## Question 1

```
% Question:
    % What forms of solar activity can be found in the Photosphere?

 % Solution:

    %{
        The following forms of solar activity can be found in the photosphere:
          -Granules
          -Supergranulations
          -Faculae
          -Solar Flares
          -Sunspots
    %}
```

## Question 2

```
% Question:
    % Classify a Solar Flare with a X-Ray output of 3*10^-5 W/m^2 .

% Solution:

    %{
        Since the X-Ray output = 3*10^-5 W/m^2 that lands in the M3
        class Solar Flare.

    %}
```

## Question 3

```
% Question
    % What is the defining characteristic of terminal shock?

% Solution

    %{
        Given that a Solar wind slows down as it expands at a rate of ~
        2.7 km/sec per AU, it becomes terminal shock once it drops to
        subsonic.

    %}
```

## Question 4

```
% Question
    % What is the solar constant as the orbit of Ceres (2.767 AU)

% Solution
```

```
    %{
            Using the equation s(r) = s_e*(a/r)^2
                        where

                            s_e = Solar Coonstant at distance R
                            a = 1 AU
                            r = distance from the sun


    %}

clc; clear;
a = 1 ; % AU
s_e = 1366.1 ; % W/m^2
r = 2.767 ; % AU

s_r = s_e*(a/r)^2;

fprintf('The solar constant as the orbit of ceres is %.4f W/m^2',s_r)
```

```
  The solar constant as the orbit of ceres is 178.4285 W/m^2
```

## Question 5

```
% Question
    %{
        What is the critical radius of a particle with a density of 2.5
        kg/m^3? Assume C=1.25 Hint: Use appendix B

    %}

% Solution
        %{
         Using the equation r_c =< (3*C_r*S_e*a_earth^2)/(4*c*GM_sun*rho)
          Eq. 5.58
        %}




C_r = 1.25 ;
S_e = 1366.1 ;          % W/m^2
a_earth = 1.496*10^11   % m
```

```
  a_earth = 1.4960e+11
```

```
C = 299792458           % m/s
```

```
  C = 299792458
```

```
GM_sun = 1.327*10^20    % m^3 / s^2
```

```
  GM_sun = 1.3270e+20
```

```
rho = 2.5               % kg/m^3
```

```
  rho = 2.5000
```

```
r_c = (3*C_r*S_e*a_earth^2)/(4*C*GM_sun*rho);
```

```
fprintf(" The critical radius of a particle with a density of 2.5 kg/m^3 is r < %.6e meters", r_c)
```

The critical radius of a particle with a density of 2.5 kg/m^3 is r < 2.881943e-04 meters