NAME:VODINA EFEM

DEPT:CIVIL ENGINEERING

MAT NO:16/ENG03/020

Code:

QUESTION 1

commandwindow

clear

clc

format short g

h = 0.1

y = 1.4

t = 0

for i=1:inf

 iter(i+1)=i;

 t(i+1)=t(i)+h;

 y(i+1)=y(i)+h\*(2\*t(i)+y(i)^2)

 if t(i+1) ==0.5

 break

 end

 end

iter'

t'

y'

tableau = table(iter', t' ,y')

figure(1)

plot(t,y,'b')

xlabel('time')

ylabel('dynamic response')

grid on

grid minor

axis tight

Command Window:

h =

 0.1

y =

 1.4

t =

 0

Warning: Too many FOR loop iterations. Stopping after 9223372036854775806 iterations.

> In eulerassignment (line 8)

y =

 1.4 1.596

y =

 1.4 1.596 1.8707

y =

 1.4 1.596 1.8707 2.2607

y =

 1.4 1.596 1.8707 2.2607 2.8317

y =

 1.4 1.596 1.8707 2.2607 2.8317 3.7136

ans =

 0

 1

 2

 3

 4

 5

ans =

 0

 0.1

 0.2

 0.3

 0.4

 0.5

ans =

 1.4

 1.596

 1.8707

 2.2607

 2.8317

 3.7136

tableau =

 6×3 table

 Var1 Var2 Var3

 \_\_\_\_ \_\_\_\_ \_\_\_\_\_\_

 0 0 1.4

 1 0.1 1.596

 2 0.2 1.8707

 3 0.3 2.2607

 4 0.4 2.8317

 5 0.5 3.7136



EXCEL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| h |  | t | y |  | Dy |  | dy=2t+y^2 | y=yo+h(y1)o |
| 0.1 |  | 0 | 1.4 |  | 1.96 |  |  |  |  |  |
|  |  | 0.1 | 1.596 |  | 2.747216 |  |  |  |  |  |
|  |  | 0.2 | 1.870722 |  | 3.899599 |  |  |  |  |  |
|  |  | 0.3 | 2.260682 |  | 5.710681 |  |  |  |  |  |
|  |  | 0.4 | 2.83175 |  | 8.818806 |  |  |  |  |  |
|  |  | 0.5 | 3.71363 |  | 14.79105 |  |  |  |  |  |

No 2

file 1

function dQdt = voda(t,Q)

dQdt(1) = (-0.15\*Q(1)) + (0.005\*Q(2)) + 1;

dQdt(2) = (0.03\*Q(1)) - (0.018\*Q(2)) + (0.0075\*Q(3));

dQdt(3) = (0.013\*Q(2)) - (0.0325\*Q(3));

dQdt = dQdt';

file 2

commandwindow

clear

clc

close all

[t,y] = ode45('voda',[0 1200],[0 0 0])

tableau = table(t,y)

plot(t,y)

xlabel('t')

ylabel('y')

grid on

grid minor

axis tight

legend('y\_1','y\_2')

plot(t,y(:,1),'b-')

hold on

plot(t,y(:,2),'r-')

hold on

plot(t,y(:,3),'k-')

grid on

grid minor

axis tight

legend('y\_1','y\_2','y\_3')

STEADY STATE VALUE =y1 = 7.1417

 y2 = 14.286

 y3 = 5.7143



command window

tableau =

 269×2 table

 t y

 \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 0 0 0 0

 5.0238e-05 5.0238e-05 3.7857e-11 8.2414e-18

 0.00010048 0.00010047 1.5143e-10 6.5931e-17

 0.00015071 0.00015071 3.4071e-10 2.2252e-16

 0.00020095 0.00020095 6.0571e-10 5.2745e-16

 0.00045214 0.00045212 3.0664e-09 6.0079e-15

 0.00070333 0.00070329 7.4198e-09 2.2614e-14

 0.00095452 0.00095445 1.3666e-08 5.6525e-14

 0.0012057 0.0012056 2.1804e-08 1.1392e-13

 0.0024616 0.0024612 9.0883e-08 9.6948e-13

 0.0037176 0.0037166 2.0726e-07 3.339e-12

 0.0049735 0.0049717 3.7094e-07 7.9947e-12

 0.0062295 0.0062266 5.8189e-07 1.5708e-11

 0.012509 0.012497 2.3456e-06 1.2715e-10

 0.018789 0.018762 5.2898e-06 4.3073e-10

 0.025069 0.025022 9.4133e-06 1.0227e-09

 0.031348 0.031275 1.4715e-05 1.9993e-09

 0.062747 0.062453 5.8851e-05 1.6008e-08

 0.094146 0.093484 0.00013225 5.3984e-08

 0.12554 0.12437 0.00023477 1.2781e-07

 0.15694 0.15511 0.00036624 2.493e-07

 0.31394 0.30666 0.0014526 1.9802e-06

 0.47093 0.45468 0.0032404 6.6314e-06

 0.62792 0.59926 0.0057112 1.5597e-05

 0.78491 0.74048 0.0088471 3.0227e-05

 1.2791 1.1639 0.022864 0.0001278

 1.7732 1.5571 0.042782 0.00033219

 2.2674 1.9223 0.068119 0.0006776

 2.7615 2.2614 0.098429 0.0011951

 3.2804 2.5916 0.13515 0.0019542

 3.7993 2.8971 0.17646 0.0029617

 4.3182 3.1799 0.22195 0.0042427

 4.8371 3.4416 0.27123 0.0058195

 5.593 3.7884 0.3491 0.0086858

 6.3489 4.0984 0.43333 0.01227

 7.1048 4.3754 0.52305 0.016611

 7.8606 4.623 0.61749 0.021741

 8.898 4.9209 0.7535 0.030111

 9.9354 5.1765 0.8956 0.040049

 10.973 5.3958 1.0425 0.05157

 12.01 5.5842 1.193 0.064683

 13.409 5.7976 1.4001 0.084875

 14.808 5.9719 1.6102 0.10788

 16.207 6.114 1.8221 0.1336

 17.606 6.2305 2.0342 0.16195

 19.449 6.354 2.3126 0.20313

 21.292 6.4498 2.5884 0.24836

 23.135 6.5237 2.8606 0.29731

 24.978 6.5818 3.1282 0.34969

 27.144 6.6363 3.4358 0.41523

 29.31 6.6783 3.7358 0.48457

 31.476 6.7107 4.028 0.55723

 33.641 6.7366 4.3121 0.63278

 36.323 6.7635 4.6524 0.72974

 39.005 6.7851 4.9805 0.82976

 41.687 6.8024 5.2968 0.93218

 44.369 6.8173 5.6015 1.0364

 47.786 6.8349 5.9734 1.171

 51.202 6.8502 6.328 1.3067

 54.618 6.8633 6.6664 1.4427

 58.035 6.8755 6.9894 1.5782

 62.594 6.8916 7.3974 1.7575

 67.154 6.9062 7.7811 1.9339

 71.713 6.9191 8.1422 2.1066

 76.273 6.9312 8.4822 2.2747

 82.502 6.9483 8.9147 2.4962

 88.731 6.9633 9.3136 2.7075

 94.96 6.9753 9.6822 2.9082

 101.19 6.9868 10.023 3.0981

 108.44 7.0065 10.385 3.3056

 115.7 7.0203 10.716 3.4986

 122.95 7.0221 11.022 3.6775

 130.2 7.0273 11.3 3.8432

 134.57 7.0378 11.454 3.9369

 138.93 7.0455 11.6 4.0262

 143.29 7.0494 11.739 4.1111

 147.66 7.0531 11.871 4.1919

 152.02 7.0591 11.996 4.2689

 156.38 7.0641 12.114 4.3422

 160.74 7.0678 12.227 4.4118

 165.11 7.0714 12.333 4.478

 170.97 7.0774 12.467 4.5619

 176.84 7.0824 12.592 4.6402

 182.7 7.0854 12.709 4.7133

 188.56 7.0886 12.818 4.7814

 195.7 7.0978 12.938 4.8583

 202.83 7.1031 13.05 4.9289

 209.96 7.1002 13.154 4.9936

 217.09 7.1001 13.248 5.053

 221.72 7.1062 13.304 5.089

 226.35 7.1099 13.357 5.1231

 230.97 7.1102 13.408 5.1552

 235.6 7.1108 13.457 5.1856

 240.22 7.114 13.502 5.2144

 244.85 7.1163 13.544 5.2417

 249.48 7.1171 13.585 5.2674

 254.1 7.118 13.623 5.2917

 259.99 7.1211 13.668 5.3208

 265.88 7.1232 13.711 5.348

 271.77 7.1231 13.751 5.3731

 277.66 7.1236 13.788 5.3966

 284.5 7.1298 13.827 5.422

 291.34 7.1325 13.863 5.4453

 298.18 7.1273 13.898 5.4665

 305.01 7.1249 13.929 5.4861

 309.7 7.1297 13.948 5.4988

 314.39 7.1322 13.967 5.5108

 319.08 7.1312 13.985 5.522

 323.77 7.1305 14.001 5.5326

 328.46 7.1327 14.017 5.5427

 333.15 7.134 14.032 5.5522

 337.84 7.1338 14.046 5.5611

 342.53 7.1338 14.059 5.5696

 348.37 7.1359 14.074 5.5795

 354.2 7.1369 14.089 5.5887

 360.04 7.1359 14.102 5.5973

 365.87 7.1354 14.115 5.6052

 372.57 7.1404 14.127 5.6139

 379.28 7.1421 14.139 5.6217

 385.98 7.1367 14.152 5.6288

 392.69 7.1338 14.163 5.6354

 397.46 7.138 14.169 5.6399

 402.22 7.1399 14.176 5.6442

 406.99 7.1384 14.182 5.648

 411.76 7.1372 14.188 5.6517

 416.53 7.1392 14.193 5.6553

 421.3 7.1402 14.198 5.6586

 426.06 7.1395 14.203 5.6617

 430.83 7.1391 14.208 5.6647

 436.64 7.1409 14.213 5.6681

 442.45 7.1417 14.218 5.6712

 448.26 7.1402 14.223 5.6741

 454.07 7.1394 14.227 5.6768

 460.65 7.1439 14.231 5.6798

 467.23 7.1454 14.235 5.6825

 473.82 7.14 14.24 5.6848

 480.4 7.1369 14.244 5.687

 486.37 7.1457 14.245 5.6891

 492.35 7.1488 14.247 5.6909

 498.32 7.1397 14.252 5.6924

 504.3 7.1341 14.256 5.6937

 509.12 7.1409 14.256 5.6951

 513.94 7.1439 14.257 5.6962

 518.77 7.1407 14.259 5.6972

 523.59 7.1383 14.261 5.6981

 528.07 7.141 14.262 5.699

 532.55 7.1423 14.263 5.6998

 537.04 7.1415 14.264 5.7006

 541.52 7.1409 14.266 5.7013

 546.76 7.1424 14.267 5.7021

 552.01 7.143 14.268 5.7029

 557.25 7.142 14.269 5.7036

 562.49 7.1413 14.27 5.7042

 568.86 7.1439 14.271 5.705

 575.23 7.1448 14.272 5.7057

 581.6 7.1417 14.273 5.7063

 587.97 7.14 14.275 5.7068

 594.44 7.1472 14.274 5.7076

 600.92 7.1494 14.274 5.7082

 607.39 7.1406 14.277 5.7084

 613.87 7.1355 14.279 5.7087

 619.21 7.1443 14.277 5.7093

 624.54 7.1477 14.277 5.7097

 629.88 7.141 14.279 5.7098

 635.22 7.1365 14.281 5.71

 639.69 7.141 14.28 5.7103

 644.17 7.143 14.28 5.7106

 648.64 7.1417 14.28 5.7107

 653.12 7.1406 14.281 5.7109

 657.86 7.1424 14.281 5.7111

 662.59 7.1431 14.281 5.7113

 667.33 7.1424 14.281 5.7115

 672.07 7.1418 14.282 5.7116

 677.93 7.1434 14.282 5.7118

 683.79 7.144 14.282 5.712

 689.64 7.1424 14.282 5.7121

 695.5 7.1414 14.283 5.7122

 702.17 7.146 14.282 5.7125

 708.83 7.1474 14.282 5.7127

 715.5 7.1414 14.284 5.7127

 722.17 7.1381 14.285 5.7127

 726.93 7.1421 14.284 5.7129

 731.69 7.1439 14.283 5.713

 736.45 7.142 14.284 5.713

 741.22 7.1407 14.284 5.7131

 745.98 7.1425 14.284 5.7132

 750.74 7.1433 14.284 5.7133

 755.5 7.1425 14.284 5.7133

 760.26 7.1419 14.284 5.7133

 766.07 7.1435 14.284 5.7135

 771.87 7.1441 14.284 5.7135

 777.67 7.1425 14.285 5.7135

 783.47 7.1414 14.285 5.7136

 790.05 7.1458 14.284 5.7137

 796.63 7.1471 14.284 5.7138

 803.21 7.1416 14.285 5.7137

 809.8 7.1385 14.286 5.7137

 815.78 7.1472 14.284 5.7139

 821.76 7.1501 14.283 5.714

 827.74 7.1409 14.286 5.7138

 833.73 7.1352 14.287 5.7137

 838.56 7.142 14.285 5.7139

 843.38 7.1449 14.285 5.714

 848.21 7.1416 14.286 5.7139

 853.04 7.1391 14.286 5.7139

 857.52 7.1418 14.286 5.714

 862 7.1431 14.285 5.714

 866.49 7.1423 14.285 5.714

 870.97 7.1416 14.286 5.714

 876.2 7.143 14.285 5.7141

 881.44 7.1436 14.285 5.7141

 886.67 7.1426 14.285 5.7141

 891.91 7.1419 14.286 5.7141

 898.27 7.1444 14.285 5.7142

 904.63 7.1452 14.285 5.7142

 911 7.1422 14.286 5.7141

 917.36 7.1404 14.286 5.7141

 923.84 7.1476 14.284 5.7143

 930.32 7.1497 14.284 5.7143

 936.8 7.1409 14.286 5.7141

 943.28 7.1358 14.287 5.714

 948.63 7.1446 14.285 5.7142

 953.97 7.148 14.284 5.7143

 959.32 7.1413 14.286 5.7142

 964.67 7.1367 14.287 5.7141

 969.14 7.1412 14.286 5.7142

 973.62 7.1432 14.286 5.7142

 978.1 7.1419 14.286 5.7142

 982.57 7.1408 14.286 5.7142

 987.3 7.1425 14.286 5.7142

 992.04 7.1433 14.286 5.7142

 996.77 7.1425 14.286 5.7142

 1001.5 7.142 14.286 5.7142

 1007.4 7.1436 14.285 5.7143

 1013.2 7.1441 14.285 5.7143

 1019 7.1425 14.286 5.7142

 1024.9 7.1415 14.286 5.7142

 1031.6 7.1461 14.285 5.7143

 1038.2 7.1474 14.285 5.7144

 1044.9 7.1415 14.286 5.7142

 1051.6 7.1382 14.287 5.7141

 1056.3 7.1422 14.286 5.7142

 1061.1 7.1439 14.285 5.7143

 1065.9 7.1421 14.286 5.7142

 1070.6 7.1407 14.286 5.7142

 1075.4 7.1426 14.286 5.7143

 1080.2 7.1433 14.286 5.7143

 1084.9 7.1425 14.286 5.7143

 1089.7 7.1419 14.286 5.7142

 1095.5 7.1436 14.286 5.7143

 1101.3 7.1441 14.285 5.7143

 1107.1 7.1425 14.286 5.7143

 1112.9 7.1415 14.286 5.7142

 1119.5 7.1458 14.285 5.7143

 1126.1 7.1471 14.285 5.7144

 1132.6 7.1416 14.286 5.7142

 1139.2 7.1385 14.287 5.7142

 1145.2 7.1472 14.285 5.7144

 1151.2 7.1501 14.284 5.7145

 1157.1 7.1409 14.286 5.7142

 1163.1 7.1353 14.287 5.7141

 1167.9 7.142 14.286 5.7143

 1172.8 7.1449 14.285 5.7143

 1177.6 7.1416 14.286 5.7142

 1182.4 7.1392 14.287 5.7142

 1186.8 7.1417 14.286 5.7143

 1191.2 7.1429 14.286 5.7143

 1195.6 7.1423 14.286 5.7143

 1200 7.1417 14.286 5.7143