

SINDH MDCAT PAPER 2012

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NTS past paper 2012

ENGLISH

Identify the word or phrase that needs to be changed for the sentence to be correct:

1. He brought down the tiger with his first shot. No error
A B C D E

2. The noise of the traffic make it impossible for us to work with the A
windows open. No error B C D
E

Complete the sentences by choosing the most appropriate word, from the given lettered choices (A to E) below each.

3. He got off his bicycle and _____ it through the gate.

- A. walked
- B. jumped
- C. wheeled
- d. repaired

4. Somebody has not turned the tap _____.

- A. of
- B. off
- C. over
- D. in
- E. at



Read the passage to answer questions 5-6

To inquire after the meaning or object of one's own existence or of creation generally, has always seemed to me absurd from an objective point of view. And yet everybody has certain ideals which determine the direction of his endeavors and his judgments. In this sense, I have never looked upon ease and happiness as ends in themselves-such an ethical basis I call more proper for a herd of swine. The ideals which have lighted me on my way and time after time given me new courage to face life cheerfully, have been Truth, Goodness, and Beauty. Without the sense of fellowship with men of like mind, of preoccupation with the objective, the eternally unattainable in the field of art and scientific research, life would have seemed to me empty. The ordinary objects of human endeavor property, outward success, luxury-have always seemed to me contemptible.

5. The author of the passage followed which of the following objectives?

- I. Truth
 - II. Goodness
 - III. Beauty
 - IV. Saints
- A. I Only
 - B. II Only
 - C. I & II Only
 - D. I, II & III Only
 - E. I, II, III, IV

6. Which of the following is contemptible for the author ?

- A. truth, goodness, and beauty
- B. property, outward success, luxury
- C. art and scientific research
- D. sense of fellowship with men of like mind
- E. preoccupation with the objective

Choose the word most similar in meaning to the capitalized one.

7. FREIGHT:

- A. worries
- B. luggage
- C. instruments
- D. foolish
- E. uneasy



8. HARDSHIP:

- A. wealth
- B. blessings
- C. gift
- D. suffering
- E. objections

Choose the lettered word or phrase that is most nearly opposite in meaning to the word in capital letters.

9. NEGLIGIBLE:

- A. significant
- B. untamed
- C. tiny
- D. casual
- E. minute

10. ELEGANT:

- A. graceful
- B. unattractive
- C. neat
- D. appeasing
- E. enchanting

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PHYSICS

11. Identify the example/s of Static Equilibrium:

- I. A book lying on a horizontal table
- II. A building
- III. A bridge

- A. I only
- B. II only
- C. III only
- D. II and III only
- E. I, II and III

12. The mass of earth on the basis of Newton's Law of Gravitation is given by:

- A. $M = 9.1 \times 10^{-31} \text{ kg}$
- B. $M = 1.6027 \times 10^{-27} \text{ kg}$
- C. $M = 5.98 \times 10^{24} \text{ kg}$
- D. $M = 6.02 \times 10^{23} \text{ kg}$
- E. $M = 3 \times 10^3 \text{ kg}$

13. Fusion and fission reactions are associated with:

- A. Water or hydal energy
- B. Geothermal energy
- C. Fossil fuel energy
- D. Nuclear energy
- E. Tidal energy

14. What is the change in gravitational potential energy when 7000 N elevator moves from street level to the top of building 300 m above the street level?

- A. 2100 J
- B. 21000 J
- C. 210000 J
- D. $2.1 \times 10^6 \text{ J}$
- E. 210 J



15. A body of mass 0.025 kg attached to a spring is displaced through 0.1 m to the right of equilibrium position. If the spring constant is 0.4 N/m and its velocity at the end of displacement is 0.4 m/sec then its total energy will be:

- A. 4×10^{-3} J
- B. 0.0002 J
- C. 0.000001 J
- D. 0.2 J
- E. 0.04 J

16. The unit of luminous intensity is _____.

- A. Mole
- B. Ampere
- C. Kelvin
- D. Candela

17. If $\vec{A} = 2\mathbf{i} + 3\mathbf{j} - \mathbf{k}$, $\vec{B} = 4\mathbf{i} + 2\mathbf{j} - 2\mathbf{k}$. Find a vector \vec{X} parallel to \vec{A} but has magnitude of \vec{B} ?
parallel to

- A. $\sqrt{12/7} (2\mathbf{i} + 3\mathbf{j} - \mathbf{k})$
- B. $\sqrt{7/12} (4\mathbf{i} + 2\mathbf{j} - 2\mathbf{k})$
- C. $\sqrt{7/12} (2\mathbf{i} + 3\mathbf{j} + \mathbf{k})$
- D. $\sqrt{3/5} (\mathbf{i} + 2\mathbf{j} - 3\mathbf{k})$
- E. $\sqrt{5/12} (3\mathbf{i} + 5\mathbf{j} - 2\mathbf{k})$

18. If $\vec{A} = 3\mathbf{i} + 6\mathbf{j} - 2\mathbf{k}$ then the unit vector parallel \vec{A} will be :

- A. $3\mathbf{i} + 6\mathbf{j} + 2\mathbf{k} / 7$
- B. $3/7 \mathbf{i} + 6/7 \mathbf{j} - 2/7 \mathbf{k}$
- C. $3/7 \mathbf{i} + 6/7 \mathbf{j} + 2/7 \mathbf{k}$
- D. $7/3 \mathbf{i} + 6\mathbf{j} - 2\mathbf{k}$
- E. $7/3 \mathbf{i} + 6\mathbf{j} + 2\mathbf{k}$

19. if $\vec{V} = \lim_{\Delta t \rightarrow 0} \Delta \vec{r} / \Delta t$, then \vec{V} will be :

- A. Average velocity
- B. Uniform velocity
- C. Instantaneous velocity
- D. Variable velocity
- E. None of the above



20. A ball is thrown vertically upward with the velocity of 98 m/sec, how high does the ball rise?

- A. 196 m
- B. 2 m
- C. 1/2 m
- D. 490 m
- E. 98 m

21. A particle is projected at an angle of 45° with a velocity of 9.8m/s. The horizontal range will be: ($g=9.8 \text{ m/s}^2$).

- A. $9.8 \sqrt{2} \text{ m}$
- B. $9.8 \sqrt{2} \text{ m}$
- C. 9.8 m
- D. 4.9 m
- E. 3.1 m

22. 1 radian = _____ degrees .

- A. 360°
- B. 180°
- C. 100°
- D. 57.3°
- E. 0.01745°

23. If $\mathbf{I} = \mathbf{r} \times \mathbf{p}$ and \mathbf{r} = position vector \mathbf{P} = linear momentum then \mathbf{I} in the equation will be :

- A. current
- B. length
- C. angular momentum
- D. torque
- E. displacement

24. The superposition of two light waves is called:

- A. Diffraction
- B. Polarization
- C. Interferonco
- D. Reflection
- E. Absorption



25. A convex lens of focal length 20 cm, is used to form an erect image which is twice as large as the object, the position of the object will be _____ from the lens.

- A. 20 cm
- B. 5 cm
- C. 10 cm
- D. 30 cm
- E. 40 cm

26. A system absorbs 1000 Joules of heat and delivers 600 Joules of work, while losing 100 Joules of heat by conduction to the atmosphere, the change in the internal energy of the system will be:

- A. 600 Joules
- B. 900 Joules
- C. 300 Joules
- D. 400 Joules
- E. 1600 Joules

27. _____ is a device which makes use of mutual induction for stepping up or down an alternating o.m.f.

- A. Sonometer
- B. Transformer
- C. Ammeter
- D. Voltmeter
- E. Potentiometer

28. In a circuit, there is a current of 5 amp which is changed such that the current falls to zero in 0.1 sec. If an average e.m.f. of 200 volts is induced, the self inductance of the circuit will be:

- A. 4 henrys
- B. 5 henrys
- C. 6 henrys
- D. 7 henrys
- E. 8 henrys

29. The instrument(s) which work on the principle of Wheatstone bridge is/are :

- A. Meter Bridge
- B. The Post Office Box
- C. Carey Foster's Bridge
- D. Callendar
- E. All of the above



30. An ammeter reads up to 1 A. Its internal resistance is 0.81Ω . To increase the range to 10 A, the value of the required shunt is:

- A. 0.3Ω
- B. 0.9Ω
- C. 0.09Ω
- D. 0.03Ω
- E. 1.3Ω

31. Electromagnetic waves are produced by:

- A. motion of electric and magnetic fields
- B. chargeless particles
- C. a static charge
- D. heat
- E. none of the above

32. The energy of an X-ray quantum of wavelength $1.0 \times 10^{-10} \text{ m}$ is.

- A. $1.99 \times 10^{-15} \text{ J}$
- B. $3 \times 10^8 \text{ J}$
- C. $6.6 \times 10^{-34} \text{ J}$
- D. $19.89 \times 10^{-26} \text{ J}$
- E. 1.99 Joules

33. The shortest wavelength photon emitted in Balmer series is:

- A. $1.0974 \times 10^{-7} \text{ m}$
- B. 4 nm
- C. 364.6 nm
- D. 3.64 m
- E. 480 nm

34. To remove the huge amount of heat energy in nuclear reactor, _____ are used.

- A. Core
- B. Control rods
- C. Shielding
- D. Moderators
- E. Coolants



35. The half life of C^{14} is about:

- A. 1637 years
- B. 892 years
- C. 10 years
- D. 100 years
- E. 5730 years

36. The equation $\Delta U = \Delta Q$ refers to:

- A. Isothermal process
- B. Adiabatic process
- C. Isochoric process
- D. Isobaric process
- E. Carnot cycle

37. Two capacitors $C_1 = 3\mu\text{f}$ and $C_2 = 6\mu\text{f}$ are in series across a 90 volts D.C supply. The total capacitance is given by:

- A. $9\mu\text{f}$
- B. $2\mu\text{f}$
- C. $10\mu\text{f}$
- D. $90\mu\text{f}$
- E. $5\mu\text{f}$

38. Kinetic energy of a charged particle decreases by 10 J as it moves from a point at potential 100 V to 200 V. The charge on the particle is:

- A. 10^{-3} C
- B. 10^{-2} C
- C. 10^{-1} C
- D. 10^5 C
- E. 10^{-9} C

39. A 100 watt bulb is operated by 240 volts, the current through the bulb will be:

- A. 2.4 A
- B. 240 A
- C. 0.416 A
- D. 41.6 A
- E. 416 A

40. A bulb having a resistance of 150Ω is connected to a 225 volt source, the current in the bulb will be:

- A. 1.5 A
- B. 10 A
- C. 3.7350 A
- D. 250 A
- E. 100 A



CHEMISTRY

41. If the reaction :



is described as being of zero order with respect to P, it means that.

- A. P is a catalyst in this reaction
- B. No P molecules possess sufficient energy to react
- C. The concentration of P does not change during the reaction
- D. The rate of reaction is independent of the concentration of P
- E. The rate of reaction is proportional to the concentration of Q

42. The number of moles of solute dissolved per liter of solution is called:

- A. Normality
- B. Molality
- C. Molarity
- D. Percentage composition
- E. Mole fraction

43. The oxidation number of all the elements in free state is _____.

- A. 1
- B. 3
- C. 0
- D. -1
- E. -3

44. Sum of all the exponents of molar concentration of the reactant present in the rate equation is known as _____.

- A. molecularity
- B. order of reaction
- C. rate of reaction
- D. Gradient
- E. slope



45. According to _____ "the properties of elements are the periodic function of their atomic number".

- A. Mendeleev's periodic law
- B. Newland's law of octaves
- C. Dobernien's triads
- D. Lothar Meyer's classification
- E. Modern periodic law

46. 2 grams of H₂ molecule contain _____ molecules .

- A. 12.04×10^{23}
- B. 6.02×10^{23}
- C. 3.01×10^{23}
- D. 1.008
- E. 2

47. Comparative rates of diffusion of He and SO₂, will be _____.

- A. 8
- B. 2
- C. 4
- D. 16
- E. 64

48. The unit of viscosity is _____.

- A. Joule
- B. N/m²
- C. dynes/cm
- D. poises
- E. ergs

49. The maximum possible number of electrons a shell 'n' can accommodate is given by .

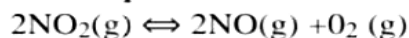
- A. n
- B. n²
- C. 2n²
- D. N³
- E. 3n²



50. $\text{Cl} + e \rightarrow \text{Cl}^-$ $\Delta H = -348\text{kJ/mol}$ the value -348kJ/mol in this case will be:

- A. Ionization energy
- B. Electronegativity
- C. Electron affinity
- D. Entropy
- E. Free energy

51. Nitrogen dioxide decomposes on heating according to the following equation



When 4 mole of nitrogen dioxide were put into a 1 dm^3 container and heated to a constant temperature, the equilibrium mixture contained 0.8 mole of oxygen.

What is the numerical value of the equilibrium constant, K_c , at the temperature of the experiment?

- A. $0.8^2 \times 0.8 / 4^2$
- B. $1.6 \times 0.8 / 2.4^2$
- C. $1.6^2 \times 0.8 / 4^2$
- D. $1.6^2 \times 0.8 / 2.4^2$

52. H_2S is an example of _____ hydride .

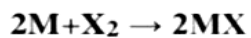
- A. ionic
- B. covalent
- C. complex
- D. metallic.
- E. border-line hydride

53. The formula of "rock salt" is:

- A. NaOH
- B. NaHCO_3
- C. Na_2CO_3
- D. CuSO_4
- E. NaCl .



54. For the reaction (where X' Is halogen)



It M is metal, it is more likely to be:

- A. Alkaline earth metal
- B. Alkali metal
- C. Outer transition metal
- D. Inner transition metal
- E. None of the above

55. Which one is not true for H₂SO₄?

- A. Acid
- B. Oxidizing agent
- C. Nitrating agent
- D. Dehydrating agent
- E. Sulphonating agent

56. Transition elements and their compounds are commonly used as catalysts due to

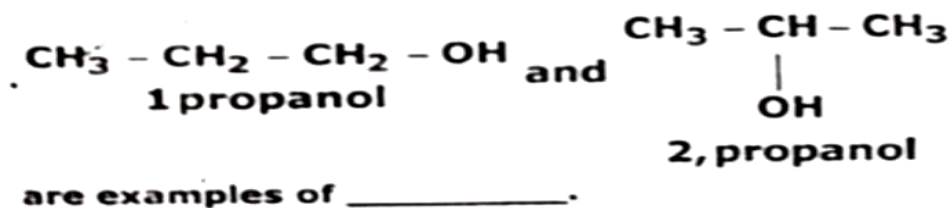
- A. involvement of inner-d-orbitals
- B. due to the presence of unpaired electron
- C. d-d transition of electrons
- D. variable oxidation state
- E. suitable surface area

57. The C-C bond distance is

- A. 1.10 Å
- B. 1.20 Å
- C. 1.30 Å
- D. 1.54 Å
- E. 1.34 Å



58.

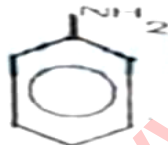


- A. Chain isomerism
- B. Position isomerism
- C. Functional group isomerism
- D. Metamerism
- E. Optical isomerism

59. $\text{CH} \equiv \text{CH} + 2 \text{AgNO}_3 \rightarrow \text{AgC} \equiv \text{CAg} + 2\text{HNO}_3$
represents _____ property of acetylene.

- A. basic
- B. acidic
- C. dehydrating
- D. physical
- F. none of the above

60.



(-NH₂) on benzene ring is:

- A. meta-directing and deactivating group
- B. Ortho-para directing and deactivating group.
- C. ortho-para directing and activating group
- D. orthro-directing and activating only
- E. para-directing and deactivating only

61. **The stability of carbonium ions follow the order:**

- A. $\text{CH}_3^+ > \text{RCH}_2^+ > \text{R}_2\text{C}^+\text{H} > \text{R}_3\text{C}^+$
- B. $\text{R}_3\text{C}^+ > \text{R}_2\text{CH}^+ > \text{RC}^+\text{H}_2 > \text{C}^+\text{H}_3$
- C. $\text{R}_3\text{C}^+ > \text{CH}_3^+ > \text{R}_2^+\text{CH} > \text{R}^+\text{CH}_2$
- D. $\text{R}_2\text{CH}^+ > \text{CH}_3^+ > \text{RCH}_2^+ > \text{R}_3\text{C}^+$
- E. $\text{R}_3\text{C}^+ > \text{R}_2\text{CH}^+ > \text{CH}_3^+ > \text{RCH}_2^+$

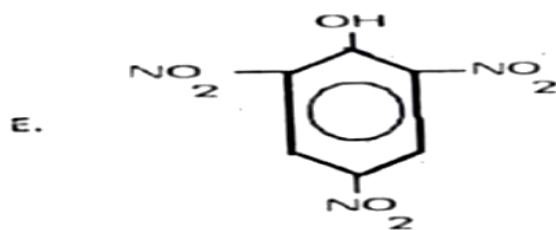
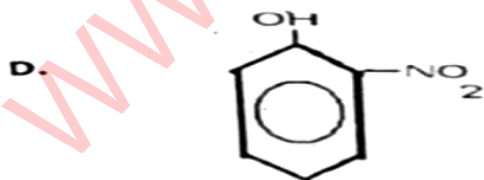
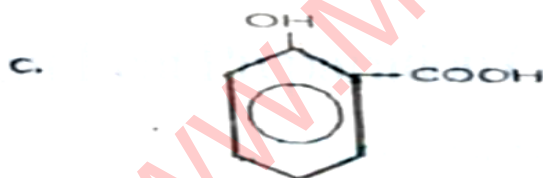
62. RMOX is an organometallic compound, generally known as:

- A. Grignard's Reagent
- B. Baeyer's reagent
- C. Ether
- D. Ester
- E. Aldehyde

63. _____ is used as preservative for life specimen.

- A. H_2SO_4
- B. Ammonia
- C. Methanol
- D. NaOH
- E. Formalin

64. The structural formula of picric acid is:



65. _____ is needed in thyroxine, the hormone of thyroid gland.

- A. Mg^{++}
- B. K^{+1}
- C. Ca^{++}
- D. Iodine
- E. Zinc

66. Sp^3 hybridization in CH_4 gives it _____ geometry.

- A. Linear
- B. Co planer
- C. Tetra hedral
- D. Trigonal pyramid
- E. Octahedral

67. 1 calories = _____ Joules.

- A. 200 Joules
- B. 2000 Joules
- C. 4.184 Joules
- D. 4180 Joules
- E. 3630 Joules

68. The amount of heat provided to a system at constant pressure (q_p) is equal to _____.

- A. Change in internal energy (ΔE)
- B. Change in enthalpy (ΔH)
- C. Change in free energy (ΔG)
- D. Change in temperature only (ΔT)
- E. Change in pressure only (ΔP)

69. $AgCl \rightleftharpoons Ag^+ + Cl^-$

The K_{sp} for the reaction will be:

- A. $K_{sp} = [AgCl] / [Ag^+][Cl^-]$
- B. $K_{sp} = [Ag^+][Cl^-] / [AgCl]$
- C. $K_{sp} = [Ag^+][Cl^-]$
- D. $K_{sp} = [agcl]$
- E. $K_{sp} = [Ag^+] / [Cl^-]$



70. EDTA ion is a _____ legend.

- A. Monodentate
- B. Bidentate
- C. Tridentate
- D. Polydentate
- E. None of the above

BIOLOGY

71. The secondary and tertiary consumers are also known as:

- A. green plants
- B. herbivores
- C. abiotic factors
- D. decomposers
- E. carnivores

72. Plants absorb it in the form of soluble phosphates. It is present abundantly in growing and storage organs of plants. What is it?

- A. H₂O
- B. CO₂
- C. K
- D. P
- E. N

73. Pharynx leads air into _____ through glottis .

- A. Trachea
- B. bronchus
- C. alveoli
- D. nasal sac
- E. larynx



74. The concentration of Na ions in the body fluids is controlled by _____ hormone.

- A. ADH
- B. parathormone
- C. aldosterone
- D. estrogen
- E. thyroxin

75. The movement of plants in response to touch stimulus is called:

- A. hydrotropism
- B. chemotropism
- C. geotropism
- D. thigmotropism
- E. phototropism

76. The number of muscles in a human body is about:

- A. 200
- B. 300
- C. 400
- D. 500
- E. 600

77. Steroids consist of 6-membered carbon rings and one 5 membered carbon ring.

- A. Four
- B. Three
- C. Two
- D. Five
- E. Six

78. An enzyme increases the speed of a reaction:

- A. by adding activation energy requirements
- B. by lowering activation energy requirements
- C. by decreasing the concentration of products
- D. by increasing the concentration of products
- E. all of the above

79. Lysosomes are also called:

- A. Suicide sacs
- B. Chondriosome
- C. Storage organelle
- D. Dictyosome
- E. Power house of a cell



80. Closely related species are grouped together into _____.

- A. families
- B. orders
- C. phyla
- D. kingdom
- E. genera

81. The cell wall of most of the bacteria have unique macromolecule called _____.

- A. cellulose
- B. chitin
- C. fibres
- D. fats
- E. peptidoglycan

82. All of the following organisms belong to the kingdom protista EXCEPT:

- A. Ulva
- B. Euglena
- C. Suctoria
- D. Slime mold
- E. Common Molds

83. Parasitic fungi absorbs nutrients directly from the living host with the help of special hyphal tips called _____.

- A. Roots
- B. Root hair
- C. Rhizoids
- D. Haustoria
- E. None of the above

84. The botanical name of Imli is:

- A. Cassia fistula
- B. Mimosa pudica
- C. Tamarindus indica
- D. Datura alba
- E. Rosa indica



85. Which one is not the group of Gymnosperm ?

- A. Cycads
- B. Ginkgo
- C. Gnetae
- D. Conifers
- E. Musci

86. Which one of the following is fish?

- A. Star fish
- B. Jelly fish
- C. Cuttle fish
- D. Sea horse
- E. None of the above

87. Glucose \rightarrow 2pyruvic acid + 2H₂O

2NAD + 2Pi \rightarrow 2ATP

2NAD + 4H \rightarrow 2NADH + 2H⁺

These three reactions collectively constitute _____.

- A. Kreb's cycle
- B. Calvin's cycle
- C. Electron transport chain
- D. Light reaction
- E. Glycolysis

88. The genotype of normal male in humans is _____ chromosomes,

- A. 44+XX
- B. 44+XY
- C. 44+XXY
- D. 44+X0
- E. 44+XXX

89. The process of replacing or supplementing the defective allele with a functional, normal allele is known as _____.

- A. allele transplant
- B. physiotherapy
- C. Gene therapy
- D. mutation
- E. cloning



90. Germ cells give rise to:

- A. legs
- B. head
- C. eggs and sperms
- D. hands
- E. all body parts

91. Cells from a bacterial clone were grown for many generations on a medium in which all the nitrogen compounds contained only the isotope nitrogen 15 (^{15}N). Adenine comprised 36% of the nitrogen bases present. A sample of these bacteria was transferred to a medium in which the only nitrogen source was ^{14}N and was provided with conditions suitable for asexual reproduction. What was the percentage of guanine in the DNA?

- A. 14%
- B. 18%
- C. 28%
- D. 36%
- E. 64%

92. Nitrogen-cycle is facilitated by _____.

- A. Algae
- B. Fungi
- C. Bacteria
- D. Virus
- E. Earth-quacks

93. Savannah is an example of _____ ecosystem.

- A. marine water
- B. fresh water
- C. forest
- D. tropical grass land
- E. desert



94. In cats, the genes controlling coat-colour are co-dominant (incompletely dominant) and are carried on the X chromosomes. When a black female was mated with a ginger male the resulting litter consisted of black male and tortoise-shell female kittens. What phenotypic ratio would be expected in the F₂ generation

- A. 1 black male: 1 ginger male: 2 tortoise-shell females
- B. 1 black male: 1 ginger male: 1 tortoise-shell female 1 black female
- C. 2 black males: 1 tortoise-shell female: 1 ginger female black female
- D. 1 black male : 1 tortoise-shell female : 1 ginger female : 1 black female
- E. 2 black males : 1 tortoise-shell female : 1 black female

95. The region where the impulse moves from one neuron to another _____ is called

- A. Axon
- B. Dendrites
- C. Synapse.
- D. Thalamus
- E. Cerebellum

96. A bean seed contains all of the following except :

- A. A seed coat
- B. An epicotyl
- C. A hypocotyl
- D. A hypha
- E. Cotyledon

97. _____ is the reconstruction of the lost part of the body,

- A. Growth
- B. Development
- C. Regeneration
- D. Blastulation
- E. Gastrulation

98. Fern has _____ pair of chromosome.

- A. 20
- B. 40
- C. 500
- D. 13
- E. 7



99. Which valve action results from an increase in pressure in the ventricles of the heart?

- A. The closing of all the heart valves
- B. The closing of semi-lunar valves
- C. The opening of the bicuspid valve
- D. The opening of the semi-lunar valves
- E. The opening of the tricuspid valve

100. The combination of XXY (47) chromosomes results in:

- A. Down's Syndrome
- B. Turner's Syndrome
- C. Klinefelter's Syndrome
- D. Sickle cell anemia
- E. Color blindness



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NTS ANSWERE KEY 2012

Question	Correct Choice	Question#	Correct Choice	Question#	Correct Choice	Question#	Correct Choice
1	E	26	C	51	D	76	E
2	B	27	B	52	B	77	B
3	C	28	A	53	E	78	B
4	B	29	E	54	B	79	A
5	D	30	C	55	C	80	E
6	B	31	A	56	E	81	E
7	B	32	A	57	D	82	E
8	D	33	C	58	B	83	D
9	A	34	E	59	B	84	C
10	B	35	E	60	C	85	E
11	E	36	C	61	B	86	D
12	C	37	B	62	A	87	E
13	D	38	C	63	E	88	B
14	D	39	C	64	E	89	C
15	A	40	A	65	D	90	C
16	E	41	D	66	C	91	A
17	A	42	C	67	C	92	C
18	B	43	C	68	B	93	D
19	C	44	B	69	C	94	B
20	D	45	E	70	D	95	C
21	C	46	B	71	E	96	D
22	D	47	C	72	D	97	C
23	C	48	D	73	E	98	C
24	C	49	C	74	C	99	D
25	C	50	C	75	D	100	C

