

EE 202 - Mathematical Techniques in Electrical Engineering

LAB 6

** Find solutions of the following questions in Matlab:

Question:

Using Runge-Kutta Method of Order 4, solve $\frac{dy}{dx} = \frac{5x^2 - y}{e^{x+y}}$ with $y(0) = 1$ by using step size of $h = 0.1$ for $0 \leq x \leq 1$.

```
h=0.1;
x=0:h:1;
y=zeros(1,length(x)-1);
y(1)=1;
for i=1:length(x)-1
F1(i)=h*((5*x(i).^2)-y(i))/(exp(x(i)+y(i)));
F2(i)=h*((5*(x(i)+(h/2)).^2)-
(y(i)+(F1(i)/2)))/(exp((x(i)+(h/2))+(y(i)+(F1(i)/2))));
F3(i)=h*((5*(x(i)+(h/2)).^2)-
(y(i)+(F2(i)/2)))/(exp((x(i)+(h/2))+(y(i)+(F2(i)/2))));
F4(i)=h*((5*(x(i)+h).^2)-
(y(i)+(F3(i))))/(exp((x(i)+h)+(y(i)+(F3(i)))));
y(i+1)=y(i)+((1/6)*(F1(i)+2*F2(i)+2*F3(i)+F4(i)));
end
plot(x,y)
```