NATIONAL ROUND ROBIN - 3

TOSS-UP

1. **MATH; Multiple Choice: In the equation g(x) = the integral of f(x)dx, the integrand is**

   (W) g(x).
   (X) dx.
   (Y) f(x).
   (Z) undefined.

   ANSWER: Y– F (X)

BONUS

1. **MATH; Short Answer: Approximating the value of an integral by the sum of area of rectangles is called what kind of sum?**

   ANSWER: RIEMANN (SUM)

TOSS-UP

2. **PHYS; Multiple Choice: The idea that the Earth is a magnet was proposed by**

   (W) Gilbert.
   (X) Oersted.
   (Y) Faraday.
   (Z) Ohm.

   ANSWER: W– GILBERT

BONUS

2. **PHYS; Multiple Choice: Electric current is supplied to the commutator of a motor through the**

   (W) armatures.
   (X) solenoids.
   (Y) transformers.
   (Z) brushes.

   ANSWER: Z– BRUSHES

TOSS-UP

3. BIOL; Short Answer: Three uracil bases are the codon for what amino acid?

ANSWER: PHENYLALANINE (Phe)

BONUS

3. BIOL; Short Answer: If two hybrid pea plants have 120 offspring, according to the laws of chance, how many offspring will display the dominant trait?

ANSWER: 90

TOSS-UP

4. CHEM; Multiple Choice: The reaction of amines with carboxylic acids forms

(W) alcohols.
(X) esters.
(Y) amides.
(Z) proteins.

ANSWER: Y– AMIDES

BONUS

4. CHEM; Multiple Choice: The boiling temperatures of the aldehydes and ketones are lower than the boiling temperatures of the alcohols because

(W) aldehydes and ketones have such low vapor pressures.
(X) there is no intermolecular attraction in aldehydes and ketones.
(Y) the size of the aldehyde and ketone molecules is large.
(Z) no hydrogen bonding occurs in aldehydes and ketones.

ANSWER: Z– NO HYDROGEN BONDING OCCURS IN ALDEHYDES AND KETONES

TOSS-UP

5. COMP; Multiple Choice: A Java compiler creates

(W) JNI.
(X) native machine code.
(Y) byte-code.
(Z) JVM.

ANSWER: Y– BYTE-CODE

BONUS

5. COMP; Multiple Choice: The original IBM PC, with an 8088 microprocessor, had a maximum clock speed of

(W) 33 MegaHertz.
(X) 25 MegaHertz.
(Y) 14.4 MegaHertz.
(Z) 8 MegaHertz.

ANSWER: Z– 8 MEGAHERTZ

TOSS-UP

6. BIOL; Short Answer: Albinism, characterized by the absence of melanin, results from the absence of what enzyme?

ANSWER: TYROSINASE

BONUS

6. BIOL; Short Answer: Suppose an organism inherits three dominant chromosomes from its father and three matching recessive chromosomes from its mother. According to the laws of chance, how many new combinations are possible in the gametes formed during gametogenesis?

ANSWER: 8

TOSS-UP

7. PHYS; Multiple Choice: Magnetic domains are regions

(W) where the magnetic field strength is decreased.
(X) in unmagnetized materials only.
(Y) of random arrangement.
(Z) where magnetic fields are grouped together.

ANSWER: Z– WHERE MAGNETIC FIELDS ARE GROUPED TOGETHER

BONUS

7. PHYS; Multiple Choice: When magnetic domains of an object become randomly arranged, the object

(W) gains magnetic properties.
(X) loses magnetic properties.
(Y) becomes a north pole.
(Z) becomes part of a magnetic field.

ANSWER: X– LOSES MAGNETIC PROPERTIES

TOSS-UP

8. CHEM; Multiple Choice: Which of the following compounds has two hydrocarbon groups bonded to an oxygen atom?

(W) alcohol
(X) amine
(Y) ketone
(Z) ether

ANSWER: Z– ETHER

BONUS

8. CHEM; Multiple Choice: Compounds with an oxygen atom bonded to two hydrocarbon groups generally have boiling temperatures below that of

(W) alcohols.
(X) hydrocarbons.
(Y) both alcohols and hydrocarbons.
(Z) neither alcohols nor hydrocarbons.

ANSWER: W– ALCOHOLS

TOSS-UP

9. ASTR; Multiple Choice: The reflection of sunlight is very dependent upon the reflection from a celestial body's surface and cloud cover. This measurement is called

(W) albedo.
(X) vertigo.
(Y) earthlight.
(Z) sunlight.

ANSWER: W– ALBEDO

BONUS

9. ASTR; Multiple Choice: The term "blue moon" refers to

(W) halos of reflecting light surrounding the moon.
(X) second occurrence of a full moon during a single month.
(Y) the light spectra influencing the moon viewing.
(Z) the fact that the moon is made of blue cheese.

ANSWER: X– SECOND OCCURRENCE OF A FULL MOON DURING A SINGLE MONTH

TOSS-UP

10. PHYS; Multiple Choice: In a telephone, the part that changes sound waves into electric current is

(W) the receiver.
(X) the transmitter.
(Y) an electromagnet.
(Z) the switchboard.

ANSWER: X– THE TRANSMITTER

BONUS

10. PHYS; Multiple Choice: Which of the following parts of a telephone have now been replaced by semiconductors?

(W) Carbon grains in the transmitter
(X) Metal disk in the receiver
(Y) Electromagnet in the receiver
(Z) Carbon grains in the transmitter and an electromagnet in the receiver

ANSWER: Z– CARBON GRAINS IN THE TRANSMITTER AND AN ELECTROMAGNET IN THE RECEIVER

TOSS-UP

11. CHEM; Multiple Choice: With respect to the hydrocarbon chain, where is the carbonyl group in an aldehyde located?

(W) in the middle of the chain
(X) in the interior of the chain
(Y) anywhere on the chain
(Z) at the end of the chain

ANSWER: Z– AT THE END OF THE CHAIN

BONUS

11. CHEM; Multiple Choice: The number prefix is not used when naming an aldehyde because

(W) all aldehydes have the same composition.
(X) only one aldehyde is known to exist.
(Y) the carbonyl group is always at the end of the chain.
(Z) the functional group is free to move along the chain.

ANSWER: Y– THE CARBONYL GROUP IS ALWAYS AT THE END OF THE CHAIN

TOSS-UP

12. BIOL; Short Answer: What phyla consists of five classes, including insects and arachnids?

ANSWER: ARTHROPODA

BONUS

12. BIOL; Short Answer: In human beings, brown eyes are usually dominant over blue eyes. Suppose that a blue-eyed man marries a brown-eyed woman whose father is blue-eyed. By the laws of chance, how many of their four offspring should be blue-eyed?

ANSWER: 2

TOSS-UP

13. ERSC; Multiple Choice: What forms when streams enter bodies of standing water, undergo an abrupt loss of velocity, and drop their load of sediment?

(W) Alluvial fans
(X) Taluscones
(Y) Vasnes
(Z) Deltas

ANSWER: Z– DELTAS

BONUS

13. ERSC; Short Answer: The process of converting sediment into sedimentary rock is termed

ANSWER: LITHIFICATION

TOSS-UP

14. CHEM; Multiple Choice: The functional group that identifies an ester is similar to the carboxyl group except that the hydrogen of the carboxyl group is replaced by a

(W) hydrocarbon group.
(X) hydroxyl group.
(Y) carbonyl group.
(Z) halogen group.

ANSWER: W– HYDROCARBON GROUP

BONUS

14. CHEM; Multiple Choice: The IUPAC (pron: I-U-PAC) name for formaldehyde is

(W) methanone.
(X) acetal.
(Y) methanal.
(Z) propanone.

ANSWER: Y– METHANAL

TOSS-UP

15. PHYS; Multiple Choice: In 1798, Count Rumford used the scientific method to prove that

(W) heat is a substance.
(X) heat is caloric.
(Y) heat is not a substance.
(Z) objects in motion do not produce heat.

ANSWER: Y– HEAT IS NOT A SUBSTANCE

BONUS

15. PHYS; Multiple Choice: The relationship between heat and motion was investigated by

(W) Rumford.
(X) Kelvin.
(Y) Joule.
(Z) Celsius.

ANSWER: Y– JOULE

TOSS-UP

16. BIOL; Short Answer: What is the term for the accumulation of organic matter in lakes due to overfertilization by minerals from the land?

ANSWER: EUTROPHICATION

BONUS

16. BIOL; Short Answer: What is the term for mimicry when a harmless or defenseless species has developed identical shape, coloration, or other features similar to a poisonous or noxious species?

ANSWER: BATESIAN

TOSS-UP

17. CHEM; Multiple Choice: Biological catalyst proteins are called

(W) nucleic acids.
(X) phospholipids.
(Y) vitamins.
(Z) enzymes.

ANSWER: Z– ENZYMES

BONUS

17. CHEM; Multiple Choice: The scientific name for milk sugar is

(W) glucose.
(X) lactose.
(Y) ribose.
(Z) cellulose.

ANSWER: X– LACTOSE

TOSS-UP

18. MATH; Multiple Choice: A number that can be expressed in the form p / q, where p and q are integers and q is not equal to zero, is a

(W) integer.
(X) irrational number.
(Y) imaginary number.
(Z) rational number.

ANSWER: Z– RATIONAL NUMBER

BONUS

18. MATH; Short Answer: How many distinct ways are there to paint a cube with six different colors without painting two faces with the same color?

ANSWER: 30

TOSS-UP

19. ASTR; Multiple Choice: A satellite above the earth's equator, at a distance of 22,300 miles, will appear stationary from the ground and we say it is in

(W) parallel orbit.
(X) accelerating orbit.
(Y) ecliptic orbit.
(Z) geosynchronous orbit.

ANSWER: Z– GEOSYNCHRONOUS ORBIT

BONUS

19. ASTR; Multiple Choice: The Hubble Space Telescope has the advantage of being serviceable by the space shuttle, but this is a disadvantage also because

(W) it must be in a low orbit and nothing can be viewed for long periods.
(X) it is affected by earth light scattering.
(Y) it can view only pointed in one direction.
(Z) it can observe only in the ultraviolet light regions.

ANSWER: W– IT MUST BE IN A LOW ORBIT AND NOTHING CAN BE VIEWED FOR LONG PERIODS

TOSS-UP

20. BIOL; Short Answer: Which of the Tracheophytes, utilizes flowers as a reproductive organ?

ANSWER: ANGIOSPERMS

BONUS

20. BIOL; Short Answer: Which of the angiosperms has flowering parts are in multiples of three?

ANSWER: MONOCOTS

TOSS-UP

21. GENR; Short Answer: What is another name for the Paleolithic Age?

ANSWER: THE STONE AGE

BONUS

21. GENR; Multiple Choice: Solar energy is the world's most abundant source of energy. The amount of solar energy intercepted by earth is about how many times greater than the sum of all other sources of energy?

(W) 500
(X) 1,000
(Y) 5,000
(Z) 10,000

ANSWER: Y-- 5,000

TOSS-UP

22. ERSC; Short Answer: Hues of brown, red, and green often occur in sedimentary rocks as a result of what chemical?

ANSWER: IRON OXIDE

BONUS

22. ERSC; Short Answer: Strata colored in shades of red, brown, or purple by ferric oxide are given what designation by geologists?

ANSWER: RED BEDS

-

TOSS-UP

23. PHYS; Short Answer: Information is carried by AM radio waves as a pattern of changes in

ANSWER: AMPLITUDE

BONUS

23. PHYS; Multiple Choice: In a cathode-ray tube

(W) the electron beam is controlled by electromagnets.
(X) about one picture per second is produced.
(Y) the fewer the number of electrons striking the screen, the brighter the light the screen gives off.
(Z) the fluorescent material on the screen causes the electrons to move up and down the screen.

ANSWER: W– THE ELECTRON BEAM IS CONTROLLED BY ELECTROMAGNETS

TOSS-UP

24. COMP; Short Answer: How many bytes does a double-precision real variable require in FORTRAN?

ANSWER: 16

BONUS

24. COMP; Multiple Choice: What is the decimal value of the largest unsigned number that can be stored in 16 bit register.

(W) 65535
(X) 32769
(Y) 32767
(Z) 64001

ANSWER: W– 65535

TOSS-UP

25. GENR; Short Answer: What is the name of the largest North American terrestrial rodent, distinguished by its spiny covering?

ANSWER: PORCUPINE

BONUS

25. GENR; Multiple Choice: Bees must collect nectar from approximately how many flowers to make 1 pound of honeycomb?

(W) 10 thousand
(X) 2 million
(Y) 20 million
(Z) 50 million

ANSWER: Y– 20 MILLION