1) A spherical aluminium shell of inside diameter $D = 2 \text{ m}$ is evacuated and is used as a radiation test chamber. If the inner surface is coated with carbon black and maintained at 600 $K$, what is the irradiation on a small test surface placed in the chamber?

- 6.87 $kW/m^2$
- 7348.32 $W/m^2$
- 3568.54 $W/m^2$
- 5.46 $kW/m^2$

**No, the answer is incorrect.**

**Score:** 0

**Accepted Answers:**
- 7348.32 $W/m^2$

2) A spherical aluminium shell of inside diameter $D = 2 \text{ m}$ is evacuated and is used as a radiation test chamber. If the inner surface were not coated and maintained at 600 $K$, how would irradiation vary from that of Q1 be?

- Irradiation would decrease
- Irradiation would increase
- Irradiation is independent of surface coating
- None of the above

**No, the answer is incorrect.**
Calculate the band emission fractions for the visible region, 0.47 \( \mu m \) to 0.65 \( \mu m \), for each of the two lighting sources. Third radiation constant, 
\[ C_3 = 2897.8 \mu m \cdot K \]

Use the following table for calculations,

<table>
<thead>
<tr>
<th>( \lambda ) (( \mu m ))</th>
<th>0.26</th>
<th>0.49</th>
<th>0.76</th>
<th>0.98</th>
</tr>
</thead>
</table>

No, the answer is incorrect.  
Score: 0  
Accepted Answers: 0.26

4) The human eye, as well as the light-sensitive chemicals on colour photographic film, respond differently to lighting sources with different special distributions. Daylight lighting corresponds to the spectral distribution of the solar disk, which may be approximated as a blackbody at 5800 \( K \).

Calculate wavelength of corresponding the maximum spectral intensity for each of the light sources.

Use the following table for calculations,

<table>
<thead>
<tr>
<th>( \lambda ) (( \mu m ))</th>
<th>0.50</th>
<th>5.20</th>
<th>1.42</th>
<th>2.68</th>
</tr>
</thead>
</table>

No, the answer is incorrect.  
Score: 0  
Accepted Answers: 0.50 \( \mu m \)

5) The spectral, directional emissivity of a diffuse material at 2000 \( K \) has the following distribution:

Determine the total hemispherical emissivity at 2000 \( K \).  
Use the following table for calculations,
6) The spectral, directional emissivity of a diffuse material at 2000 K has the following distribution:

Determine the emissive power over the spectral range 0.8 μm to 2.5 μm and for the directions $0 \leq \theta \leq 30^\circ$.

Use the following table for calculations,

- $76.9 \text{ kW/m}^2$
- $85.6 \text{ kW/m}^2$
- $63.7 \text{ W/m}^2$
- $58.2 \text{ kW/m}^2$

No, the answer is incorrect.
Score: 0
Accepted Answers:
- $76.9 \text{ kW/m}^2$

7) Determine view factor $F_{12}$ and $F_{21}$ for the following configuration.

- $F = \frac{2}{\pi}$
- $F = 2\pi$
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
- $F = \frac{2}{\pi}$