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Section II

Question 21

(a) (i) NumberOfTrains = 0

Train # = 123456..... Infinite loop

NumberOfTrains = 1

Train = 1 - Program ends without locating the train

NumberOfTrains = 2

Train = 12 - Program ends before locating the second train.

- When run, X and Y are undefined in ReadLocation, and it does not return any value. In DisplayTrainID X and Y are undefined, and so it does not display.

(ii) When the number of trains is entered as 0, the program, rather than quitting, loops indefinitely. It repeatedly calls the ReadTrainID, ReadLocation and DisplayTrainID modules despite the fact that the user entered a value of no trains. This is because the program will loop while Train does not equal NumberOfTrains, and since Train is assigned the value of 1 in line 3 and incremented in line 8, it will never become equal. Thus the program loops indefinitely.

When the number of trains is entered as 1, the pre-test WHILE loop condition is broken immediately, as it reaches equality with Trains, and so the loop is bypassed immediately, and the program quits without displaying the location

BOARD OF STUDIES
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of the train.

When the NumberOfTrains is entered as 2, the loop proceeds once, but then the value of train is incremented and now equals the NumberOfTrains. Thus, the condition for the WHILE loop is broken and the program quits, without processing the second train as required.

(iii) Line 4 should be changed to:

~~WHILE (Train <> 0) AND (Train <= NumberOfTrains)~~
~~With this modification, the program loops as desired~~
~~WHILE (NumberOfTrains <> 0) AND (Train <= Num~~

WHILE Train <= NumberOfTrains

Thus, if Number of Trains is entered as 0, the condition is immediately broken and the loop, and program, terminates. The inclusion of the equality into the condition means that the program will loop for the desired number of trains, rather than quitting before processing the final train.

Also, there are problems with the ReadLocation module. Line 14 should be executed first, followed by line 15. Then, lines 12 and 13 should follow, but the assignment statements

need to be reversed. So they will now read:

LocationX = X

and LocationY = Y.

The DisplayTank10 also has problems, in that line 18 refers to undefined variables in that module. It should read:

display Tank10 at LocationX, LocationY

b)

i) The member may be violating copyright because they are using code which is intellectual property owned by another person. It is plagiarism because they are passing the code off as their own. The owner should be contacted to gain permission and see whether they require acknowledgement because this is not being given because the member is not giving the website address or details of who actually wrote the code.

ii) The management could develop a code of conduct which the developers could agree to abide by and suffer consequences for infringements. The code would cover responsibilities such as those pertaining to copyright & the need to acknowledge the use of others work, commitment to

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produce quality software that is reliable, respond to problems and prevent the spread of viruses. The management could also inform them of their rights such as authorship that are in conjunction with these responsibilities