**Spectroscopy Questions**

**Name** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Sketch intensity plots for
	1. i) a continuous spectrum
	2. ii) an absorption spectrum
	3. iii) an emission spectrum.
2. Sketch Blackbody curves for a 12,000 and a 5,000 K black body on the same axes. Identify and account for two differences in the curves. In what ways are they similar?
3. Identify an astronomical source for each of the following types of spectrum:
	1. i) An emission spectrum
	2. ii) an absorption spectrum
4. Sketch the photographic spectrum (picture not graph) you would expect to see from
	1. i) an incandescent lamp
	2. ii) a hydrogen gas discharge tube
	3. iii) reflected sunlight
	4. iv) a fluorescent lamp
5. Explain the spectral features you would expect to find in an emission nebula such as M 42, the Great Nebula of Orion.
6. Why do we see spectral lines of ionised He+ in O-class stars but not in the Sun's spectrum?
7. What does the presence of large number of molecular spectral lines (from molecules) in M-class stars suggest about their effective temperature?
8. Describe two ways in which the spectrum of a star can be used to determine its effective temperature.
9. If the core of a main sequence star acts like a black body source of a continuous spectrum, why do we typically see absorption lines in stellar spectra?
10. Why do most modern astronomical spectrographs uses diffraction gratings rather than prisms to disperse light?
11. Why does an O-class star appear blue and an M-class star appear red?
12. If a star has a peak wavelength of 450 nm at maximum intensity calculate its effective temperature.
13. Which of the four stars below, A, B, C or D is hottest? Justify your answer. (Ignore the blue background lines in each spectrum).



 Credit: Spectra courtesy of *The Sloan Digital Sky Survey*

1. In the diagram in question 19 above, which star is coolest? How can you tell?
2. Construct a table showing the spectral classes, key spectral features, color and effective temperature range for stars.