

## 2018 TAME High School Practice Science Test

- (1) Adult amphibians depend on aquatic environments for  
A) food. C) locomotion.  
B) reproduction. D) gas exchange
- (2) Jackrabbits, rattlesnakes, and foxes are most suited to live in which biome?  
A) taiga C) tundra  
B) desert D) rainforest
- (3) Viruses and bacteria that causes infectious diseases are called  
A) follicles. C) luteum.  
B) pathogens. D) antibiotics.
- (4) Diffusion of water is referred to as  
A) homeostasis. C) osmosis.  
B) exocytosis. D) endocytosis.
- (5) A high-energy compound that functions in energy storage and transfer is  
A) ATP. C) Chlorophyll.  
B) LDS. D) RNA.
- (6) Which of the following is not a DNA base?  
A) uracil C) thymine  
B) guanine D) adenine
- (7) Each of two replicated strands of a chromosome is called a(n)  
A) aster. C) synapse.  
B) centriole. D) chromatid.
- (8) If the gene pairs Aa and Bb are located on the same homologous chromosomes, how many different types of gametes are possible if crossover does not occur?  
A) 4 C)  $2^4$   
B) 2 D)  $8^2$
- (9) The yellow honeysuckle plant is classified as *Lonicera flava*. The first name, *Lonicera*, is the  
A) variety C) genus  
B) species D) family
- (10) All viruses' lack  
A) energy C) genes  
B) nuclei D) DNA
- (11) The bacteria that causes syphilis is  
A) a coccus. C) a bacillus.  
B) *E. coli*. D) a spirochete.
- (12) What consists of highly coiled seminiferous tubules surrounded by *Leydig cells*, where androgen hormones are produced.  
A) the uterus C) the testes  
B) the urethra D) the vagina

- (13) Protozoa are placed in different classes according to their  
A) movement. C) shape.  
B) color. D) size.
- (14) What is the structure within the nucleus that produces rRNA and is an integral component of the ribosome?  
A) the peroxisome C) the plasma membrane  
B) the nucleolus D) the protein kinase
- (15) What is the inner compartment of a chloroplast where the Calvin cycle (light-independent reactions) of photosynthesis occurs?  
A) the thylakoid C) the stroma  
B) the peroxisome D) the turgid
- (16) What is a specific, ring-shaped second messenger in many eukaryotic cells constructed with ATP?  
A) the cyclic AMP C) the cytoplasm  
B) the cytoskeleton D) the contractile vacuole
- (17) What is the uncondensed, thread-like form of DNA present during interphase, that can be read for transcription and replication?  
A) the contractile vacuole C) the aster  
B) the centrosome D) the chromatin
- (18) Which metal is a liquid at room temperature?  
A) aluminum C) tungsten  
B) iron D) mercury
- (19) When sugar is dissolved in water, the water is called a(n)  
A) precipitate C) solvent  
B) emulsion D) residue
- (20) The electronic configuration of a neutral atom is:  $1s^2 2s^2 2p^6 3s^2 3p^4$ . What is the total number of electrons in this atom?  
A) 16 C) 11  
B) 156 D) 5
- (21) Transition metals add the last successive electrons to the  
A) s orbital C) f orbital  
B) p orbital D) d orbital
- (22) The number of molecules in 16 grams of methane,  $CH_4$ , is the same as that in how many grams of water?  
A) 2 grams C) 32 grams  
B) 6.02 grams D) 18 grams
- (23) Charles' Law states the relationship between the Kelvin temperature and \_\_\_\_\_ of a gas if the pressure is held constant.  
A) number of molecules C) volume  
B) density D) weight

- (24) If you balance the equation below, what is the least sum of the coefficients?

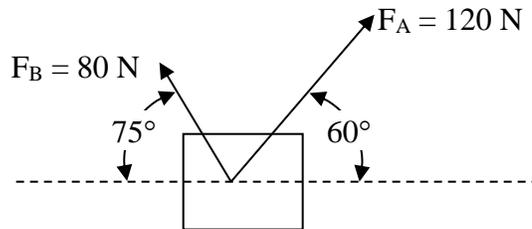


- A) 26  
B) 15
- C) 9  
D) 7
- (25) Pierre and Marie Curie discovered  
A) Radium.  
B) Chlorine.
- C) Oxygen.  
D) hydrogen.
- (26) A helium nucleus is a(n)  
A) alpha ray.  
B) crooke ray.
- C) gamma ray.  
D) beta ray.
- (27) Solids, which are not crystalline, are said to be  
A) amorphous.  
B) anti-crystalline.
- C) amphoteric.  
D) polymorphous.
- (28) Which of the following is a water-soluble, weak electrolyte?  
A) KBr  
B)  $\text{NH}_4\text{ClO}$
- C)  $\text{H}_2\text{SO}_4$   
D)  $\text{H}_2\text{CO}_3$
- (29) What is the molar concentration of NaCl solution that contains 30 grams of salt per 200 mL of solution?  
A) 0.15 M  
B) 0.30 M
- C) 1.3 M  
D) 2.6 M
- (30) An analysis of a compound used in the production of aluminum is 32.79% sodium, 13.02 % aluminum and 54.19% fluorine. The empirical formula of the compound is  
A)  $\text{Na}_3\text{AlF}_6$   
B)  $\text{Na}_5\text{AlF}_8$
- C)  $\text{NaAlF}$   
D)  $\text{Na}_3\text{AlF}_3$
- (31) How many different structural isomers of Hexane are there?  
A) 5  
B) 1
- C) 6  
D) 3
- (32) For the sublimation of dry ice:  $\text{CO}_2 (\text{s}) \longrightarrow \text{CO}_2 (\text{g})$   
A)  $\Delta H > 0$ ;  $\Delta S > 0$   
B)  $\Delta H < 0$ ;  $\Delta S > 0$
- C)  $\Delta H > 0$ ;  $\Delta S < 0$   
D)  $\Delta H = 0$ ;  $\Delta S = 0$
- (33) Calculate the quantity of charge in coulombs necessary to produce 53.9 L of  $\text{H}_2 (\text{g})$  at STP from the electrolysis of water.  
A)  $6.96 \times 10^6$   
B)  $3.71 \times 10^4$
- C)  $6.96 \times 10^4$   
D)  $4.54 \times 10^5$

- (34) When  $^{233}\text{Th}$  undergoes beta decay, which of the following is the likely product?  
 A)  $^{232}\text{Th}$  C)  $^{229}\text{Ra}$   
 B)  $^{233}\text{Pa}$  D)  $^{233}\text{Ac}$

- (35) Which of the following is an example of a scalar quantity?  
 A) force C) velocity  
 B) area D) acceleration

- (36) Two forces are acting on an object as shown below. What is the magnitude of the resultant force?



- A) 200 N C) 66.7 N  
 B) 40 N D) 185 N
- (37) If the velocity versus time graph of an object is a horizontal line, the object is  
 A) moving with constant non-zero speed.  
 B) moving with a constant non-zero acceleration.  
 C) moving with an infinite speed.  
 D) moving with an infinite acceleration.
- (38) A cartridge consists of a 5-gram bullet and a 4-gram case. The cartridge is dropped into a fire causing the gun powder to deliver 100 Joules of kinetic energy to the two components. What is the speed of the case?  
 A) 120 m/s C) 167 m/s  
 B) 83 m/s D) 225 m/s
- (39) Two uniform solid spheres have the same mass, but one has twice the radius of the other. The ratio of the larger sphere's moment of inertia to that of the smaller sphere is  
 A) 4:5 C) 8:5  
 B) 4:1 D) 2:1
- (40) What centripetal force must be exerted on a 4-kg object to allow it to go around a 12-m radius circle with a velocity of 15 m/s?  
 A) 52.4 N C) 75 N  
 B) 125 N D) 35.7 N
- (41) A substance measures 145-g in air and 88-g in water. What is the density of the substance?  
 A)  $2.75 \text{ g/cm}^3$  C)  $3.17 \text{ g/cm}^3$   
 B)  $3.55 \text{ g/cm}^3$  D)  $2.54 \text{ g/cm}^3$

- (42) A 7-m rope is stretched between two poles, which are 6-m apart. A boy is holding on to the middle of the rope and hanging down. If the boy weighs 300 N, what is the tension in the rope on the right-hand side?
- A) 183 N  
B) 291 N  
C) 425 N  
D) 291 N
- (43) Coulomb's law and Newton's law of gravitation both involve which of the following?
- A) the inverse square law.  
B) the charge on the particle.  
C) the mass of the particle.  
D) permeability
- (44) A 10-kg block is at rest on a level surface, where the coefficient of static friction is 0.6 and that for kinetic friction is 0.4. A 50-N horizontal force is applied. What is the frictional force on the block?
- A) 30 N  
B) 50 N  
C) 40 N  
D) 60 N
- (45) While in horizontal flight at a speed of 20 m/s a baseball, of mass 0.11-kg, is struck by a bat. The ball leaves the bat with a speed of 29 m/s in the direction opposite to its original direction. What is the magnitude of the impulse given to the ball?
- A) 0.99 kg-m/s  
B) 3.2 kg-m/s  
C) 0.55 kg-m/s  
D) 2.2 kg-m/s
- (46) Two resistors  $R_1$  and  $R_2$  are connected in parallel, and this combination is connected in series with a third resistor  $R_3$ . If  $R_1 = 5 \Omega$ ,  $R_2 = 2 \Omega$  and  $R_3 = 6 \Omega$ , what is the equivalent resistance of this combination?
- A) 3.2  $\Omega$   
B) 0.31  $\Omega$   
C) 13  $\Omega$   
D) 7.4  $\Omega$
- (47) A disk-shaped grindstone of mass 3.0 kg and radius 8.0 cm is spinning at 600 rev/min. After the power is shut off, Dan continues to sharpen his axe by holding it against the grindstone until it stops 10 seconds later. What is the average torque exerted on the grindstone?
- A) 9.6 N – m  
B) 0.75 N – m  
C) 0.06 N – m  
D) 1.2 N – m
- (48) A positive point charge of  $10^{-4}$  C is located 3 m from another point charge of  $10^{-5}$  C. Their mutual electric potential energy is
- A) 0 Joule  
B) 3 Joules  
C) 1 Joule  
D) 10 Joules
- (49) Genny is sitting on the seat of a swing with ropes 10 m long. Her boyfriend pulls the swing back until the ropes make a  $37^\circ$  angle with the vertical and then releases the swing. If air resistance is neglected, what is the speed of Genny at the bottom of the arc when the ropes are vertical?
- A) 8.8 m/s  
B) 4.9 m/s  
C) 11 m/s  
D) 6.3 m/s



- (58) A print left in paint or on a waxy surface would be called a
- A) latent print.
  - B) visible print.
  - C) plastic print.
  - D) hidden fingerprint.
- (59) Which natural fiber is the most common?
- A) cotton
  - B) polyester
  - C) nylon
  - D) wool
- (60) A forensic anthropologist would most likely use which bone to determine height of a corpse?
- A) phalanges
  - B) femur
  - C) occipital
  - D) patella

## 2017 TAME High School Practice Science Test Answer Key

(1) B  
(2) B  
(3) B  
(4) C  
(5) A  
(6) A  
(7) D  
(8) C  
(9) C  
(10) B  
(11) D  
(12) C  
(13) A  
(14) B  
(15) C  
(16) A  
(17) D  
(18) D  
(19) C  
(20) A

(21) D  
(22) D  
(23) C  
(24) C  
(25) A  
(26) A  
(27) A  
(28) D  
(29) D  
(30) A  
(31) A  
(32) A  
(33) D  
(34) B  
(35) B  
(36) D  
(37) A  
(38) C  
(39) B  
(40) C

(41) D  
(42) B  
(43) A  
(44) B  
(45) B  
(46) D  
(47) C  
(48) B  
(49) D  
(50) C  
(51) A  
(52) B  
(53) B  
(54) C  
(55) D  
(56) A  
(57) A  
(58) C  
(59) A  
(60) B