2023_PET328_Test1_Solution

May 16, 2023

[1]:
```
print('... to the only wise God')
```

```
… to the only wise God
```

1 Question 1

1.0.1 Input statements

[8]:
```
# 1 mark for 'input'
# 1 mark for 'float'

c_f = input("What is the conversion factor?\n")
perm = float(input("What is the value of permeability?\n"))
area = float(input("What is the value of flow area?\n"))
press_in = float(input("What is the value of inlet pressure?\n"))
press_out = float(input("What is the value of outlet pressure?\n"))
visc = float(input("What is the value of fluid viscosity?\n"))
length = float(input("What is the value of length of flow interval?\n"))
threshold = float(input("What is the rate economic threshold?\n"))       # 1␣
↪mark (extra-point question)
```

```
What is the conversion factor?
default
What is the value of permeability?
30
What is the value of flow area?
2.5
What is the value of inlet pressure?
4000
What is the value of outlet pressure?
3500
What is the value of fluid viscosity?
1
What is the value of length of flow interval?
4
What is the rate economic threshold?
50
```

1.0.2 Conditional structure to resolve the conversion factor

[9]:
```
if c_f == "default":      # 1 mark
    c_f = 0.001127        # 1/2 mark
else:
    c_f = float(c_f)      # 1/2 mark

print(c_f)
```

```
0.001127
```

1.0.3 Flowrate computation

[10]:
```
rate = (c_f*perm*area*(press_in - press_out))/(visc*length)    # 1 mark

# Round rate to 2 decimal places
rate = round(rate, 2)
```

1.0.4 Communicating the output

[11]:
```
print("The flow rate is ", rate, 'STB/D')      1 mark
```

```
The flow rate is  10.57 STB/D
```

1.0.5 Communicating the output - extra-point question

[12]:
```
if rate > threshold:      # 1/2 mark
    print("Rate above economic threshold")    # 1/2 mark
else:
    print("Rate below economic threshold")
```

```
Rate below economic threshold
```

2 Qustion 2

i. The *for* loop in Line 25 [**1 mark**]

ii. The addition of 1 is to ensure Function *range* gives a series of numbers that stops at the intended number of blocks. Function *range*, by default stops one short of the second arguement. [**1 mark**]

iii. The porosity value is requested in the *for* loops because the value varies across the rows and columns. It could be requested outside the loops only if a single porosity value applies to all rows and all columns. [**1 mark**]

[1]:
```
# iv.
#Initializing 'total_stoiip'
total_stoiip = 0       # 1 mark
```

[ ]:
```

```