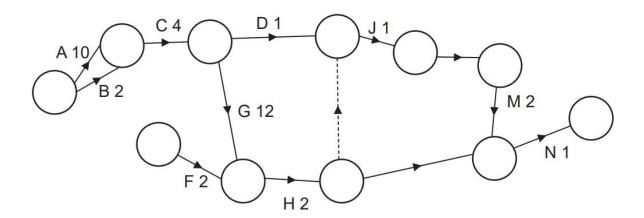# Question 13 (12 marks)

A kitchen renovation project consists of a number of tasks of different durations and completed in different orders. One such renovation has this information summarised in the table below.

Task	Task description	Duration (days)	Immediate predecessor(s)
A	Prepare plans	10	None
B	Select contractor	2	None
C	Review plans	4	A, B
D	Purchase appliances	1	C
E	Remove old appliances and benches	2	C
F	Prepare electrics and plumbing	2	E
G	Construct new cupboards and benches	12	C
H	Install cupboards and benches	2	F, G
J	Install appliances	1	see part (b)
K	Tiling and splashbacks	5	J
L	Flooring	3	H
M	Complete electrical and plumbing	2	K
N	Test and handover	1	L, M

A partially-completed project network is shown below for this table.

(a)   Complete the network diagram.   (2 marks)

(b)   Identify the immediate predecessor(s) of Task J.   (1 mark)

(c)   What does the dotted line on the network indicate?   (1 mark)

(d)   Determine the critical path and the minimum completion time for the project.   (2 marks)

(e)   Determine the float time for Task D and explain its meaning in terms of the renovation.
                                                                                                    (2 marks)

(f)   Once Task E (removal of old appliances and benches) begins, the kitchen cannot be used. What is the least amount of time the occupants of the house will be without a working kitchen?   (1 mark)

(g)   If Task G was actually completed in nine days, how would this affect the critical path and minimum completion time?   (2 marks)

Tasks E and F are both delayed.

(h)   What is the maximum possible delay that does **not** affect the original minimum
       completion time?   (1 mark)