# Midterm EXIMANATION

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<th>Question#</th>
<th>Mark</th>
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King Saud University  
College Of Engineering  
Department Of Chemical Engineering  
GE 209 Computer Programming  
2nd Semester 1428/1429 H  
Time Allowed: 1:15 Hours
QUESTION (1)

(1)

Draw CIRCLE around the right answer:

(i)

```fortran
REAL:: A,B
A=37.555
B=5.2813
PRINT 10, A, B
10 FORMAT (1X,2E15.7)
STOP
END
```

The right print out is:
(a) \(0.3755500E+02\) \(0.5281300E+01\)
(b) \(0.3755500E+02\) \(0.5281300E+01\)
(c) \(0.3755500E+02\) \(0.5281300E+01\)
(d) \(0.3755500E+02\) \(0.5281300E+01\)

\(X = \left( \log\left| e^{-x} \right| \right) \left( \log \frac{1.0}{\sqrt{\cos y}} \right)\)

The correct Fortran expression is:
(a) \(X=(\log(\text{abs}(\exp(-X))))*(\log(\text{abs}(1.0/\sqrt{\cos(y)})))\)
(b) \(X=(\log(\text{abs}(\exp(-X))))*(\log(\text{abs}(1.0/\sqrt{\cos(y)})))\)
(c) \(X=(\log(\text{abs}(\exp(-X))))*(\log(\text{abs}(1.0/\sqrt{\cos(y)})))\)
(d) \(X=(\log(\text{abs}(\exp(-X))))*(\log(\text{abs}(1.0/\sqrt{\cos(y)})))\)

(ii)

<table>
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<tr>
<th>GIVEN</th>
<th>LOGICAL EXPRESSION</th>
<th>OUTCOME</th>
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<tbody>
<tr>
<td>Logical Flag</td>
<td>A+B.LE.20.0.OR.Flag.EQV..False.</td>
<td>(a)True</td>
</tr>
<tr>
<td>Real:: A, B</td>
<td>Parameter (A=16.0, B=5.0)</td>
<td>(b)False</td>
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<tr>
<td>Flag=A.GT.B</td>
<td></td>
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<tr>
<td>Logical Flag</td>
<td>B**2.LE.16.0.OR.Flag.NEQV..True.</td>
<td>(a)True</td>
</tr>
<tr>
<td>Real:: A, B</td>
<td>Parameter (A=16.0, B=5.0)</td>
<td>(b)False</td>
</tr>
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<td>Flag=Sqrt(A).LE.B</td>
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(iii)

```fortran
SUM=0.0
N=1
10 SUM=SUM+N
N=N+1
IF(N.EQ.2) SUM=3
IF(N.LT.3) GOTO 10
PRINT *, N, SUM
STOP
END
```

The right print out is:
(a) 3 3.000000
(b) 3 4.000000
(c) 3 5.000000
(d) Syntax Error

The right print out is:
(a) N=1
(b) N=-1
(c) N=0
(d) Syntax Error
**QUESTION (2)**
Trace this program showing all results and printed outputs.

```fortran
IMPLICIT NONE

LOGICAL:: DIS
INTEGER::M=7
REAL, PARAMETER:: B=5.
REAL ::Y,S,Z

DO Y=1,13,6
   S=Y+M/2
   DIS= B .GE. S
   IF (DIS .EQV. .True.) THEN
      Z=B-M
      PRINT *, Y, Z
   ELSE
      IF ( Y+M .LE. 19. .OR. B .GE. 20.) THEN
         Z=MIN(Y,B)
         PRINT *,Y,Z
      ELSE
         PRINT *, 'Invalid Y'
         STOP
      ENDIF
   ENDIF
   PRINT *, Z
ENDDO
PRINT*,Y,Z
END
```

Print out

<table>
<thead>
<tr>
<th>DIS</th>
<th>M</th>
<th>B</th>
<th>Y</th>
<th>S</th>
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Print out DIS M B Y S Z
QUESTION (3)

The cost per kilometer for a rented car is

0.5 SR/km for the first 100 Kilometer, 
0.3 SR/km for the next 200 Kilometer, and 
0.2 SR/km for all kilometers in excess of 300 km.

(For example, the cost for the case 150 km is (100*0.5+(150-100)*0.3), for 480 km is (100*0.5+ 200*0.3+(480-300)*0.2), and so on)

Write a FORTRAN program:

(a) Reads the kilometers traveled
(b) Determines the total cost using (if-else-if statement.
(c) Determines the average cost per km.