1) BIOLOGY *Multiple Choice* Which class of flatworms are free-living?

W) Monogenea

X) Trematoda

Y) Turbellaria

Z) Cestoda

ANSWER: Y) Turbellaria

2) BIOLOGY *Short Answer* What are the sixth class of plant hormones that promote cell expansion and cell elongation along with auxin?

ANSWER: Brassinosteroids

3) BIOLOGY *Short Answer* Aquatic osteichthyes have what protective bony flap that covers the chambers of the gills?

ANSWER: Operculum

4) CHEMISTRY *Short Answer* What is the systematic name for K3Fe(CN)6?

ANSWER: Potassium hexacyanoferrate (III)

5) CHEMISTRY *Short Answer* What equation gives the relationship between the cell potential and concentrations of the cell components?

ANSWER: Nernst equation

6) CHEMISTRY *Multiple Choice* What is the common name of C55H70O6N4Mg?

W) Chlorophyll a

X) Chlorophyll b  
Y) Chlorophyll c

Z) Chlorophyll d

ANSWER: X) Chlorophyll b

7) CHEMISTRY *Multiple Choice* What is the electron configuration of the chromium atom?

ANSWER: [Ar] 4s13d5 (ACCEPT: 1s22s22p63s23p64s13d5)

8) PHYSICS *Short Answer* If the length of a pendulum is 10 meters, assume g = 10 m/s^2, what is the period of the pendulum?

ANSWER: 6.28 seconds

9) PHYSICS *Short Answer* What is obtained when a planoconvex lens is placed on top of a flat glass surface?

ANSWER: Newton’s rings

10) PHYSICS *Short Answer* What empirical diffraction limit is given when the images of two different points are just resolved when the principal diffraction maximum of one image coincides with the first minimum of the other?

ANSWER: Rayleigh criterion

11) PHYSICS *Multiple Choice* Suppose Young’s experiment is carried out in air then in water. How does the distance between bright fringes change?

W) They move closer together.

X) They move farther apart.

Y) There is no change.

Z) The experiment cannot be performed underwater.

ANSWER: W) They move closer together.

12) ASTRONOMY *Short Answer* Photographs of the photosphere have a mottled appearance because of what phenomenon?

ANSWER: Granulation

13) ASTRONOMY *Multiple Choice* Where are Red dwarfs on the H-R diagram?

W) Top left

X) Top right

Y) Lower left

Z) Lower right

ANSWER: Z) Lower right

14) ASTRONOMY *Multiple Choice* Einstein added what constant to his equations that balances the gravitation in the universe?

ANSWER: Cosmological constant

15) EARTH SCIENCE *Multiple Choice* What are the primary nutrients in soil?

ANSWER: Nitrogen, Phosphorus, Potassium

16) EARTH SCIENCE *Multiple Choice* What type of carbon is used for water treatment and deodurisation?

W) Granular activated carbon

X) Powdered activated carbon

Y) Extruded activated carbon

Z) Impregnated carbon

ANSWER: W) Granular activated carbon

17) EARTH SCIENCE *Multiple Choice* What is the distance between star north and magnetic north?

ANSWER: Magnetic declination

18) MATH *Short Answer* What is the integral of 2sin(x)cos(x)?

ANSWER: -2cos(2x)

19) MATH *Short Answer* What is equal to (e2x+1)/(e2x-1)

ANSWER: coth x

20) MATH *Short Answer* What theorem states that a separation of a plane into a map can be colored so that no two adjacent regions have the same color?

ANSWER: Four color theorem

21) MATH *Short Answer* What is a pair (X,T) where X is a set and T is a subset of the power set of X?

ANSWER: Topological space

22) GENERAL SCIENCE *Multiple Choice* A blue paper is lit by a red light passed through a green filter. What color does the paper appear to be?

W) Red

X) Green

Y) Blue  
Z) Black

ANSWER: Z) Black

23) GENERAL SCIENCE *Short Answer* What is the fear of prescribing pain medications for patients?

ANSWER: Opiophobia

24) GENERAL SCIENCE *Short Answer* What fuel is produced by heating wood without the presence of oxygen?

ANSWER: Charcoal

25) GENERAL SCIENCE *Short Answer* Which trees provide resin for turpentine?

ANSWER: Pine trees