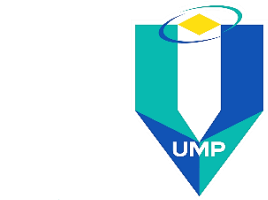


ASSIGNMENT

BUM1233
DISCRETE MATHEMATICS AND APPLICATIONS

NAME	ID NO.	SECTION
1. MUHAMMAD ARIF BIN AZLAN	CB22085	02P
2. AHMAD IQBAL HAMDI BIN AHMAD FAUZI	CB22113	02P
3. MUHAMMAD AMIRUL AIQAL BIN ZULGHAFARALISADIKIN	CB22046	02P
4. MUHAMMAD AMIRUL AIMAN BIN ISMAIL	CB22002	02P

LECTURER'S NAME
MADAM INTAN SABARIAH BINTI SABRI

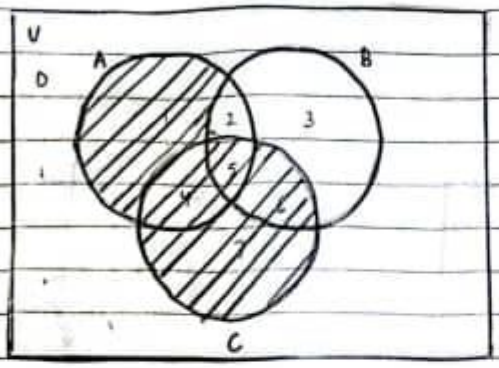
Question	FOR EXAMINER USE ONLY
	Marks
PART A	
1	/4
2	/5
3	/21
PART B	
	/30
Total marks	/60

No.:

PART A

Question 1

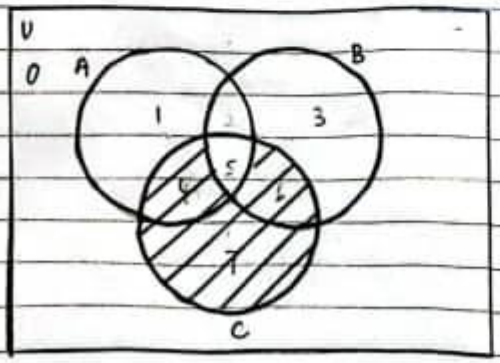
i) $(A \cap \bar{B}) \cup C$



$A \cap \bar{B} = \{1,2,4,5\} \cap \{0,1,4,7\}$
$= \{1,4\}$

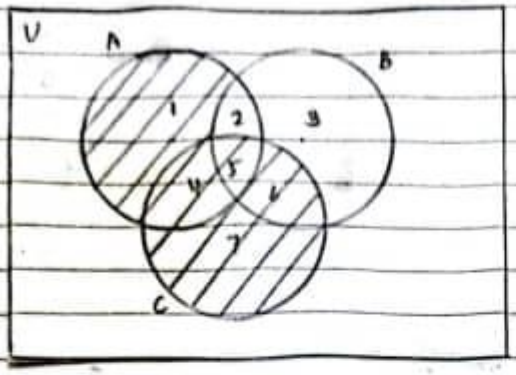
$(A \cap \bar{B}) \cup C = \{1,4\} \cup \{4,5,6,7\}$
$= \{1,4,5,6,7\}$

ii) $(A \cup C) \cap [C - (A \cap B)]$



$A \cup C = \{1,2,4,5,6,7\}$
$A \cap B = \{2,5\}$
$C - (A \cap B) = \{4,6,7\}$
$(A \cup C) \cap [C - (A \cap B)] = \{1,2,4,5,6,7\} \cap \{4,6,7\}$
$= \{4,6,7\}$

iii) $(A \cup C) - [(A \cap B) - C]$



$A \cup C = \{1,2,4,5,6,7\}$

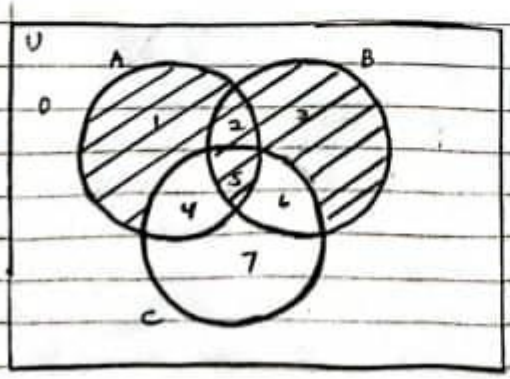
$A \cap B = \{2,5\}$

$(A \cap B) - C = \{2\}$

$(A \cup C) - [(A \cap B) - C] = \{1,2,4,5,6,7\} - \{2\}$

$= \{1,4,5,6,7\}$

iv) $[(A \cup B) \cap \bar{C}] \cup (A \cap B \cap C)$



$A \cup B = \{1,2,3,4,5,6\}$

$[(A \cup B) \cap \bar{C}] = \{1,2,3,4,5,6\} \cap \{0,1,2,3\}$

$= \{1,2,3\}$

$A \cap B \cap C = \{5\}$

$[(A \cup B) \cap \bar{C}] \cup (A \cap B \cap C) = \{1,2,3,5\}$

Question 2

i) $R_1 = \{-1, 0, 1\}$ $R_2 = \{-2, -1, 0, 1, 2\}$

$R_1 \times R_2$

$= \{(-1,-2), (-1,1), (-1,0), (-1,1), (-1,2), (0,-2), (0,-1),$
$(0,0), (0,1), (0,2), (1,-2), (1,-1), (1,0), (1,1), (1,2)\}$

ii) $P(R_2) = \{\emptyset, \{-2\}, \{-1\}, \{0\}, \{1\}, \{2\}, \{-2,-1\}, \{-2,0\},$
$\{-2,1\}, \{-2,2\}, \{-1,0\}, \{-1,1\}, \{-1,2\}, \{0,1\}, \{0,2\},$
$\{1,2\}, \{-2,-1,0\}, \{-2,-1,1\}, \{-2,-1,2\}, \{-2,0,1\},$
$\{-2,0,2\}, \{-2,1,2\}, \{-1,0,1\}, \{-1,0,2\}, \{-1,1,2\},$
$\{0,1,2\}, \{-2,-1,0,1\}, \{-2,-1,0,2\}, \{-2,-1,1,2\},$
$\{-2,0,1,2\}, \{-1,0,1,2\}, \{-2,-1,0,1,2\}\}$

iii) $\bigcap_{i=1}^{10} R_i$

i=1 $R_1 = \{-1, 0, 1\}$

i=2 $R_2 = \{-2, -1, 0, 1, 2\}$

$\vdots$

i=10 $R_{10} = \{-10, \ldots, -1, 0, 1, \ldots, 10\}$

$\therefore \bigcap_{i=1}^{10} R_i = \{-1, 0, 1\}$

No.: Date:

Question 3.

(a) If there is flood mitry in this week, then today is a strong windd and heavy rain.
If today there is no strong wind, then today is no heavy rain.
Today is a heavy rain and there is no flood mitry in this week.
Therefore, today is a heavy rain.

① $p \rightarrow q \wedge r$
② $\sim q \rightarrow \sim r$
③ $r \wedge \sim p$
④ $\therefore r$

				①			②		③	④
p	q	r	$q \wedge r$	$p \rightarrow q \wedge r$	$\sim q$	$\sim r$	$\sim q \rightarrow \sim r$	$\sim p$	$r \wedge \sim p$	r
T	T	T	T	T	F	F	T	F	F	T
T	T	F	F	F	F	T	T	F	F	F
T	F	T	F	F	T	F	F	F	F	T
T	F	F	F	F	T	T	T	F	F	F
F	T	T	T	(T)	F	F	(T)	T	(T)	(T)
F	T	F	F	T	F	T	T	T	F	F
F	F	T	F	T	T	F	F	T	T	T
F	F	F	F	T	T	T	T	T	F	F

∴ The metrologist's forecast is valid.

No. Date:

Question 3B

suppose a veterinarian claims that,

line 1 If an animal is cold blooded, then it is not a mammale.
line 2 If animal cannot fly, then it is ~~mama~~ mammal
line 3 cat is warm blooded and cannot fly
line 4 As a conclusion, cat is a mammal.

Determine the validity of the veterinarian claims by using truth table.

line 1 : $P \rightarrow \sim Q$
line 2 : $\sim R \rightarrow Q$
line 3 : $(\sim P \wedge \sim R)$
line 4 : ~~R~~ Q

P	Q	R	~Q	P→~Q	~R	~R→Q	~P	(~P^~R)	Q
T	T	T	F	F	F	T	F	F	T
T	T	F	F	F	T	T	F	F	T
T	F	T	T	T	F	T	F	F	F
T	F	F	T	T	T	F	F	F	F
F	T	T	F	T	F	T	T	F	T
F	T	F	F	(T)	T	(T)	T	(T)	(T)
F	F	T	T	T	F	T	T	F	F
F	F	F	T	T	T	F	T	T	F

critical row

∴ Veterinarian's claim is valid

No:

Question 3C

Based on (a) and (b), determine whether compound proposition are logically equivalence

the compound proposition for both (a) and (b) are logically equivalence ✗