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Family name	Given name	Student number	

ENS1161 Computer Fundamentals

Test 2

10/10

(a) Let P denote a set of people, and M a set of movies, and suppose that the predicate S(x, y) means that person x has seen movie y.

(i) Write the following statement in symbols:

For each movie there is somebody who has not seen it.

$\forall y \in M, \exists x\ P, \sim S(x, y)$ ✓

(ii) Write the following statement in symbols:

There is some movie that at least one person has not seen.

$\exists y \in M, \exists x\ P, \sim S(x, y)$ ✓

(iii) Write the negation of the statement in (i) in **simple** English.

$\exists y \in M, \forall x\ P, S(x, y)$
There is some movie that everybody has seen ✓

(iv) Write the negation of the statement in (ii) in **simple** English.

$\forall y \in M, \forall x\ P, S(x, y)$
Everybody has seen all the movies ✓

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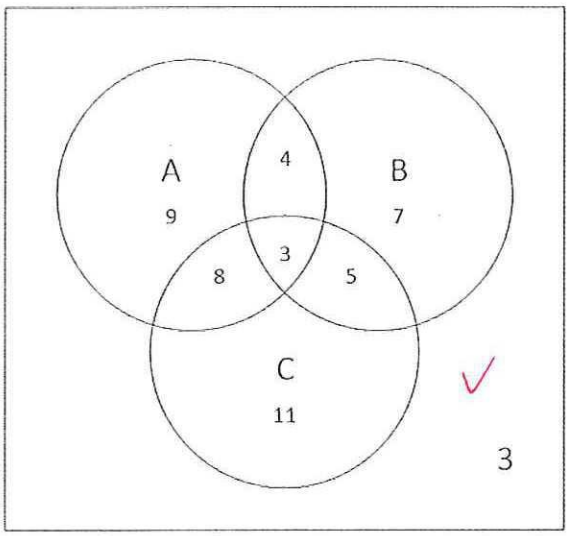
(b) Consider three subsets A, B and C of a universal set U. Given that n(U) = 50, n(A) = 24, n(B) = 19, n(C) = 27, n(A∩B) = 7, n(A∩C) = 11, n(B∩C) = 8 and n(A'∩B'∩C') = 3, find:

(i) $n(A \cap B \cap C') = 4$ ✓
(ii) $n((A \cap B) \cup (A \cap C)) = 15$ ✓
(iii) $n(A' \cap B' \cap C = 11$ ✓



✓

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[6 + 4 = 10 marks]