

2024 Earth and Space Scrimmage

Round Robin 3

August 7th - 9th

TOSS-UP

1) Earth science – *Multiple Choice* Which of the following natural features is NOT formed by aeolian processes?

- W) Blowout
- X) Yardang
- Y) Bergschrund [**burg-shrund**]
- Z) Ventifact

ANSWER: Y) Bergschrund

TOSS-UP

2) Earth science – *Multiple Choice* Which of the following sequences of sediments would be most favorable for the formation of a flowing artesian well?

- W) Gravel, clay, gravel
- X) Clay, gravel, clay
- Y) Silt, sand, silt
- Z) Sand, silt, sand

ANSWER: X) Clay, gravel, clay

TOSS-UP

3) Earth science – *Short Answer* Order the following three cloud types in terms of increasing altitude of formation: 1) Noctilucent; 2) Cirrus; 3) Altocumulus.

ANSWER: 3, 2, 1

TOSS-UP

4) Space science – *Multiple Choice* Which of the following statements is INCORRECT regarding telescopes?

- W) Refracting telescopes use a main lens that focuses an image onto a secondary lens
- X) Refracting telescopes often exhibit chromatic aberration while reflecting telescopes do not
- Y) Active optics use computers to alter images to correct distorted figures
- Z) Interferometry is the process of synthesizing one image from an array of smaller telescopes

ANSWER: Y) Active optics use computers to alter optic images to correct distorted figures

TOSS-UP

5) Space science – *Short Answer* What phenomenon is responsible for the formation of an Einstein ring when light from one star bends around another massive star directly in front of it?

ANSWER: Gravitational lensing

TOSS-UP

6) Earth science – *Short Answer* Identify all of the following three circulation cells that are considered thermally indirect: 1) Walker cell; 2) Ferrel cell; 3) Polar cell.

ANSWER: 2 only

TOSS-UP

7) Space science – *Multiple Choice* During which of the following stages of a star's life is it fusing primarily helium in its core?

- W) Main sequence
- X) Red giant branch
- Y) Horizontal branch
- Z) Asymptotic giant branch

ANSWER: Y) Horizontal branch

TOSS-UP

8) Earth science – *Short Answer* Identify all of the following four latitudes in the Northern Hemisphere that typically contain high pressure zones: 1) 0 degrees; 2) 30 degrees; 3) 60 degrees; 4) 90 degrees.

ANSWER: 2 and 4

TOSS-UP

9) Earth science – *Multiple Choice* Rocks deposited in which of the following environments would likely be most conducive to the formation of karst topography?

- W) Alluvial
- X) Fluvial
- Y) Shallow marine
- Z) Deep marine

ANSWER: Y) Shallow marine

TOSS-UP

10) Space science – *Short Answer* Order the following three solar system planets in terms of increasing magnetic field strength: 1) Jupiter; 2) Earth; 3) Mars.

ANSWER: 3, 2, 1

TOSS-UP

11) Earth science – *Multiple Choice* Which of the following sets of conditions is ideal for peat formation?

- W) High water table, high oxygen content
- X) High water table, low oxygen content
- Y) Low water table, high oxygen content
- Z) Low water table, low oxygen content

ANSWER: X) High water table, low oxygen content

TOSS-UP

12) Space science – *Multiple Choice* Which of the following best describes the movement of a two solar mass star on the HR diagram after it undergoes a helium flash?

- W) Up and to the left
- X) Up and to the right
- Y) Down and to the left
- Z) Down and to the right

ANSWER: Y) Down and to the left

TOSS-UP

13) Space science – *Short Answer* Before Planck’s law correctly derived the energy emitted by a perfect blackbody, what law was used, which correctly approximated low-frequency emissions but incorrectly predicted an infinite release of radiation at high frequencies?

ANSWER: Rayleigh-Jeans law

TOSS-UP

14) Earth science – *Short Answer* Identify all of the following three statements that are true regarding solifluction: 1) Solifluction commonly occurs in the active layer; 2) Soil undergoing solifluction moves several meters per day; 3) Solifluction is promoted in areas with a permeable bedrock layer.

ANSWER: 1 only

TOSS-UP

15) Earth science – *Short Answer* Identify all of the following three features that are typically associated with submergent coastlines: 1) Fjords; 2) Estuaries; 3) Marine terraces.

ANSWER: 1 and 2

TOSS-UP

16) Space science – *Short Answer* Pan and Prometheus are moons that clear visible gaps in Saturn’s rings due to their gravitational influence, thus making them what kind of moons?

ANSWER: Shepherd moons

TOSS-UP

17) Earth science – *Multiple Choice* Many heavy metals are mined from sulfide ores formed in magmatic or hydrothermal deposits. Which of the following metal ores is NOT a sulfide?

- W) Cinnabar
- X) Corundum
- Y) Galena
- Z) Sphalerite

ANSWER: X) Corundum

TOSS-UP

18) Earth science – *Short Answer* When the angle of repose is exceeded on cliffs, sediment and debris succumb to gravity and fall to the base. What term describes the accumulation of debris at the bottom of these cliffs?

ANSWER: Talus deposits (ACCEPT: Scree, Talus slopes)

TOSS-UP

19) Earth science – *Multiple Choice* In which of the following tectonic environments would a trellis drainage pattern most likely form?

- W) Basin and range
- X) Rift valley
- Y) Volcanic arc
- Z) Stable craton

ANSWER: W) Basin and range

TOSS-UP

20) Space science – *Short Answer* In the Lambda-CDM model, lambda refers to the presence of what constant, which is used in general relativity to model the accelerating expansion of the universe and is often associated with dark energy?

ANSWER: Cosmological constant