课程目标 1 (权重___)	课程目标 2 (权重___)	课程目标 3 (权重___)	课程目标 4 (权重___)	课程目标 5 (权重___)	课程目标 6 (权重___)	综合成绩 (目标数可增删)

安徽大学电气工程及自动化学院本科实验报告

【课程名称】 ___Matlab程序设计___

【课程目标】 （依据教学大纲）

【实验名称】 ___Matlab环境和函数___

【实验目的】

1. 练习掌握MATLAB实用教程（第二版）书中第二至三章函数

【实验原理及方法】

1. 使用MATLAB或Octave软件完成书上习题

【实验内容及过程】

- 内容：

书上2.1, 2.2, 2.3,2.4, 2.7,2.11, 2.15, 2.16, 2.17, 3.1, 3.2, 3.4, 3.8, 3.9, 3.10, 3.13, 3.14, 3.15, 3.17, 3.18, 3.20

- 过程

```
% 2.1
ans2_1_1= 1+3/4;
ans2_1_2= 5*6*4/2;
```

```matlab
ans2_1_3= 5/2*6*4;
ans2_1_4= 5^2*3;
ans2_1_5= 5^(2*3);
ans2_1_6= 1 + 3 + 5/5 +3 +1;
ans2_1_7= (1 + 3 + 5)*(5 + 3 + 1);
ans2_1 = [ans2_1_1, ans2_1_2, ans2_1_3, ans2_1_4, ans2_1_5, ans2_1_6, ans
2_1_7]

% 2.2
isvarname fred;
isvarname fred!;
isvarname book_1;
isvarname book-1;
isvarname 2ndplac;
isvarname Second_Place;
isvarname '#1';
isvarname No_1;
isvarname vel_5;
isvarname vel.5;
isvarname tan;
isvarname while;

% 2.3
ans2_3_1 = 5^2;
ans2_3_2 = (5+3)/(5.*6);
ans2_3_3 = (4 + 6^3)^(1/2);
ans2_3_4 = (9 + 6/12)+7.*5^(3+2);
ans2_3_5 = 1 + 5.*3/6^2 + 2^(2-4).*1/5.5;
ans2_2 = [ans2_3_1, ans2_3_2, ans2_3_3, ans2_3_4, ans2_3_5]

% 2.4 (a)
r1 =  5;
s1 = pi * r1^2;
% 2.4 (b)
r2 = 10;
s2 = 4*pi*r2^2;
% 2.4 (c)
r3 = 2;
s3 = 4/3*pi*r3^3;
ans2_4 = [s1,s2,s3]

% 2.7
P = 220;
n = 2;
V = 1;
a = 5.536;
b = 0.03049;
R = 0.08314472;
T1 = P*V/(n*R);
T2 = (P+n^2*a/V^2)*(V-n*b)/(n*R);
```

```
% 2.11 (a)
ft = 0 : 1 : 10;
m = 0.3048 * ft;
ans2_11a=[ft', m']
% 2.11 (b)
radians = 0 : 0.1*pi : pi;
degrees = 180/pi*radians;
ans2_11b = [radians', degrees']
% 2.11 (c)
mih = linspace(0, 100, 15);
fts = 0.6818.*mih;
ans2_11c=[mih, fts]
% 2.11 (d)
H_conc = linspace(0.001, 0.1, 10);
PH = -log10(H_conc);
ans2_11d = [H_conc', PH']

% 2.15 (a)
n = 2;
V = 11;
a = 5.536;
b = 0.03049;
R = 0.08314472;
P = linspace(0, 400, 10);
T11 = P*V/(n*R);
T22 = (P+n^2*a/V^2)*(V-n*b)/(n*R);
ans2_15a= T22
% 2.15 (b)
n = 2;
V = linspace(0.11, 101, 10);
a = 5.536;
b = 0.03049;
R = 0.08314472;
P = 220;
T111 = P*V/(n*R);
T222 = (P+n^2*a./V.^2).*(V-n*b)/(n*R);
ans2_15b= T222

% 2.16
a = [-1/3, 0, 1/3, 2/3];
format short
format long
format bank
format short e
format long e
format short eng
format long eng
format short g
format long g
format +
format rat
```

```matlab
% 2.17 (a)
radians = 0 : 0.1*pi : pi;
degrees = radians * 180/pi;
ans2_17 = [degrees', radians']
% 2.17 (b)
save degrees.dat -ascii ans2_17;
% 2.17 (c)
clear
load degrees.dat

% 3.1
a1 = nthroot (-5, 3);
a2 = (-5)^(1/3);
a3 = a1^3;
a4 = a2^3;
ans3_1 = [a1 a2 a3 a4]

% 3.2
b = 1:1:10;
logb10 = log(10)./log(b);
ans3_2=logb10

% 3.4
Q = 8000;
R = 1.987;
k0 = 1200;
T = 100:50:500;
k = k0*exp(-Q./(R.*T));
ans3_4 = [T', k']

% 3. 8
ans3_8 = factorial(52)/(factorial(52-5)*factorial(5))

% 3.9
ans3_9 = length(primes(20000))-length(primes(10000))

% 3.10
rad = [0:0.1:2*pi];
deg =rad*180/pi;
ans3_10 = [deg', sin(rad)', cos(rad)', tan(rad)']

% 3.13
d = 120;
hmax = d*tand(33);
hmin = d*tand(27);
ans3_13 = [hmax, hmin]

% 3.14(a)
h=200;
d=20;
ans3_14a = atan(h/d)*180/pi
```

```matlab
% 3.14(b)
ans3_14b = sqrt(d^2+h^2)


% 3.15(a)
R = [84.3 86.4 85.2 87.1 83.5 84.8 85.0 85.3 85.3 85.2 82.3 84.7 83.6;
     90.0 89.5 88.6 88.9 88.9 90.4 89.3 89.5 88.9 89.1 89.5 89.4 89.8;
     86.7 87.6 88.3 85.3 80.3 82.4 83.4 85.4 86.3 85.3 89.0 87.3 87.2]';
ans3_15a = max(R)
% 3.15(b)
ans3_15b = min(R)


% 3.17
G = [68, 83, 61, 70, 75, 82, 57, 5, 76, 85, 62, 71, 96, 78, 76, 68, 72, 7
5, 83, 93];
ans3_17=[mean(G), median(G), mode(G), std(G)]
G1=sort(G);


%3 .18
X = randn(1,10000)*23.5 + 80 ;
ans3_18=[mean(X),std(X)]


% 3.20(a)
ans3_20a = ceil(rand(1)*6)
% 3.20(b)
ans3_20b = ceil(rand(1,2)*6)
```

【实验结果】

- 运行结果

```
ans2_11d =

    0.0010000    3.0000000
    0.0120000    1.9208188
    0.0230000    1.6382722
    0.0340000    1.4685211
    0.0450000    1.3467875
    0.0560000    1.2518120
    0.0670000    1.1739252
    0.0780000    1.1079054
    0.0890000    1.0506100
    0.1000000    1.0000000

ans2_15a =

    1.2039e+01    2.9357e+03    5.8594e+03    8.7831e+03    1.1707e+04    1.4630e+04    1.7554e+04    2.0478e+04    2.3402e+04    2.6325e+04

ans2_15b =

    6.0434e+02    1.4907e+04    2.9732e+04    4.4561e+04    5.9391e+04    7.4221e+04    8.9051e+04    1.0388e+05    1.1871e+05    1.3354e+05

ans2_17 =

      0.00000      0.00000
     18.00000      0.31416
     36.00000      0.62832
     54.00000      0.94248
     72.00000      1.25664
     90.00000      1.57080
    108.00000      1.88496
    126.00000      2.19911
    144.00000      2.51327
    162.00000      2.82743
    180.00000      3.14159

ans3_1 =

   -1.70998 + 0.00000i    0.85499 + 1.48088i   -5.00000 + 0.00000i   -5.00000 + 0.00000i

ans3_2 =

       Inf    3.3219    2.0959    1.6610    1.4307    1.2851    1.1833    1.1073    1.0480    1.0000

ans3_4 =

    1.0000e+02    3.9242e-15
    1.5000e+02    2.6438e-09
    2.0000e+02    2.1700e-06
    2.5000e+02    1.2162e-04
    3.0000e+02    1.7812e-03
    3.5000e+02    1.2116e-02
    4.0000e+02    5.1030e-02
    4.5000e+02    1.5615e-01
    5.0000e+02    3.8203e-01

ans3_8 = 2598960
ans3_9 = 1033
ans3_10 =
```

```
ans3_10 =

      0.00000      0.00000      1.00000      0.00000
      5.72958      0.09983      0.99500      0.10033
     11.45916      0.19867      0.98007      0.20271
     17.18873      0.29552      0.95534      0.30934
     22.91831      0.38942      0.92106      0.42279
     28.64789      0.47943      0.87758      0.54630
     34.37747      0.56464      0.82534      0.68414
     40.10705      0.64422      0.76484      0.84229
     45.83662      0.71736      0.69671      1.02964
     51.56620      0.78333      0.62161      1.26016
     57.29578      0.84147      0.54030      1.55741
     63.02536      0.89121      0.45360      1.96476
     68.75494      0.93204      0.36236      2.57215
     74.48451      0.96356      0.26750      3.60210
     80.21409      0.98545      0.16997      5.79788
     85.94367      0.99749      0.07074     14.10142
     91.67325      0.99957     -0.02920    -34.23253
     97.40283      0.99166     -0.12884     -7.69660
    103.13240      0.97385     -0.22720     -4.28626
    108.86198      0.94630     -0.32329     -2.92710
    114.59156      0.90930     -0.41615     -2.18504
    120.32114      0.86321     -0.50485     -1.70985
    126.05071      0.80850     -0.58850     -1.37382
    131.78029      0.74571     -0.66628     -1.11921
    137.50987      0.67546     -0.73739     -0.91601
    143.23945      0.59847     -0.80114     -0.74702
    148.96903      0.51550     -0.85689     -0.60160
    154.69860      0.42738     -0.90407     -0.47273
    160.42818      0.33499     -0.94222     -0.35553
    166.15776      0.23925     -0.97096     -0.24641
    171.88734      0.14112     -0.98999     -0.14255
    177.61692      0.04158     -0.99914     -0.04162
    183.34649     -0.05837     -0.99829      0.05847
    189.07607     -0.15775     -0.98748      0.15975
    194.80565     -0.25554     -0.96680      0.26432
    200.53523     -0.35078     -0.93646      0.37459
    206.26481     -0.44252     -0.89676      0.49347
    211.99438     -0.52984     -0.84810      0.62473
    217.72396     -0.61186     -0.79097      0.77356
    223.45354     -0.68777     -0.72593      0.94742
    229.18312     -0.75680     -0.65364      1.15782
    234.91270     -0.81828     -0.57482      1.42353
    240.64227     -0.87158     -0.49026      1.77778
    246.37185     -0.91617     -0.40080      2.28585
    252.10143     -0.95160     -0.30733      3.09632
    257.83101     -0.97753     -0.21080      4.63733
    263.56059     -0.99369     -0.11215      8.86017
    269.29016     -0.99992     -0.01239     80.71276
    275.01974     -0.99616      0.08750    -11.38487
    280.74932     -0.98245      0.18651     -5.26749
    286.47890     -0.95892      0.28366     -3.38052
    292.20848     -0.92581      0.37798     -2.44939
    297.93805     -0.88345      0.46852     -1.88564
    303.66763     -0.83227      0.55437     -1.50127
    309.39721     -0.77276      0.63469     -1.21754
    315.12679     -0.70554      0.70867     -0.99558
    320.85637     -0.63127      0.77557     -0.81394
```

```
    189.07607     -0.15775     -0.98748      0.15975
    194.80565     -0.25554     -0.96680      0.26432
    200.53523     -0.35078     -0.93646      0.37459
    206.26481     -0.44252     -0.89676      0.49347
    211.99438     -0.52984     -0.84810      0.62473
    217.72396     -0.61186     -0.79097      0.77356
    223.45354     -0.68777     -0.72593      0.94742
    229.18312     -0.75680     -0.65364      1.15782
    234.91270     -0.81828     -0.57482      1.42353
    240.64227     -0.87158     -0.49026      1.77778
    246.37185     -0.91617     -0.40080      2.28585
    252.10143     -0.95160     -0.30733      3.09632
    257.83101     -0.97753     -0.21080      4.63733
    263.56059     -0.99369     -0.11215      8.86017
    269.29016     -0.99992     -0.01239     80.71276
    275.01974     -0.99616      0.08750    -11.38487
    280.74932     -0.98245      0.18651     -5.26749
    286.47890     -0.95892      0.28366     -3.38052
    292.20848     -0.92581      0.37798     -2.44939
    297.93805     -0.88345      0.46852     -1.88564
    303.66763     -0.83227      0.55437     -1.50127
    309.39721     -0.77276      0.63469     -1.21754
    315.12679     -0.70554      0.70867     -0.99558
    320.85637     -0.63127      0.77557     -0.81394
    326.58594     -0.55069      0.83471     -0.65973
    332.31552     -0.46460      0.88552     -0.52467
    338.04510     -0.37388      0.92748     -0.40311
    343.77468     -0.27942      0.96017     -0.29101
    349.50426     -0.18216      0.98327     -0.18526
    355.23383     -0.08309      0.99654     -0.08338

ans3_13 =

    77.929    61.143

ans3_14a = 84.289
ans3_14b = 201.00
ans3_15a =

    87.100    90.400    89.000

ans3_15b =

    82.300    88.600    80.300

ans3_17 =

    71.800    75.000    68.000    18.617

ans3_18 =

    79.676    23.390

ans3_20a = 6
ans3_20b =

    4    5

>>
```

【数据分析及处理】

【总结或讨论】