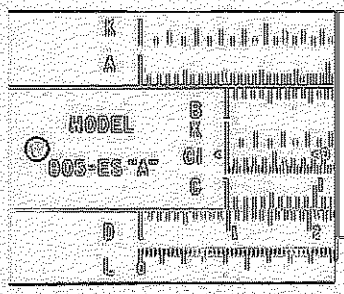


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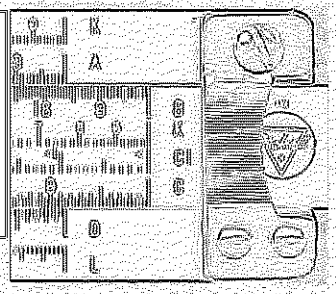
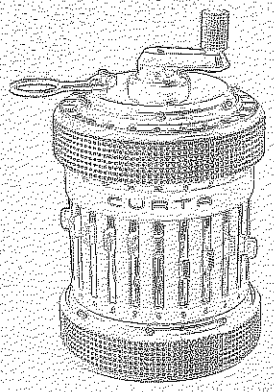
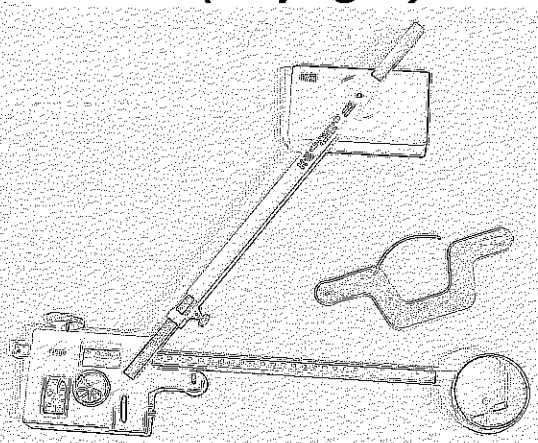
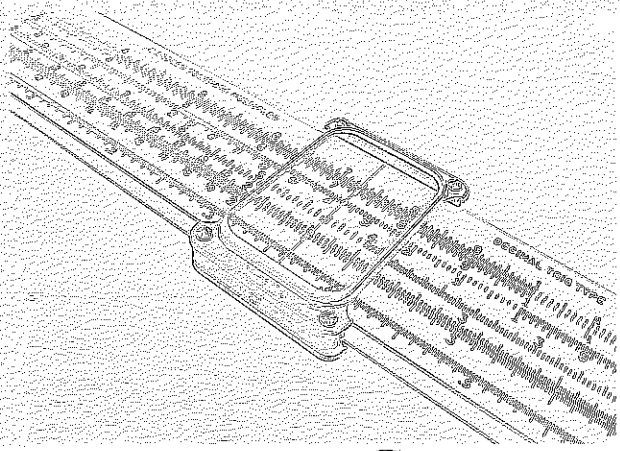
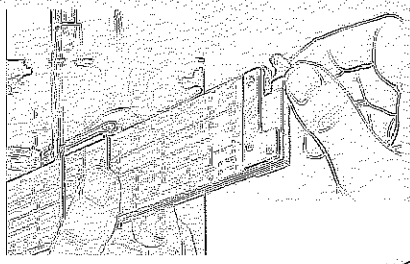


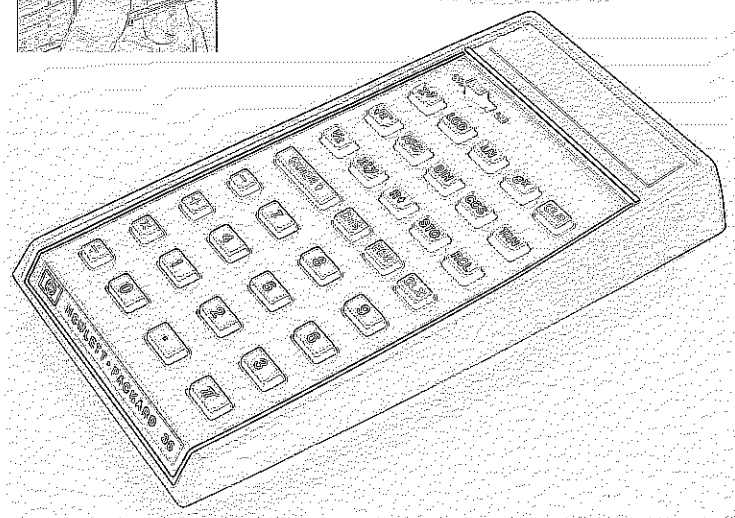
# *2008 UIL Science "A" Test*
# *(11 pages)*

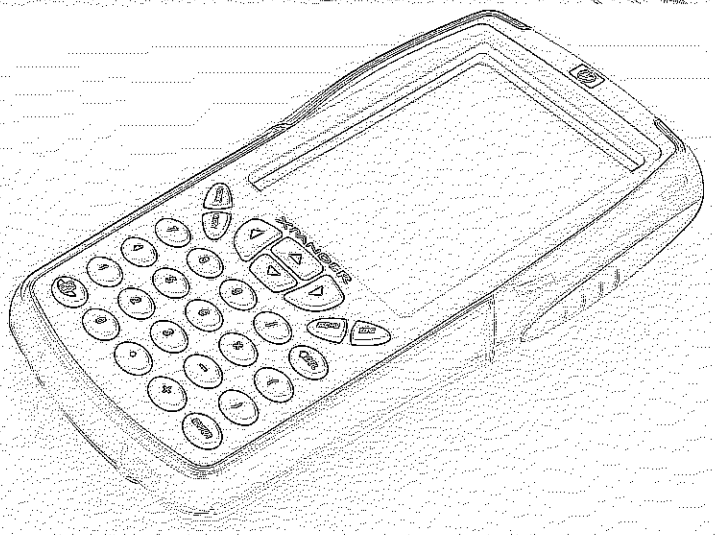


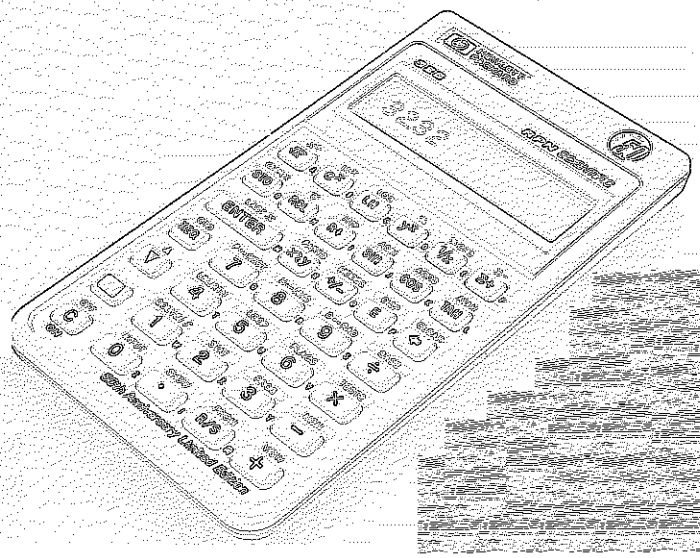



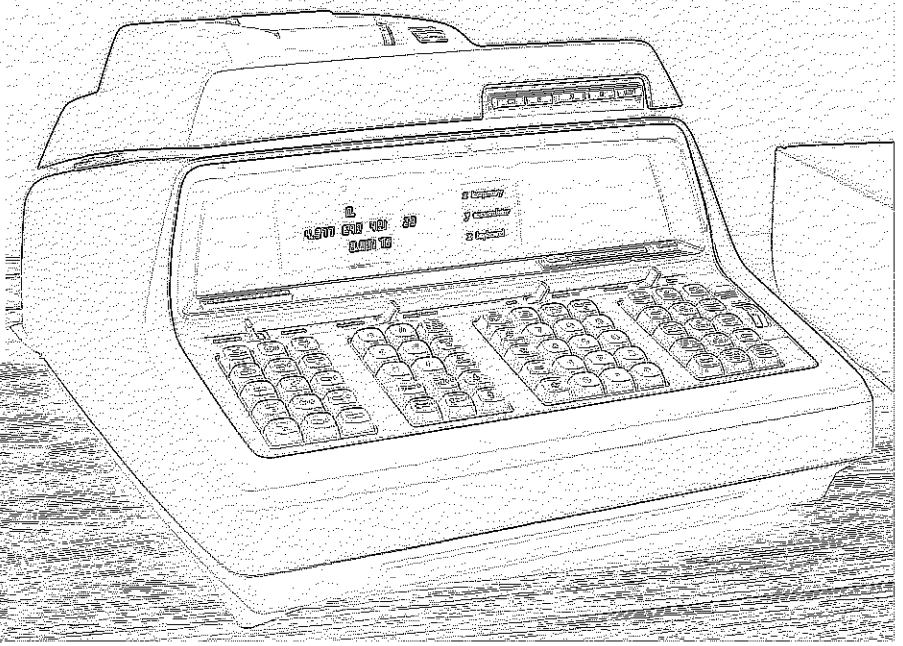












# SCIENCE

## Invitational A • 2008

GENERAL DIRECTIONS:

- DO NOT OPEN EXAM UNTIL TOLD TO DO SO.
- Ninety minutes should be ample time to complete this contest, but since it is not a race, contestants may take up to two hours. If you are in the process of actually writing an answer when the signal to stop is given, you may finish writing that answer.
- Papers may not be turned in until 30 minutes have elapsed. If you finish the test in less than 30 minutes, remain at your seat and retain your paper until told to do otherwise. You may use this time to check your answers.
- All answers must be written on the answer sheet provided. Indicate your answers in the appropriate blanks provided on the answer sheet.
- You may place as many notations as you desire anywhere on the test paper except on the answer sheet, which is reserved for answers only.
- You may use additional scratch paper provided by the contest director.
- All questions have ONE and only ONE correct (BEST) answer. There is a penalty for all incorrect answers.
- If a question is omitted, no points are given or subtracted.
- On the back of this page is printed a copy of the periodic table of the elements. You may wish to refer to this table in answering the questions, and if needed, you may use the atomic weights and atomic numbers from the table. Other scientific relationships are listed also.
- Silent hand-held calculators that do not need external wall plugs may be used. Graphing calculators that do not have built-in or stored functionality that provides additional scientific information are allowed. Small hand-held computers are not permitted. Calculators that accept memory cards or memory sticks are not permitted. Each contestant may bring one spare calculator. All memory must be cleared.
- Answers within 5% of the exact answer will be considered correct.

SCORING:

All questions will receive 6 points if answered correctly; no points will be given or subtracted if unanswered; 2 points will be deducted for an incorrect answer.

**UNIVERSITY INTERSCHOLASTIC LEAGUE**

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# Periodic Table of the Elements

| 1A | | | | | | | | | | | | 3A | 4A | 5A | 6A | 7A | 8A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 H 1.008 | 2A | | | | | | 8B | | | 1B | 2B | | | | | | 2 He 4.003 |
| 3 Li 6.941 | 4 Be 9.012 | | | | | | | | | | | 5 B 10.81 | 6 C 12.01 | 7 N 14.01 | 8 O 16.00 | 9 F 19.00 | 10 Ne 20.18 |
| 11 Na 23.00 | 12 Mg 24.31 | 3B | 4B | 5B | 6B | 7B | | | | 1B | 2B | 13 Al 26.98 | 14 Si 28.09 | 15 P 30.97 | 16 S 32.06 | 17 Cl 35.45 | 18 Ar 39.95 |
| 19 K 39.10 | 20 Ca 40.08 | 21 Sc 44.96 | 22 Ti 47.90 | 23 V 50.94 | 24 Cr 52.00 | 25 Mn 54.94 | 26 Fe 55.85 | 27 Co 58.93 | 28 Ni 58.70 | 29 Cu 63.55 | 30 Zn 65.38 | 31 Ga 69.72 | 32 Ge 72.59 | 33 As 74.92 | 34 Se 78.96 | 35 Br 79.90 | 36 Kr 83.80 |
| 37 Rb 85.47 | 38 Sr 87.62 | 39 Y 88.91 | 40 Zr 91.22 | 41 Nb 92.91 | 42 Mo 95.94 | 43 Tc (98) | 44 Ru 101.1 | 45 Rh 102.9 | 46 Pd 106.4 | 47 Ag 107.9 | 48 Cd 112.4 | 49 In 114.8 | 50 Sn 118.7 | 51 Sb 121.8 | 52 Te 127.6 | 53 I 126.9 | 54 Xe 131.3 |
| 55 Cs 132.9 | 56 Ba 137.3 | 57 La 138.9 | 72 Hf 178.5 | 73 Ta 180.9 | 74 W 183.9 | 75 Re 186.2 | 76 Os 190.2 | 77 Ir 192.2 | 78 Pt 195.1 | 79 Au 197.0 | 80 Hg 200.6 | 81 Tl 204.4 | 82 Pb 207.2 | 83 Bi 209.0 | 84 Po (209) | 85 At (210) | 86 Rn (222) |
| 87 Fr (223) | 88 Ra 226.0 | 89 Ac 227.0 | 104 Rf (261) | 105 Ha (262) | 106 Unh (263) | 107 Uns (262) | | 109 Une (267) | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lanthanides | 58 Ce 140.1 | 59 Pr 140.9 | 60 Nd 144.2 | 61 Pm (145) | 62 Sm 150.4 | 63 Eu 152.0 | 64 Gd 157.3 | 65 Tb 158.9 | 66 Dy 162.5 | 67 Ho 164.9 | 68 Er 167.3 | 69 Tm 168.9 | 70 Yb 173.0 | 71 Lu 175.0 |
| Actinides | 90 Th 232.0 | 91 Pa 231.0 | 92 U 238.0 | 93 Np 237.0 | 94 Pu (244) | 95 Am (243) | 96 Cm (247) | 97 Bk (247) | 98 Cf (251) | 99 Es (252) | 100 Fm (257) | 101 Md (258) | 102 No (259) | 103 Lr (260) |

## OTHER USEFUL INFORMATION

Acceleration of gravity at Earth's surface, $g = 9.81\ m/s^2$

Avogadro's Number, $N = 6.02 \times 10^{23}$ molecules/mole

Planck's constant, $h = 6.63 \times 10^{-34}\ J \cdot s$

Planck's reduced constant, $\hbar \equiv {}^{h}/_{2\pi} = 1.05 \times 10^{-34}\ J \cdot s$

Standard temperature and pressure (STP) is 0°C and 1 atmosphere

Gram molecular volume at STP = 22.4 liters

Velocity of light, $c = 3.0 \times 10^{8}$ m/sec

Absolute zero = 0 K = −273.15°C

Gas constant, R = 1.986 cal/K•mole = 0.082 liter•atm/K•mole

One Faraday = 96,500 coulombs ($9.65 \times 10^{4}$ C)

Dulong and Petit's constant = 6.0 amu•cal/gram•K

Electron rest mass, $m_e = 9.11 \times 10^{-31}$ kg

Atomic mass unit, $m_a = 1.66 \times 10^{-27}$ kg

Boltzmann constant, $k_B = 1.38 \times 10^{-23}\ J/K$

Permittivity of free space $\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/N \cdot m^2$

Permeability of free space $\mu_0 = 4\pi \times 10^{-7}\ T \cdot m/A$

1 Atmosphere = $1.02 \times 10^{5}\ N/m^2$ = 760 Torr = 760 mmHg

1 Electron Volt = $1.6 \times 10^{-19}$ Joules

Charge of an electron = $-1.6 \times 10^{-19}$ coulombs (C)

1 horsepower (hp) = 746 W = 550 ft•lb/s

Neutron Mass = 1.008665 au

Proton Mass = 1.007277 au

1 au = 931.5 MeV

1 calorie = 4.184 Joules (J)

Specific heat of water = 4.18 J/g•°C

## Biology Questions (1 – 20)

1. The three most common atoms in your body are ____.
   A) carbon, oxygen, and sulfur
   B) hydrogen, oxygen, and carbon
   C) carbon, nitrogen, and oxygen
   D) nitrogen, hydrogen, and oxygen
   E) carbon, hydrogen, and nitrogen

2. Which of the following contain enzymes and are the main organelles of digestion within cells?
   A) Golgi bodies
   B) ribosomes
   C) mitochondria
   D) lysosomes
   E) endoplasmic reticulum

3. The light-dependent reactions of photosynthesis ____.
   A) involve photolysis of water
   B) occur in mitochondria
   C) fix carbon dioxide
   D) occur in the outer chloroplast membrane
   E) involve the capture of light energy but not electron transport chains

4. Major reshuffling of genes occurs during ____.
   A) anaphase of meiosis I
   B) anaphase of meiosis II
   C) prophase of meiosis I
   D) prophase of meiosis II
   E) mitosis

5. Which of the following describes what most people believed in Mendel's time?
   A) All genetic traits breed true.
   B) Only certain forms of domesticated plants and animals breed true.
   C) The characteristics of parents are blended in the offspring.
   D) Acquired characteristics are inherited.
   E) The inheritance of traits is controlled by the blood.

6. DNA from bacteria differs from DNA in humans in which of the following ways?
   A) base composition
   B) sugar-phosphate linkage
   C) nucleotide sequence
   D) bonding of the helix
   E) All of the above

7. Which of the following is true of bacteria?
   A) They are diploid organisms.
   B) They have circular DNA molecules.
   C) They produce gametes.
   D) They are eukaryotic.
   E) All of the above

8. The classification of fungi is based on their ____.
   A) biochemistry
   B) method of obtaining nutrients
   C) morphology
   D) method of locomotion
   E) method of sexual reproduction

9. Which of the following would not be associated with vascular plants?
   A) root systems
   B) shoot systems
   C) angiosperms
   D) gymnosperms
   E) bryophytes

10. The plant tissue that carries out photosynthesis and stores materials is ____.
    A) vascular cambium
    B) collenchyma
    C) sclerenchyma
    D) parenchyma
    E) pericycle

11. Which of the following elements required by plants is NOT obtained directly from the soil?
    A) nitrogen
    B) hydrogen
    C) carbon
    D) iron
    E) sulfur

12. Which of the following is the male reproductive part of a flower?
    A) carpel
    B) sepal
    C) petal
    D) stamen
    E) receptacle

13. In humans and other animals, which germ layer produces the nervous system?
    A) ectoderm
    B) endoderm
    C) gastroderm
    D) mesoderm
    E) all of the germ layers

14. Vegetarians need to choose the foods they eat carefully to get the necessary ____.
    A) vitamins
    B) minerals
    C) amino acids
    D) carbohydrates
    E) fatty acids

15. Most of the oxygen in human blood is carried by ____.
    A) plasma
    B) serum
    C) platelets
    D) hemoglobin
    E) iron

16. The simplest nerve pathway ____.
    A) is located in the midbrain
    B) is the reflex arc
    C) is located in the brainstem
    D) is located in the autonomic nervous system
    E) is in the peripheral nervous system

17. The gas that makes up most of the air we breath is ____.
    A) oxygen
    B) water vapor
    C) nitrogen
    D) carbon dioxide
    E) carbon monoxide

18. The first disease for which a vaccine was developed was ____.
    A) the plague
    B) smallpox
    C) rabies
    D) anthrax
    E) diphtheria

19. Which of the following types of mutations are NOT subject to natural selection?
    A) lethal
    B) physiological
    C) morphological
    D) beneficial
    E) neutral

20. By definition, which of the following is NOT a part of a community?
    A) bacteria
    B) populations
    C) animals
    D) soil
    E) plants

**Chemistry Questions (21 – 40)**

21. All of the following are examples of physical changes, except for ____.
    A) the burning of a match
    B) the boiling of mercury
    C) diluting a salt solution
    D) the breaking of a pencil
    E) melting ice

22. The molar heat of fusion of water is 6.02 kJ/mol. Calculate the energy required to melt 14.0 g of water.
    A) 4.68 kJ
    B) 7.74 kJ
    C) 6.02 kJ
    D) 84.3 kJ
    E) 9.02 kJ

23. The symbols Fe, Hg, N, Au, and Ne refer to the following elements:
    A) fluorine, hydrogen, nitrogen, gold, neon
    B) iron, mercury, nitrogen, silver, neon
    C) iron, mercury, nitrogen, gold, neon
    D) fluorine, mercury, nickel, silver, neon
    E) iron, hydrogen, nickel, gold, nitrogen

24. An analysis of a compound showed it contained 87.4% nitrogen and 12.6% hydrogen, by weight. The molecular weight was determined to be 32.05 g/mol. What is the molecular formula for this compound?
    A) $N_2H_4$
    B) $NH_2$
    C) $NH_3$
    D) cannot be determined from the information given
    E) $N_2H_2$

25. Balance the equation ? ZnO + ? HCl → ? $ZnCl_2$ + ? $H_2O$, using the smallest possible integers. The coefficient of HCl is ____.
    A) 4
    B) 0.5
    C) 3
    D) 2
    E) 1

26. Predict the products when you mix silver nitrate(s) and potassium chloride(s) with enough water to dissolve both.
    A) $KNO_3(aq)$, $AgCl(aq)$
    B) $KAg(aq)$, $NO_3Cl(aq)$
    C) $ClNO_3(aq)$, $K_2O(aq)$
    D) $KNO_3(s)$, $AgCl(aq)$
    E) $KNO_3(aq)$, $AgCl(s)$

27. Give the name and symbol for the element which has mass number 64 and 35 neutrons.
    A) $_{35}{}^{64}Cu$
    B) $_{64}{}^{29}Gd$
    C) $_{29}{}^{35}Br$
    D) $_{29}{}^{64}Cu$
    E) $_{64}{}^{99}Gd$

28. In a given atom, what is the largest possible number of 3p electrons?
    A) 10
    B) 18
    C) 6
    D) 5
    E) 2

29. A neutral isolated atom has the ground state configuration: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$ in its ground state. Identify the element.
    A) cobalt
    B) Cannot be answered without more information.
    C) argon
    D) phosphorus
    E) vanadium

30. Which of the following molecules contains both covalent and ionic bonding?
    A) KF
    B) $CH_4$
    C) $NaNO_3$
    D) $CO_2$
    E) $C_2F_4$

31. Given that the distance between bases on a baseball diamond (a perfect square) is 90 feet and the pitchers mound is one-half the distance between home and second base. If the pitcher throws a curve ball at 95 miles per hour, how many seconds will it take for the ball to reach home plate?
    A) 1.0 sec
    B) 0.5 sec
    C) 0.2 sec
    D) 0.1 sec
    E) 0.05 sec

32. The heat of fusion of a metal is 6.816 joules/gram at its freezing point of 369.0°F. How many kilojoules of energy are required to melt 637.4 grams of this metal ?
    A) 9.6 kj
    B) 4.3 kj
    C) 7.8 kj
    D) 1.7 kj
    E) 3.0 kj

33. How many moles of hydrogen are present in a 13.36 liter container at a pressure of 914. torr at 91.8°C. ?
    A) 0.375 mol
    B) 0.965 mol
    C) 0.536 mol
    D) 0.751 mol
    E) 1.180 mol

34. How many hydrogen nuclei in 0.1673 moles of $H_2SO_4$ ?
    A) $1.612 \times 10^{22}$
    B) $3.022 \times 10^{22}$
    C) $3.022 \times 10^{24}$
    D) $8.058 \times 10^{22}$
    E) $2.015 \times 10^{23}$

35. What is the % carbon, by weight, in 1.973 grams of potassium carbonate?
    A) 3.5 %
    B) 6.1 %
    C) 8.7 %
    D) 15.6 %
    E) 19.1 %

36. For the reaction ? $FeCl_2$ + ? $Na_3PO_4$ → ? $Fe_3(PO_4)_2$ + ? NaCl, a maximum of ____ grams of $Fe_3(PO_4)_2$ could be formed from 8.181 grams of $FeCl_2$ and 6.140 grams of $Na_3PO_4$.
    A) 8.0 g
    B) 7.7 g
    C) 7.3 g
    D) 7.0 g
    E) 6.7 g

37. What is the molar concentration of ammonia in a solution in which there are 0.1792 grams of ammonia per 262 milliliters of solution?
    A) 0.09 M
    B) 0.08 M
    C) 0.06 M
    D) 0.04 M
    E) 0.03 M

38. The freezing point depression constant of water is 1.86°C/m. What is the expected freezing point of a sodium chloride solution made from 0.125 moles of sodium chloride and 2.0 liters of water?
    A) –0.37°C
    B) –0.23°C
    C) –0.65°C
    D) –2.05°C
    E) –1.67°C

39. Suppose you add $7.88 \times 10^{-3}$ moles of $HNO_3$ to enough water to make 761.35 milliliters of solution. What is the pH of the solution?
    A) 1.99
    B) 2.78
    C) 3.57
    D) 1.39
    E) 4.37

40. The half-life of $^{137}Ce$ is 30 years. How many g of $^{137}Ce$ must be produced now to have a sample containing 49 g of $^{137}Ce$ 177 years from now?
    A) 3000 g
    B) 2000 g
    C) 6500 g
    D) 1200 g
    E) 5000 g

**Physics Questions (41 – 60)**

41. What type of force causes a car to go around level curve?
    A) A centripetal force
    B) A centrifugal force
    C) A normal force
    D) A static frictional force
    E) A kinetic frictional force

42. Bernoulli's equation is an expression of
    A) conservation of mass.
    B) conservation of energy.
    C) conservation of linear momentum.
    D) conservation of angular momentum.
    E) conservation of charge.

43. A brass ring with an inner diameter of 2.750 cm needs to be placed over an aluminum rod with a diameter of 2.775 cm. Given that the coefficients of linear thermal expansion of brass and aluminum are $19.0 \times 10^{-6}\ (C°)^{-1}$ and $25.0 \times 10^{-6}\ (C°)^{-1}$ respectively and if both of these dimensions have been measured at 15.0 °C to what final temperature does the ring need to be brought to in order to exactly fit over the rod?
    A) 360 °C
    B) 375 °C
    C) 463 °C
    D) 478 °C
    E) 493 °C

44. A pendulum is made from a string of negligible mass with length 1.75 m and a bob with a non-negligible mass, M. If the pendulum bob is released from rest at an angle of 16.3° with respect to the vertical, then what is the maximum speed of the bob? Neglect both friction and air resistance in this problem.
    A) 1.17 m/s
    B) 3.96 m/s
    C) 4.97 m/s
    D) 5.74 m/s
    E) 9.80 m/s

45. If the intensity level at a given location from one source of sound is 55.0 dB and the intensity level from another independent source of sound is 57.5 dB then what is the combined intensity level from both sources neglecting interference effects.
    A) 53.9 dB
    B) 59.4 dB
    C) 63.3 dB
    D) 113 dB
    E) This problem can't be solved with the given data.

46. How many significant digits should be correctly reported in the solution to the following calculation?

    (5.26893 - 5.26854)/1.47828

    A) 2
    B) 3
    C) 4
    D) 5
    E) 6

47. A turntable (a rotating platform that carries a phonograph record – a analogue sound storage medium usually made of polyvinyl chloride (PVC)) comes to rest after rotating through 41.66 revolutions in 2.500 minutes. What was the initial angular velocity of the turntable if the angular acceleration was uniform?
    A) 16.67 rpm
    B) 33.33 rpm
    C) 45.00 rpm
    D) 66.67 rpm
    E) 78.00 rpm

48. If you double the amplitude of the oscillation of a simple pendulum then by what factor does the frequency change?
    A) 1/4
    B) 1/2
    C) 1
    D) 2
    E) 4

49. A train on a straight level track has a final speed 65.0 km/h. A uniform acceleration with a magnitude of 1.25 m/s$^2$ was applied while the train slowed down over a distance of 255 m. What was the speed of the train at the beginning of this distance?
    A) 17.6 m/s
    B) 31.0 m/s
    C) 59.9 m/s
    D) 69.7 m/s
    E) This problem can't be solved with the given data.

50. Whose work is usually cited as experimental evidence of the particle nature of light (photon)?
    A) Bohr
    B) Compton
    C) Dirac
    D) Rutherford
    E) Schrödinger

51. A 1500 kg car accelerates uniformly from 60.0 km/hr to 90.0 km/hr in 6.00 s along a level stretch of road. If the combined resistive forces acting on the car due to both friction and air resistance have an average value of 575 N during the acceleration period, then what is the average power required of the car?
    A) 11.1 kW
    B) 31.4 kW
    C) 55.4 kW
    D) 111 kW
    E) 606 kW

52. Four equal 10.0 kg masses are placed at the corners of a square with side length 5.00 cm. Only considering the gravitational interactions between the masses themselves, what is the magnitude of the net gravitational force acting on one of the masses due to the other three? Given that $G = 6.67 \times 10^{-11}\ Nm^2/kg^2$.
A) $2.83 \times 10^{-7}$ N
B) $3.61 \times 10^{-7}$ N
C) $5.11 \times 10^{-6}$ N
D) $6.67 \times 10^{-6}$ N
E) $8.00 \times 10^{-6}$ N

53. Steel has a bulk modulus of 140 GPa. If a steel sphere 50.0 cm in diameter at STP were to have its pressure increased to 90.0 atm (roughly the surface pressure on Venus) then what is the strain? Given that 1 atm = 101.3 kPa.
A) $-6.51 \times 10^{-2}$
B) $-6.44 \times 10^{-5}$
C) $-6.36 \times 10^{-10}$
D) $+6.43 \times 10^{-10}$
E) $+6.51 \times 10^{-5}$

54. For a non-relativistic elastic collision, which of the following conservation principles apply:
I. Conservation of Kinetic Energy
II. Conservation of Linear Momentum
III. Conservation of Angular Momentum
A) I
B) I & II
C) II
D) II & III
E) I, II & III

55. In describing the photoelectric effect, the classical theory predicts that:
A) the photocurrent increases with an increase in the incident light intensity.
B) the maximum kinetic energy depends upon the frequency of the incident light.
C) there is no photocurrent if the frequency of the incident light is below a certain value.
D) the photocurrent is always observed immediately, independent of the frequency of the incident light.
E) two of the above options are true.

56. In 1921, President Warren G. Harding presented Marie Curie 1.00 gram of Radium-226 on behalf of the women of America in recognition of her service to science. If the half-life of Radium-226 is $1.60 \times 10^3$ yr then how much of the original Radium-226 in her gift is left now in 2008?
A) Effectively none.
B) 37.0 mg
C) 889 mg
D) 963 mg
E) Effectively all of it.

57. What is the wavelength in air of the radio station AM 1300 kHz – THE ZONE. Note: you may use $n_{air} = 1.000$.
A) 0.231 m
B) 2.31 m
C) 23.1 m
D) 231 m
E) $2.31 \times 10^5$ m

58. Rescue supplies are being delivered by plane to a designated drop point. The plane will approach the drop point horizontally at a constant 225 km/hr and will release the supplies at 278 m above and 485 m in front of the drop point. What is the required vertical component of the supplies velocity in order to exactly hit the drop point?
A) 2.20 m/s, up
B) 0 m/s
C) 40.7 m/s, down
D) 118 m/s, down
E) 218 m/s, down

59. At a point in space there is an electric field vector due to a first charge that has a magnitude of 4.25 N/C and points at 35.7° west of north a second electric field vector due to another charge has a magnitude of 6.81 N/C and points 10.3° south of west. What is the magnitude and direction of the net electric field at this point?
A) 9.45 N/C at 13.7° west of north
B) 9.45 N/C at 76.3° west of north
C) 10.2 N/C at 7.08° west of north
D) 10.2 N/C at 82.9° west of north
E) This problem can't be solved with the given data.

60. Two boxes, with masses 12.5 kg and 25.5 kg, are connected by a taut string on a surface that is inclined at 25° with respect to the horizontal. If the coefficients of kinetic friction between the boxes and the table are 0.100 and 0.150 respectively and the 25.5 kg box is placed below the 12.5 kg box on the incline, what is the magnitude of the acceleration of the 25.5 kg box just after they have begun to move down the incline?

A) 2.81 $m/s^2$
B) 2.96 $m/s^2$
C) 3.25 $m/s^2$
D) 4.14 $m/s^2$
E) 8.33 $m/s^2$

# UIL HIGH SCHOOL SCIENCE CONTEST
# ANSWER KEY

## INVITATIONAL A • 2008

| | | | | | |
|---|---|---|---|---|---|
| 1. | B | 21. | A | 41. | D |
| 2. | D | 22. | A | 42. | B |
| 3. | A | 23. | C | 43. | E |
| 4. | C | 24. | A | 44. | A |
| 5. | C | 25. | D | 45. | B |
| 6. | C | 26. | E | 46. | A |
| 7. | B | 27. | D | 47. | B |
| 8. | E | 28. | C | 48. | C |
| 9. | E | 29. | D | 49. | B |
| 10. | D | 30. | C | 50. | B |
| 11. | C | 31. | B | 51. | C |
| 12. | D | 32. | B | 52. | C |
| 13. | A | 33. | C | 53. | B |
| 14. | C | 34. | E | 54. | E |
| 15. | D | 35. | C | 55. | A |
| 16. | B | 36. | E | 56. | D |
| 17. | C | 37. | D | 57. | D |
| 18. | B | 38. | B | 58. | A |
| 19. | E | 39. | A | 59. | B |
| 20. | D | 40. | A | 60. | A |