Unit D: Space Exploration Outcomes and Review Questions (62 marks)

Name: _____ Date: _____

_____ I can identify the dates of the solstices and the equinoxes and describe why ancient peoples built monuments to mark their passing

_____ I can describe the evolving models of our universe including the geocentric and heliocentric models.

_____ I can identify types of technology used to observe the universe including quadrants, sundials, and telescopes.

_____ I know how far an astronomical unit and a light year are and when to use each type of measurement.

_____ I can describe in general terms the life cycle of star including where they are formed, the two competing forces while they are in main sequence and what happens to different size stars when they die.

_____ I can explain the Hertzprung-Russell Diagram and the relationship between temperature and colour of stars in my own words.

_____ I can describe the characteristics of the planets in our solar system compared to Earth.

_____ I can use techniques for determining the position and motion of objects in space including models, estimation, triangulation, parallax, altitude and azimuth.

_____ I can identify challenges that must be met in developing life-support systems in space (ie. gravity, temperature, water)

_____ I can describe technology used to support and sustain life in space.

_____ I can describe scientific technologies and principles used for space transport.

_____ I can identify materials created for space that are used on Earth.

_____ I can describe the development of artificial satellites and what they are used for (ie. communication, weather, GPS and military)

_____ I can explain the operation of reflecting and refracting telescopes.

_____ I can explain the role of radio and optical telescopes in determining the characteristics of stars.

_____ I can identify some disadvantages of space exploration.

_____ I can identify Canadian contributions to the space program ie Canadarm.

_____ I can identify and analyze environmental, political, economical and ethical issues as they relate to space exploration and development.

1. What's revolving in a heliocentric model of the solar system? What's revolving in a geocentric model? (2)

2. Explain what is meant by the word "elliptical". What does this word have to do with the study of space? (2)

3. What kinds of things do radio telescopes and radio interferometry allow us to see that Galileo could never have seen with his simple refracting telescope? How does a radio telescope work? (2)

4. When gasoline is spilled on the ground, a rainbow like sheen can bee seen. Are the colours that you see being absorbed or emitted? Explain. (2)

5. List 4 differences between inner planets and outer planets in our solar system. In order (from closest to the sun to furthest) identify each planet as either terrestrial or gas giants. (6)

6. Venus is a terrestrial planet but has far more carbon dioxide in its atmosphere then Earth. What major effect do you think this has on the planet & it's environmental conditions? (1)

7. Does the moon produce, absorb, reflect, or refract light? What is the difference between reflection and refraction? (2)

8. What galaxy do we live in? How many constellations in our galaxy? How many galaxies are there in the universe? (3)

9. A spectroscope reveals some dark lines when used to observe the spectra of star. Why? What does that allow us to know? (2)

10. Explain what happens to both pitch and sound waves as a police car approaches you and as it moves away from you. What is this referred to as? (3)

11. Explain what is meant by red-shift. What does it mean about the nature of our universe? (2)

12. Sketch a diagram showing the differences between all types of electromagnetic radiation. (2)

13. List three physiological changes that occur to an astronaut who spends prolonged amounts of time in space. (3)

14. Why is it important to maintain carbon dioxide and oxygen concentrations at a constant level in the cabin of any manned spacecraft? (1)

15. What are the three components of a rocket? Which component is different between a rocket use in war (ballistic missile) and a rocket used to launch a satellite? (4)

16. List three ways that humans have benefited from satellites. (3)

17. Satellite TV users shouldn't have to ever reposition their dish. This is because the satellite it is receiving information from is in a _____ orbit. Describe what this means. (2)

18. What advantages does the Hubble telescope have over ground based telescopes? (1)

19. What is the difference between a refracting telescope and a reflecting telescope? Which was used first and which is more powerful? (2)

20. Sketch and explain how you would use triangulation to find the distance to a distant object. (2)

21. What is space junk and how is it dangerous? (2)

22. Identify three significant Canadian space achievements. (3)

23. List two political, ethical, and environmental considerations for space exploration. (3)

24. What is the difference between altitude and azimuth when describing a star's position? Explain how they would be different for somebody in northern BC and somebody in southern Ontario. (3)

25. Sketch a diagram showing the life cycle of a sun-like star and a massive star. (4)