GROUP A

NOVEMBER 2019
EBS 101
ELEMENTARY ALGEBRA

30 MINUTES

CANDIDATE'S INDEX NUMBER:
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SIGNATURE:

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH

INSTITUTE OF EDUCATION

FOUR YEAR BED -SECOND YEAR FIRST SEMESTER

ZONAL-BASED QUIZ 1 (EGA)

ANSWER ALL QUESTIONS

11/20

FIRST YEAR, FIRST SEMESTER QUIZ 1, NOVEMBER 2019

Answer ALL the questions showing clearly all workings in the spaces provided. (20 marks)

1. Two binary operations $\otimes$ and $*$ are defined on the set $\square$ of real numbers by

$m \otimes n = m + n - 2$ and $p * q = pq + 5$

Evaluate (i) $3 \otimes (2 * 4)$ [4 marks]

Solution

By the definition

$m \otimes n = m + n - 2$ and $p * q = pq + 5$

~~$m \otimes n = m + n - 2$~~ ~~$3 \otimes (2 * 4)$~~

~~$3 \otimes (2 * 4)$~~

Solving the bracket first $\Leftarrow 3 \otimes (2 * 4)$

$(2 * 4) = 2(4) + 5$ M1

$= 8 + 5$

$= 13$ A1

$3 \Delta (13) = m + n - 2$

$= 3 + 13 - 2$ M1

$= 16 - 2$

$3 \Delta (2 * 4) = 14$ A1

(ii) $(3 \otimes 2) * (3 \otimes 4)$ [4 marks]

By the definition $m \otimes n = m + n - 2$

$(3 \underset{LHS}{\otimes} 2) * (3 \underset{RHS}{\otimes} 4)$

LHS first $= 3 + 2 - 2$ * B1

$\therefore (3 \otimes 2) = 3$ *

$\therefore (3 \otimes 2) = 3 * (3 \otimes 4)$

Solving RHS $3 \otimes 4$

$3 \otimes 4 = 3 + 4 - 2$

$= 3 + 2$

$\therefore (3 \otimes 4) = 5$ B1

By definition $p * q = pq + 5$

$3 * 5 = 3(5) + 5$ M1

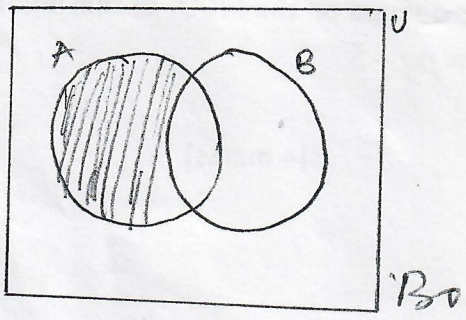
$= 15 + 5$

$= 20$

$\therefore (3 \otimes 2) * (3 \otimes 4) = 20$ A1

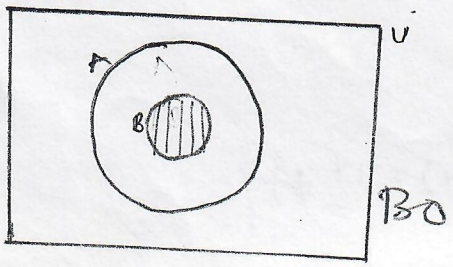
2. Let A and B be subsets of the universal set U, represent the following using the Venn diagram

(i) $(A' \cap B)$ [3 marks]



B0

(Ii) $A \cup B'$ [3 marks]



B0

3. If n(A - B) = 18, n(A ∪ B) = 70 and n(A ∩ B) = 25, then find n(B) [6 marks]

Solution

~~Let n(A-B) be~~

Let $n(A-B) = x$

Let $n(A \cup B) = 70$

Let $n(A \cap B) = 25$

To find $(A-B) = *$

$= 25 - x = 70$

$= -x = 70 - 25$

To find $n(A-B) = x - 25 = 70$

$* x + 25 = 70$

$= x = 70 - 25$

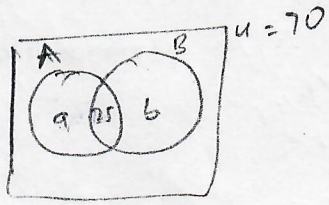
$= x = 45$

So $n(A-B) = 45$

To find A let x be

$A+B=70$

$18+nB+15=70$



If $a-b=18$

$\frac{18}{25}$

$\frac{}{42}$

$A-B=18$ 45

RTO