition: "If a number is a prime then it is odd"?

A. If a number is not a prime then it is odd

B. If a number is not a prime then its is not odd

C. If a number is not odd then it is not a prime

D. If a number is odd then it is a prime

Answer: B

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77. The contrapositive of "If two triangles are identical then these are ~ilar" is

A. If two triangles are not identical then these are ~ilar

B. If two triangles are not ~ilar then these are identical

C. If two triangles are not ~ilar then these are not identical

D. If two triangles arc not identical then these are not ~ilar

Answer: C

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

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

B. $\sim p \rightarrow \sim q$

C. $\sim q \rightarrow p$

D. $p \rightarrow q$

Answer: C

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79. The converse of the contrapositive $p \rightarrow q$ is

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

B. $\sim q \rightarrow p$

C. $\sim p \rightarrow q$

D. $p \rightarrow \sim q$

Answer: A

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80. The negation of $q \vee \sim(p \wedge r)$ is

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

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

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

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

Answer: C

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81. The proposition $(p \rightarrow \sim p)$^^(~ p rarr p)` is a

A. tautology

B. contradiction

C. neither (a) nor (b)

D. both tautology and contradiction

Answer: B

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82. $(p \wedge \sim q) \wedge (\sim p \vee q)$ is

A. tautology

B. contradiction

C. both tautology and contradiction

D. neither a tautology nor a contradiction

Answer: B

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83. The negation of the proposition"If 2 is prime then 3 is odd" is

A. 2 is prime and 3 is not odd

B. If 2 is not prime then 3 is not odd

C. 2 is not prime and 3 is odd

D. 2 is not prime and 3 is odd

Answer: C

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84. The incorrect statement is

A. $p \rightarrow q$ is logically equivalent to $\sim p \vee q$

B. If the truth values of p, q, r are T, F, T respectively then the truth calue of $(p \vee q) \wedge (q \vee r)$ is T

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

D. The truth value of `p ^^ ~(p ^^ q) is always T

Answer: A

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85. The converse of the contrapositive of the conditional $p \rightarrow \sim q$ is

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

B. $p \rightarrow q$

C. $\sim p \rightarrow q$

D. $\sim q \rightarrow p$

Answer: C

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86. The negation of $p \wedge (q \rightarrow \sim r)$ is

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

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

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

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

Answer: B

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87. Which of the following is not true?

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

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

C. $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow p \rightarrow r$ is a tautology

D. (~p` ^^ ~ q) harr (p rarr q) is a tautology

Answer: D

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88. The negation of $p \rightarrow (\sim p \vee q)$ is

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

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

C. $p \rightarrow q$

D. $p \wedge \sim q$

Answer: D

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

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

B. $\sim p \vee q \rightarrow \sim r$

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

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

Answer: B

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90. The negation of the proposition " If a quadrilateral is a square then it is a rhombus", is

A. If a quadrilateral is not a square, then it is a rhombus

B. If a quadrilateral is a square then it is not a rhombus

C. A quadrilateral is a square and it is not a rhombus

D. A quadrilateral is not a square and it is a rhombus

Answer: C

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91. The contrapositive of the statement "if $x^2 - 1 = q0$ then $x = q - 1$ or (x=q1)` is

A. If

$$x^2 - 1 \neq q0 then x \neq q - 1 \text{ or } x \neq q1$$

B. If

$$x^2 - 1 \neq q0 then x \neq q - 1 \text{ and } x \neq q1$$

C. If

$$x \neq q - 1 \text{ or } x \neq q1 then x^2 - 1 \neq q0$$

D.

$$If x \neq q - 1 \text{ and } x \neq q1 then x^2 - 1 \neq q0$$

Answer: D

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92. It is not true that "Roses are yellow implies violets are green" The ~plified form of this statement is

A. Roses are yellow and violets are green

B. Roses are not yellow and violets are green

C. Roses are yellow and violets are not green

D. Roses are not yellow or violets are green

Answer: C

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

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

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

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

D. none of these

Answer: D

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94. Let S be a non-empty subset of R . Consider the following statement P: There is a rational number x in S such that $x > 0$ which of the following statement is the negation of the statement P.

A. Every rational number x in S satisfies $x \leq 0$

B. x in S and$x \leq 0 \rightarrow x$ is not rational

C. There is a rational number x in S such that $x \leq 0$

D. There is no rational number x in S such that $x \leq 0$

Answer: A

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95. The statement $p \to (q \to p)$ is equivalent to

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

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

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

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

Answer: D

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96. Which of the following statements is a tautology?

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

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

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

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

Answer: C

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97. $\sim(p \vee q) \vee (\sim p \wedge q)$ is logically equivalent to

A. $\sim p$

B. p

C. q

D. $\sim q$

Answer: A

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