MAGNETISM QUIZ

MAGNETISM

1. What force steers particles in a supercollider?
   A. Centrifugal
   B. Electric
   C. Magnetic
   D. Gravity

2. What can we learn from the paths of charged particles after a supercollider collision?
   A. Charge of particle
   B. All of these
   C. Mass of particle
   D. Energy of particle

3. How has the Earth's magnetic field changed over time?
   A. Sometimes has flipped direction
   B. The pole does not move
   C. Is presently increasing
   D. It doesn't change

4. How do we know that the Earth's magnetic field has reversed in the past?
   A. Chinese historical writings
   B. Greenland ice cores
   C. Tree ring data
   D. Striations in the mid-Atlantic ridge

5. Why should we worry about the Earth's changing magnetic field?
   A. Danger to astronauts
   B. All of these
   C. Danger to spacecraft
   D. Danger to power grid

6. Who might be affected if the Earth's magnetic field reversed?
   A. People near the poles
   B. People underwater
   C. Everyone
   D. People dependent on solar energy

7. About how many stars are in our Milky Way Galaxy?
   A. About 200 Thousand
   B. About 200 Billion
   C. About 200 Million
   D. About Two Thousand

8. Does the Milky Way have a magnetic field?
   A. Yes, all through it
   B. Only near black holes
   C. Only near stars
   D. Only near the center

9. How can we detect the Milky Way's magnetic field?
   A. Flux gate magnetometers
   B. Polarization of gamma rays
   C. Search coil magnetometers
   D. Polarization of radio waves

10. What is the most energetic electromagnetic radiation?
   A. Extreme Ultraviolet
   B. X-rays
   C. Death rays
   D. Gamma rays

11. How do magnetic fields affect neutron stars (cores of a supernova remnant)?
   A. Enhance nuclear fusion
   B. Speed up the rotation
   C. All of these
   D. Guide beams of radio energy

12. How soon might the Earth's magnetic field reverse?
   A. In three million years
   B. In the next one or two thousand years
   C. Next Sunday
   D. Never

13. The Earth's magnetic north pole is near
   A. the equator
   B. the geographic north pole
   C. the South Atlantic Anomaly
   D. the geographic south pole

AURORA

14. How is the aurora on a brown dwarf different from an Earth aurora?
A. Pink and more energetic
B. More energetic
C. Caused by uranium
D. Pink color

15. What causes auroras?
A. Neutrons hitting nuclei
B. Cosmic rays hitting atomos or molecules
C. Electrons hitting atoms or molecules
D. Refraction of sunlight

16. What causes the color of the aurora?
A. The atom or molecule giving up an energy step
B. The energy of the cosmic ray
C. All of these
D. Refraction of sunlight

17. Where do most charged particles enter Earth's atmosphere?
A. Near the poles
B. Bermuda Triangle
C. Near the equator
D. Marianas trench

18. Describe different auroral shapes.
A. Any of these
B. Sheets or curtains
C. Rays
D. Curls

19. Auroral light is primarily
A. Line emission: pink, green, orange and yellow
B. Line emission: orange, purple, green and yellow
C. Line emission: green, blue, red, and crimson
D. Spectrum of colors (rainbow)

20. The electrons that power the aurora
A. come directly from the Sun
B. come from the Sun via the magnetic tail
C. come from nuclear fission
D. are accelerated by the earth's gravity

PLANETARY MAGNETISM

21. What would we know if we found auroras around a distant planet?
A. The composition of its atmosphere
B. Whether it has moons
C. Its mass
D. All of these

22. How did we detect the magnetic field around an exoplanet?
A. Dimming from the bow shock
B. Changes on its moon
C. Radio waves
D. Infrared radiation

23. About how many extra-solar planets have we discovered?
A. Thousands
B. Hundreds
C. Four
D. Millions

24. What is special about the spin axis of Uranus?
A. Exactly aligned with the magnetic pole
B. Carbon Dioxide
C. Gives all days through the year exactly the same length
D. Almost in the ecliptic plane

25. Which planet has the strongest magnetic field?
A. Jupiter
B. Neptune
C. Uranus
D. Saturn

26. Which outer planet does not have a magnetic field?
A. They all do
B. Uranus
C. Saturn
D. Neptune

27. Which inner planets have magnetic fields?
A. Mars only
B. Mercury only
C. Earth and Mercury
D. Earth only

28. Does Mars have liquid surface water?
A. Yes, large rivers and lakes
B. Not now, and never did
C. Yes, underground
D. Not now, but it used to

29. Why doesn't Venus have a magnetic field?
A. Spin too slow
B. All of these
C. No liquid metal core
D. Atmosphere too thin

30. Why is it important for a planet to have a magnetic field?
A. All of these
B. Protect its water from escaping
C. Protect its cosmic rays from escaping
D. Protect its Carbon Dioxide from escaping

31. What properties are required for a planet to have a magnetic field?
A. Both spin and liquid metal core
B. Atmosphere
C. Liquid metal core
D. Spin

32. What element causes the Earth to have a magnetic field?
A. Mercury
B. Hydrogen
C. Iron
D. Magnesium

SUN MAGNETISM

33. What force makes particles rise up from the Sun's surface in arcs?
A. Magnetic
B. Electric
C. Gravity
D. Hurricane

34. What force makes most particles in prominences return to the Sun?
A. Pressure Gradient
B. Gravity
C. Electric
D. Magnetic

35. The arcs of prominences are channeled by
A. magnetism
B. pressure gradient
C. electric fields
D. gravity

36. The highest magnetic fields on the sun's surface are found in
A. plages
B. sunspots
C. flares
D. CME's

SPACE MISSIONS

37. How far can Earth's magnetic field protect astronauts?
A. Only relatively close to the Earth
B. Nearly to Mars
C. Beyond Jupiter
D. As far as the Moon

38. What is special about the MMS spacecraft?
A. All of these
B. Orbit optimized to pass through reconnection sites
C. Highest spacecraft to use GPS
D. Closest flying formation

39. What is the MMS mission?
A. Mission to study M&Ms
B. Mission to orbit Mercury
C. Four spacecraft studying magnetic reconnection
D. Mission to pass close to the Sun

40. What happens at reconnection sites?
A. Magnetic energy changes to particle energy
B. Earth's magnetic field keeps out the solar wind
C. Earth's atmosphere is decreased
D. Particle energy changes to magnetic energy

41. What formation does the MMS mission fly in?
A. Three spacecraft in a triangle
B. Four spacecraft in a pyramid
C. Eight spacecraft at the corners of a cube
D. Three spacecraft in a line

ANIMAL MAGNETISM

42. The organs that detect electric fields in sharks are called
A. Electrosensors
B. Interstitial magnetic organ
C. Ampullae of Lorenzini
D. Intercranial gel

43. How do sharks and some other animals use magnetism to navigate?
A. GPS
B. Following the mid-atlantic ridge
C. Sensing electric fields
D. Sensing magnetic fields

QUIZ KEY

MAGNETISM

1. C
2. B
3. A
4. D
5. B
6. C
7. B
8. A
9. D
10. D
11. D
12. B
13. D

AURORAS

14. A
15. C
16. A
17. A
18. A
19. C
20. B

PLANETARY MAGNETISM

21. A
22. A
23. A
24. D
25. A
26. A
27. C
28. D
29. A
30. B
31. A
32. C

SUN MAGNETISM

33. A
34. B
35. A
36. B

SPACE MISSIONS

37. A
38. A
39. C
40. A
41. B

ANIMAL MAGNETISM

42. C
43. C