



National Earth Science Exam

EMS Earth Science National Championship Exam

Name _____

School

Grade _____

Email address _____

Instructions – Circle the correct answer or leave it blank. Correct answers are worth 2 points. Incorrect answers are worth –1 point. Questions left blank are worth 0 points.

1. The distance in degrees north or south of the Equator is
 - A. Latitude
 - B. Longitude
 - C. Declination
 - D. Projection
2. The factor that the experimenter changes is called
 - A. The responding variable
 - B. The independent variable
 - C. The dependent variable
 - D. The controlled variables
3. The fraction of solar radiation that is reflected off the surface of an object
 - A. Refraction
 - B. Radiation
 - C. Angle of incidence
 - D. Albedo
4. The grinding and wearing away of rock surfaces by other rock particles is called
 - A. Abrasion
 - B. Reduction
 - C. Friction

5. What star sits directly above the north pole?
 - A. The Sun
 - B. Polaris
 - C. Polaris Australis
 - D. Vega

6. The brightness that a star would have at a distance of 32.6 light years from Earth
 - A. Spectra
 - B. Parallax
 - C. Apparent magnitude
 - D. Absolute magnitude

7. Which of the following is not an inverse square law?
 - A. Universal Law of Gravity
 - B. Luminosity
 - C. Nuclear Force
 - D. Sound intensity

8. What type of star is Betelgeuse?
 - A. Neutron
 - B. Supergiant
 - C. Giant
 - D. White dwarf

9. The Sun, at the end of its life cycle will become a
 - A. Neutron
 - B. Supergiant
 - C. Giant
 - D. White dwarf

10. What layer of the sun produces energy in the form of visible light?
 - A. The Photosphere
 - B. The Convective Zone
 - C. Sunspots
 - D. The Radiative Zone

11. The gravitational force on the moon is
 - A. One half that of the Earth
 - B. One third that of the Earth
 - C. One sixth that of the Earth
 - D. Nearly the same as Earth

12. The Moon's surface is covered by a layer of rock and dust called
 - A. Regolith
 - B. Rille
 - C. Mare
 - D. Breccia

13. The point at which the moon is farthest from the Earth is called
 - A. Apogee
 - B. Perigee
 - C. Circumgyration
 - D. Locus
14. Why does the moon rise or set 50 minutes later each night?
 - A. The Earth's rotation is in synch with the moon's revolution
 - B. The moon is like a geosynchronous satellite
 - C. It takes 50 minutes for Earth's horizon to catch up to the moon
 - D. The moon and the Earth move opposite to each other
15. Which German scientist proposed a hypothesis now called continental drift?
 - A. Frederike Otto
 - B. Alfred Wegner
 - C. Albert Richter
 - D. Axel Timmermann
16. What evidence supported the theory of continental drift?
 - A. Fossil evidence
 - B. Meteorite evidence
 - C. No two coastlines are the same
 - D. Ice core evidence
17. Mid-ocean ridges occur at what type of boundary?
 - A. Convergent boundaries
 - B. Strike-slip boundaries
 - C. Transform boundaries
 - D. Divergent boundaries
18. What makes materials magnetic ?
 - A. Atoms whose magnetic fields are not aligned
 - B. Atoms whose magnetic fields are aligned
 - C. Atoms who acquire magnetic fields from other atoms
 - D. Atoms who have abnormal polarity
19. What does the Ring of Fire refer to?
 - A. Glacial jet stream
 - B. The regions where wildfires are made worse by climate change
 - C. The area around the Pacific ocean that has numerous volcanoes
 - D. An aboriginal ceremony dedicated to volcanoes
20. The San Andreas fault is a famous example of a
 - A. Divergent boundary
 - B. Convergent boundary
 - C. Transform boundary
 - D. Subduction zone
21. A piece of lithosphere that has a unique geologic history and may be part of a larger piece of lithosphere is called a(n)
 - A. Terrane
 - B. Accretion
 - C. Shield
 - D. Craton
22. The single, large ocean that surrounded Pangea was called
 - A. Comoros
 - B. Laurasia
 - C. Tethys Sea
 - D. Panthalassa
23. The Himalayas, the Appalachians are examples of
 - A. Folded Mountains
 - B. Dome Mountains
 - C. Fault-block Mountains
 - D. Grabens
24. What is the term for the condition of gravitational equilibrium in Earth's crust?
 - A. Deformation
 - B. Isostasy
 - C. Strain
 - D. Stress
25. Which of the following can result in mountain formation ?
 - A. Deposition and isostasy
 - B. Weathering and erosion
 - C. Strike-slip fault involving two continental plates
 - D. Subduction of an oceanic plate beneath a continental plate
26. The location within Earth along a fault at which the first motion of an earthquake occurs is called the
 - A. Epicenter
 - B. Focus
 - C. P-wave
 - D. Elastic rebound
27. Which earthquake waves are compression waves?
 - A. P-waves
 - B. S-waves
 - C. Love waves
 - D. Rayleigh waves

28. A deep bowl-like depression produced by glacier erosion is a(n)?
- Blowout
 - Cirque
 - Karst
 - Endorheic
29. Which seismic waves can't travel through Earth's liquid outer core?
- Love Waves
 - P-waves
 - Rayleigh waves
 - S-waves
30. The resistance to flow of material, like magma is called?
- Viscosity
 - Mantle plumes
 - Fluidity
 - Sluggishness
31. In an effort to limit erosion of soil, which technique is NOT used by farmers
- Strip-cropping
 - Contour plowing
 - Terracing
 - Moldboard plowing
32. When a block of soil and rock becomes unstable and slides along a curved slope in one piece it is called a ?
- Slump
 - Creep
 - Landslide
 - Solifluction
33. Small, narrow-topped formations are called ?
- Mesas
 - Plateaus
 - Buttes
 - Plains
34. A common kind of mechanical weathering is called ?
- Oxidation
 - Ice wedging
 - Carbonation
 - Leaching
35. Chemical weathering is most rapid in ?
- Hot, dry climates
 - Cold, dry climates
 - Cold, wet climates
 - Hot, wet climates
36. Low gradient rivers have a winding pattern of curves called?
- Deltas
 - Oxbows
 - Meanders
 - Braided streams
37. The change of water vapor into liquid water is called ?
- Runoff
 - Evaporation
 - Desalination
 - Condensation
38. The land area from which water runs off into a stream is called a ?
- Tributary
 - Divide
 - Watershed
 - Gully
39. In a water budget, the income is precipitation and the expense is?
- Evapotranspiration and runoff
 - Condensation and saltation
 - Erosion and conservation
 - Conservation and sedimentation
40. One way to control floods indirectly is through?
- Soil conservation
 - Dams
 - Floodways
 - Artificial levees
41. The stream load that includes gravel and large rocks is ?
- Suspended load
 - Runoff load
 - Dissolved load
 - Bed load
42. What is the term that describes the continuous movement of water from the ocean to the atmosphere, from the atmosphere to land and from the land back to the ocean?
- Condensation
 - Evapotranspiration
 - Precipitation
 - Water cycle
43. The Largest hydroelectric dam in the world is the?
- The Hoover Dam
 - The Three Gorges Dam
 - Guri Dam
 - Aswan Dam

44. Any body of rock or sediment in which water can flow and be stored is called a(n)
- Well
 - Aquifer
 - Sinkhole
 - Artesian formation
45. The ease with which water can pass through a rock or sediment is called ?
- Permeability
 - Carbonation
 - Porosity
 - Velocity
46. The natural flow of groundwater that has reached the surface is a(n)
- Well
 - Aquifer
 - Spring
 - Travertine
47. Calcite formations that hang from the ceiling of a cavern are called
- Sinks
 - Stalactites
 - Stalagmites
 - Karst
48. Glaciers move when grains of ice deform under pressure which allow them to slide over each other resulting in uneven movement and is called ?
- Temerity
 - Sheet flow
 - Basal slip
 - Internal plastic flow
49. Due to the uneven flow of glacier movement, large cracks called _____ form.
- Ice shelves
 - Crevasses
 - Snowfields
 - Ice wedges
50. Flamelike jets of gas extending into the chromosphere are called ?
- Spicules
 - Magnetic carpets
 - Supergranules
 - Limbs
51. When water evaporates?
- There is no phase change
 - Energy is released
 - Energy is absorbed
 - Latent heat is released
52. When a solid substance transforms directly into a gas it is called?
- Evaporation
 - Condensation
 - Absolute Latency
 - Sublimation
53. The temperature at which the condensation rate equals the evaporation rate is called?
- The Dew Point
 - Absolute Humidity Point
 - Relative Humidity
 - Condensation Point
54. A tool used to measure relative humidity is a(n)
- Barometer
 - Anemometer
 - Psychrometer
 - Radiosondes
55. Particles needed for water vapor to condense in the atmosphere are called ?
- Condensation nuclei
 - Saturation substrate
 - Local Bubble Effect
 - Cold Dust
56. When warm, moist air masses like the coast of San Francisco move over a cooler surface like the Pacific Ocean, the following occurs?
- A normal temperature layer in the atmosphere
 - Precipitation
 - Advection fog that sweeps through the Golden Gate Bridge
 - Radiation fog due to radiative heat loss
57. When rain freezes when it strikes a surface near the ground _____ forms.
- Sleet
 - Glaze ice
 - Hail
 - Drizzle
58. The prefix nimbo- and the suffix -nimbus mean
- High
 - Billowy
 - Rain
 - Layered
59. Clouds in which the water droplets remain liquid below 0 degrees Celsius are said to be
- Unsaturated clouds
 - Saturated clouds
 - Superheated clouds
 - Supercooled clouds

60. When the temperature of the air decreases, the rate of evaporation
- Decreases
 - Increases
 - Stays the same
 - Varies
61. Which of the following is information that you would not find from a station model?
- Precipitation
 - Cloud cover
 - Front
 - Wind speed
62. The type of front that forms when two air masses move parallel to the front between them is called ?
- Stationary Front
 - Occluded Front
 - Polar Front
 - Warm Front
63. The eye of a hurricane is a region of
- Hailstorms
 - Torrential rainfall
 - Calm, clear air
 - Strong winds
64. An instrument package attached to a weather balloon is
- An anemometer
 - A radiosonde
 - A thermograph
 - A wind vane
65. The lines that connect points of equal atmospheric pressure on a weather map are called
- Isobars
 - Isotherms
 - Highs
 - Contour lines
66. In the mature stage of a thunderstorm, a cumulus cloud grows until it becomes a(n)?
- Stratocumulus cloud
 - Alto cumulus cloud
 - Cumulonimbus cloud
 - Cirrocumulus cloud
67. At the equator, the sun's rays always strike Earth
- At a low angle
 - At nearly a 90 degree angle
 - 18 hours each day
 - No more than 8 hours each day.
68. An example of a persistent organic pollutant (POP) seen in the ocean is
- DDT
 - Nuclear waste
 - Upwelling detritus
 - Mercury
69. Which of the following is NOT used as evidence of past climates?
- Fossils
 - Tree rings
 - Ice cores
 - General Circulation Models
70. Ocean currents influence temperature by
- Washing warm, dry sediments out to sea
 - Dispersing the rays of the sun
 - Heating or cooling the air
 - Eroding shorelines
71. Water cools
- More quickly than land does
 - More slowly than land does
 - Only during evaporation
 - During global warming
72. During each orbit around Earth, the moon spins on its axis?
- One time
 - About 29 times
 - 365 times
 - About 27 times
73. The main asteroid belt exists in a region between the orbits of
- Mars and Jupiter
 - Venus and Earth
 - Mercury and Venus
 - Earth and Mars
74. Compared with other moons of Jupiter, the four Galilean moons are
- Younger
 - Lighter
 - Larger
 - Farther from Jupiter
75. Northern lights and southern lights are other names for
- Prominences
 - Auroras
 - Granulations
 - Total Solar irradiance

TIE BREAKER:

Rank the following planets from smallest to largest number of moons:

Uranus, Mars, Jupiter, Saturn, Neptune, Pluto,

