

Solar System B – Northeast Kansas Regional Tournament 2014  
Answer Key

SECTION 1 – Multiple Choice

- |      |       |       |
|------|-------|-------|
| 1) E | 10) A | 19) C |
| 2) D | 11) C | 20) C |
| 3) C | 12) E | 21) D |
| 4) E | 13) A | 22) B |
| 5) A | 14) B | 23) D |
| 6) B | 15) A | 24) E |
| 7) B | 16) D | 25) D |
| 8) D | 17) A |       |
| 9) D | 18) B |       |

SECTION 2 – True/False

- 26) True
- 27) False. It is about 85% CO<sub>2</sub> ice and 15% water ice.
- 28) False. Europa is believed to have an iron core.
- 29) False. The distance from sunlight is not an important factor.
- 30) True
- 31) False. It is believed to have been active for over 10 million years.
- 32) True
- 33) False. Iapetus' mass is 2.5% that of Earth's moon.
- 34) False. Triton's crust is mostly water ice; the surface is mostly frozen nitrogen.
- 35) False. Not every comet maintains its solar orbit; some are flung out of orbit.

SECTION 3 – Situational Application

PART A

- 36) Take off one point for each object out of sequence. Award one bonus point if all are correct. (7 + 1 = 8)
  - a. 2
  - b. 3
  - c. 4
  - d. 6
  - e. 1
  - f. 7
  - g. 5
- 37) Take off one point for each object out of sequence. Award one bonus point if all are correct. (6 + 1 = 7)
  - a. 2
  - b. 1
  - c. 4
  - d. 6
  - e. 5
  - f. 3

#### PART B

- 38) A protoplanetary disc in orbit about the sun whose components were ejected into lengthy parabolic/elliptical orbits due to gravitational interaction with gas giants (3)
- 39) No (1)
- 40) New Horizons (2)
- 41) Kuiper Belt: 30-55 AU (2) Oort Cloud: 5,000-100,000 AU (2) (+1 for using AU)
- 42) Gerard Kuiper (1) and Jan Oort (1)
- 43) Eris (2)

#### PART C

- 44) Saturn (2)
- 45) Jupiter (2)
- 46) Galileo discovered four of Jupiter's moons (the Galilean satellites) (2)
- 47) Viking 1 (2) and Viking 2 (2)
- 48) Water Vapor (3)
- 49) Dawn (2)

#### PART D

- 50) Enceladus (3)
- 51) Tiger Stripes (3)
- 52) Tiger Stripes are significantly hotter than the rest of Enceladus (3) suggesting that there is a strong internal heat source on Enceladus (2). This increases the probability that there is liquid water on Enceladus (2).
- 53) Europa (3)
- 54) Areas of internal geologic activity (5)
- 55) Europa (3)
- 56) Thera (3) and Thrace (3)
- 57) Complete melt through of Europa's icy shell from an ocean below OR warm ice welling up causing partial melting and disruption of the surface (5)
- 58) Galileo (2)