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J.E.E. Main/ Advanced Foundation - XI Maths Worksheet

Time: $\mathbf{3 0} \mathbf{m i n}$
Chapter\#14. Mathematical Reasoning
Full Marks:
Q. 1 Using the words "necessary and sufficient" rewrite the statement "The integer n is odd if and only if $\mathrm{n}^{2}$ is odd". Also check whether the statement is true.
Q. 2 For the given statement identify the necessary and sufficient conditions : If you drive over 80 km per hour, then you will get a fine.
Q. 3 Write the converse of the following statements :
(i) If a number n is even, then $\mathrm{n}^{2}$ is even.
(ii) If you do all the exercises in the book, you get an A grade in the class.
(iii) If two integers $a$ and $b$ are such that $a>b$, then $a-b$ is always a positive integer.
Q. 4 Write the negation of the following statements :
(i) p : For every real number $\mathrm{x}, \mathrm{x}^{2}>\mathrm{x}$.
(ii) $q$ : There exist a rational number $x$ such that $x^{2}=2$.
(iii) $r$ : All students study mathematics at the elementary level.
Q. 5 Find the component statements of the following compound statements and check whether they are true or false.
(i) Number 3 is prime or it is odd.
(ii) All integers are positive or negative.
(iii) 100 is divisible by 3,11 and 5 .
Q. 6 Identify the quantifier in the following statements and write the negation of the statements.
(i) There exists a number which is equal to its square.
(ii) For every real number $\mathrm{x}, \mathrm{x}$ is less than $\mathrm{x}+1$.
(iii) There exists a capital for every state in India.
Q. $7 \quad$ Check whether the following statement is true or not.

If $x, y \in Z$ are such that $x$ and $y$ are odd, then $x y$ is odd.

