

NATIONAL UNIVERSITY OF SINGAPORE

CS1231 – Discrete Structures

(Semester 1: AY2018/19)

ANSWER SHEETS

Time Allowed: 2 Hours

INSTRUCTIONS TO CANDIDATES

1. These Answer Sheets consist of **FIVE (5)** printed pages.
2. Fill in your **Student Number** clearly below with a pen. **Do NOT write your name.**
3. You may write your answers in pencil.

STUDENT NUMBER:

A									
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(Write your Student Number above legibly with a pen.)

FOR EXAMINER'S USE ONLY		
Questions	Max.	Marks
MCQs (Q1-15)	30	
Q16	14	
Q17	14	
Q18	12	
Total	70	

Section B (40 marks)

Q16.

[14 marks]

(a)
[2]



(b)
[2]



(c)
[2]

How many slips have a 2 written on them?

(d) i.
[2]

Probability of getting a head.

ii.
[2]

Probability that coin is two-headed.

(e).
[4]

Pigeonhole Principle

Q16:

/14



Q17.

(a) Express $E(n)$ in terms of $V_3(n)$ and $V_4(n)$.
[2]

(b) Recurrence relation for $V(n)$ for $n > 0$.
[2]

(c) Closed form formula for $V(n)$ for $n \geq 0$.
[2]

(d) Recurrence relation for $E(n)$ for $n > 0$.
[2]

(e) Closed form formula for $E(n)$ for $n \geq 0$.
[2]

(f) Relate v , e and f in Euler's formula $v - e + f = 2$ with the functions defined in this question.
[2]

(g) Closed form formula for $P(n)$ for $n \geq 0$.
[2]

Q18.

SDN7484U

[12 marks]

(a)
[2]

Checksum letter for SCS1231.

(b)
[2]

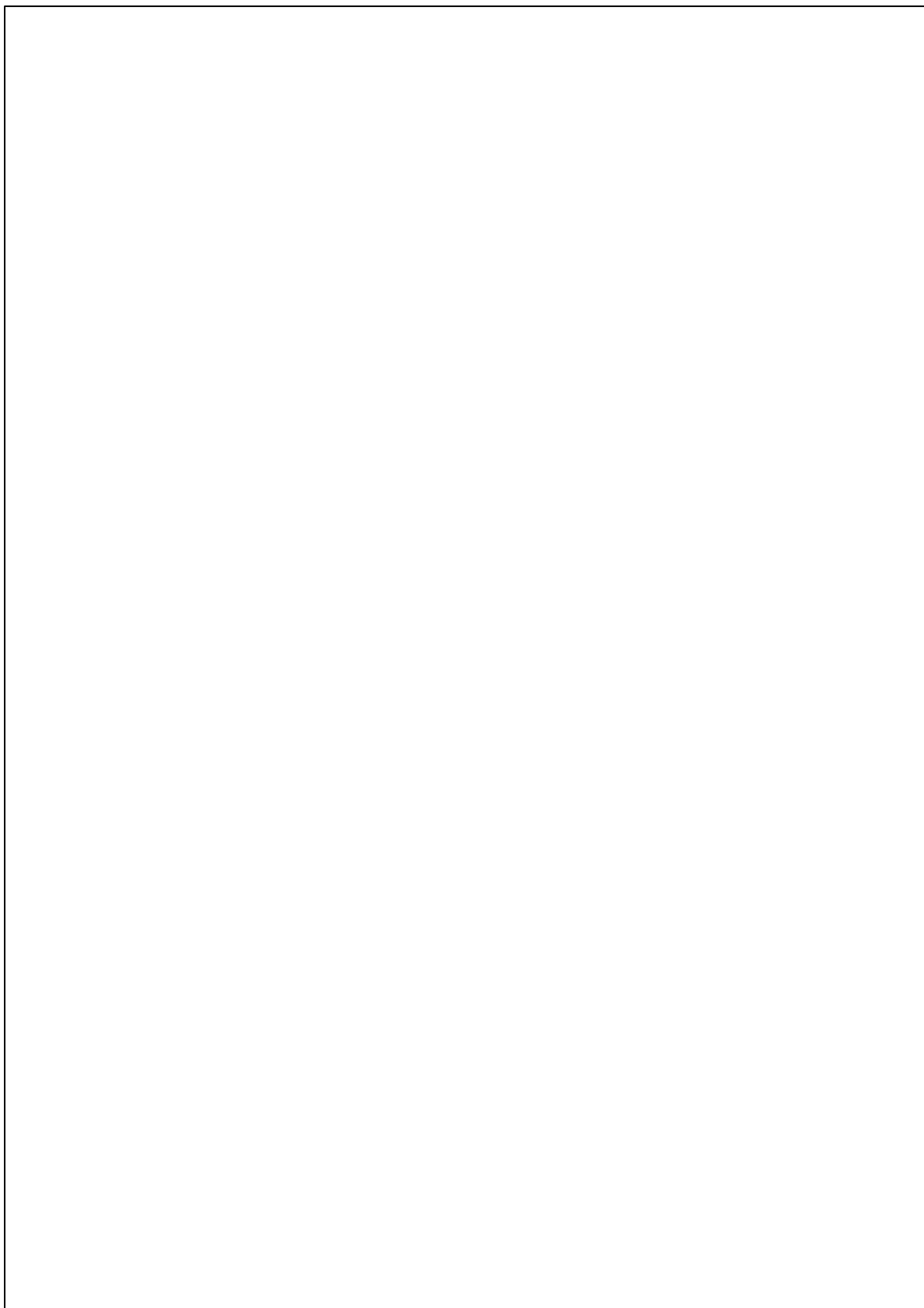
Show that f is not one-to-one.

(c)
[8]

Is f onto?

(Continue to next page if you need to.)

Q18: /12



~~~ END OF PAPER ~~~

Q18: /12