Midterm Exam

Q 1)

a. Write a piece of program to print the odd numbers between \(i\) and \(j\). Assume \(i\) and \(j\) are integers, and \(i\) is odd number. 

\[
\text{Character}(3) :: \text{NAME}
\]
\[
\text{INTEGER} :: A
\]
\[
\text{REAL} :: B, C
\]
\[
\text{NAME} = \text{Saed Aldeen}; \quad B = 5.747; \quad C = -25.056; \quad A = -363
\]
\[
\text{PRINT} 10, A, B, C, \text{NAME}
\]
\[
10 \text{ FORMAT } (3X, I3, 3X, E11.3//1X, F5.1, 3X, A11)
\]

b. Write the printed result of the following FORTRAN statements: 

(2 Points)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>Total</td>
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</tbody>
</table>

c. Find errors in the following statements and correct it. 

(3 Points)

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>Errors</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF(K = 2 . OR . NE. 0) L = L**2</td>
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<tr>
<td>V = 3.89 = X**8.67 + SIN X</td>
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<tr>
<td>E = (1/2R)( 5**2(K+1))</td>
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</tbody>
</table>

d. How many times the print statement will be executed. 

(2 Points)

| do k = 1,27                  | do i = 1,5 |
| print *, k                   | do j = 5,25,5 |
| if(k.gt.19) exit             | print *, i*j |
| end do                       | end do |

| NO. OF TIMES= | NO. OF TIMES= |
Q2) Follow the Execution of the Following Program and Print Out the Results

```
INTEGER::K,L,I,J
DO  J=1,2
    READ*,K,L
    DO  I=7,1,-6
        K=K+I/J
        IF( MOD(K,3) == 2 .OR. J/I .NE. 0 ) L=L**2
        K=K+L
        IF(K.LE.7 .AND. L.LE. 5) THEN
            PRINT 5,K,L,I
        ELSE IF (K.GT. 7 .AND. L.GT. 5) THEN
            PRINT 5, L, I, J
            FORMAT(1X,3(2X,I2))
        ELSE
            PRINT 5, K, L, I
        END IF
    END DO
    PRINT*, 'STEP J= ', J
END DO
STOP
END
```

Input Data

```
4  -2  
5  -1
```

<table>
<thead>
<tr>
<th>J</th>
<th>K</th>
<th>L</th>
<th>I</th>
</tr>
</thead>
<tbody>
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</table>

PRINT OUT
Q3) Consider the following equations: 

\[ e^{-\alpha} \quad \text{for} \quad |\alpha| > 1 \]

\[ \beta = \begin{cases} 
\frac{a}{\sqrt{(a-1)(a+1)}} & \text{for} \quad -1 < a < 1 \\
0 & \text{other cases}
\end{cases} \]

\( \beta \) is not defined when \( \alpha = 1 \) or \(-1\).

Write a FORTAN90 program that performs the following:
1. Read in free format the real number \( \alpha \)
2. Calculate and print the real number \( \beta \) in free format
3. When \( \alpha = 1 \) or \(-1\) the program should print the message "Not defined"

N.B. Use IF-ELSEIF statement only.