

SINDH MDCAT Paper 2015

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NTS past paper 2015

ENGLISH

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

1. If the children do their homework quickly, they will have time to
- A B c d

Watch television . No Error .

E

2. The bus stopped too take up three or four people who were waiting by
- A B C
- the post office . No error
- D E

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

3. RELIEVED:

A. worried
B. anxious
C. relaxed
D. alarmed

4. BRUTAL:

A. kind
B. cruel
C. polished
D. smooth
E. tender



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

5. CONVICT:

- A. prisoner
- B. crook
- C. acquit
- D. hire
- E. Stretch

6. AMUSED :

- A. Smiling
- B. Pleased
- C. Annoyed
- D. Delighted

Read the passage to answer questions 7-8

In earlier times, when every substance was believed to have its own qualities, there was no difficulty in believing that some substances were endowed with life, others not. Wood was wood, and water was water, and though transformations did occur, as in the disappearance of wood in the fire, they were not surprising in a world where the most miraculous changes were taking place under everyone's every day. There was nothing but 'doth suffer a sea-change into something rich and strange'. A seed put into the ground became in a short time a plant with leaves and flowers: the white and yolk of an egg turned into the flesh and bones and feathers of a chicken, which, no sooner was the shell cracked, jumped out and started running about.

7. Some substances are alive and some are not:

Which of the following statement best describes this belief?

- A. The transformation in natural substances was unnoticed in ancient times
- B. There was no transformation in natural substances in ancient times
- C. There was no concept of dead and alive things in the past
- D. The burning of wood is not an example of transformation
- E. None of the above



8. **There was nothing but "Doth suffer a sea-change into something rich and strange" means:**

- A. The transformation of seed into a tree
- B. In everyday life natural things change drastically
- C. The suffering of change are always enormous
- D. Nature does not support any change
- E. Both A and B

Complete the sentences by choosing the most appropriate lettered choices (A to D) below .

9. **The milkman _____ many bottles of milk to our school everyday.**

- A. delivers
- B. has deliver
- C. have deliver
- D. delivering

10. **I was having a cup _____ tea when he knocked on the door.**

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



PHYSICS

11. Two spherical balls of 2.0 kg and 3.0 kg masses are moving towards each other with velocities of 6 m/s and 4 m/s respectively. What must be the velocity of the smaller ball after collision, if the velocity of the bigger ball is 3 m/s?

- A. 1.5 m/s
- B. 2.5 m/s
- C. 3.5 m/s
- D. 4.5 m/s
- E. 5.5 m/s

12. An apple is thrown with a speed of 30 m/s in a direction 30° above the horizon. Find out its horizontal range. ($g = 9.8 \text{ m/s}^2$).

- A. 20 m
- B. 40 m
- C. 60 m
- D. 80 m
- E. 100 m

13. A 1000 kg vehicle is turning round a corner at 10 m/s as it travels along an arc of a circle. If the radius of the circular path is 10 m, how large a force must be exerted by the pavement on the tyres to hold the vehicle in the circular path?

- A. $1.0 \times 10^4 \text{ N}$
- B. $3.0 \times 10^4 \text{ N}$
- C. $5.0 \times 10^4 \text{ N}$
- D. $7.0 \times 10^4 \text{ N}$
- E. $9.0 \times 10^4 \text{ N}$

14. Consider the following examples of motion:

- I. The daily motion of the earth about its own axis
- II. The motion of planets round the sun
- III. Sugar cane crushing machine is run by a camel that moves in circular path around the machine.
- IV. Rotation of fly wheel about its axle.

Which of the following is correct?

- A. I and II are examples of spin motion.
- B. I and II are examples of orbital motion.
- C. II and IV are examples of spin motion.
- D. III and IV are examples of orbital motion.
- E. I and IV are examples of spin motion and II and III are examples of orbital motion.



15. What will be gravitational force of attraction between two balls each weighing 5 kg, when placed at a distance of 0.33 m apart. ($G = 6.673 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$)

- A. $9.1 \times 10^{-8} \text{ N}$
- B. $7.1 \times 10^{-8} \text{ N}$
- C. $6.1 \times 10^{-8} \text{ N}$
- D. $3.5 \times 10^{-8} \text{ N}$
- E. $1.5 \times 10^{-8} \text{ N}$

16. A 70 kg sportsman runs up a long flight of stairs in 4 seconds. The vertical height of the stairs is 4.5 m. What will be his power output in watts?

- A. $7.7 \times 10^2 \text{ W}$
- B. $8.8 \times 10^3 \text{ w}$
- C. $9.5 \times 10^3 \text{ w}$
- D. $10.2 \times 10^4 \text{ w}$
- E. $13.5 \times 10^7 \text{ w}$

17. Calculate the final kinetic energy when a shop keeper pushes a fruit crate, initially at rest towards another shopkeeper by exerting a constant horizontal force F of magnitude 5N through a distance of 1 meter.

- A. 2J
- B. 3 J
- C. 5 J
- D. 7 J
- E. 9J

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18. When the component of the force is in the same direction of the displacement ($\theta = 0$), the work is _____ when the direction of the force is opposite to the direction of displacement ($\theta = 180$), the work is _____ and when the force acts at right angles to the displacement ($\theta = 90$), the work is _____.

- A. negative ... zero ... positive
- B. positive ... negative ... zero
- C. negative ... positive ... zero
- D. zero ... positive ... negative
- E. positive ... zero ... negative



19. A train is approaching a station at 90 km/h sounding a whistle of frequency 1000 Hz what will be the apparent frequency heard by The listener sitting on the platform if the train moves away from the station with the same speed? (speed of sound = 340 m/s).

- A. 931.5 Hz
- B. 105.7 Hz
- C. 135.9 Hz
- D. 153.1 Hz
- E. 164.9 Hz

20 . A Simple pendulum completes one oscillation in 4 seconds. Calculate its length when $g = 9.8 \text{ m/S}^2$, as the time period of simple pendulum is given by $T = 2\pi \sqrt{l/g}$.

- A. 3.973 m
- B. 5.123 m
- C. 7.111 m
- D. 9.231 m
- E. 12.141 m

21. $m\lambda = 2d \sin\theta$, this relation is called as _____.

- A. Coulomb's Law
- B. Bragg's Law
- C. Faraday's Law
- D. Ohm's Law
- E. Gravitationa! Law

22. A microscope has an objective of 10 mm focal length and eye piece of 25 mm focal length. What is the distance between the lenses, if the object is in sharp focus when it is 10.5 mm from the objective?

- A. 232.7 mm
- B. 431.1 mm
- C. 511.9 mm
- D. 711.8 mm
- E. E. 913.7 mm



23. A gas is enclosed in a container fitted with a piston of cross sectional area 0.10m^2 . The pressure of the gas is maintained at 8000 N/m^2 . When heat is slowly transferred, the piston is pushed up through a distance of 4.0 cm . If 42 J heat is transferred to the system during the expansion, what is the change in internal energy of the system?

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

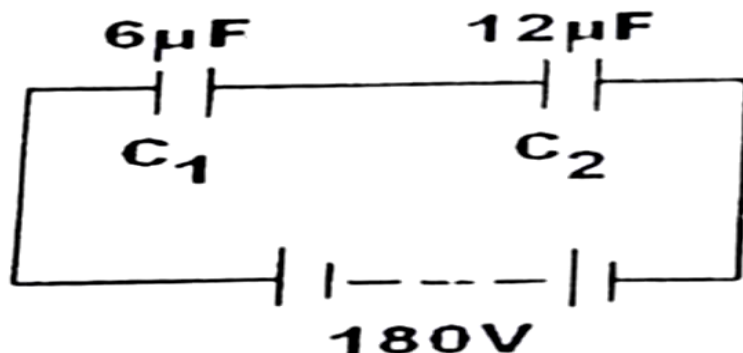
24. A particle carrying charge of $2e$ falls through a potential difference of 3.0V . Calculate the energy acquired by it.

- A. $9.6 \times 10^{-19}\text{ J}$
- B. $12.1 \times 10^{-19}\text{ J}$
- C. $14.5 \times 10^{-19}\text{ J}$
- D. $16.7 \times 10^{-19}\text{ J}$
- E. $18.5 \times 10^{-19}\text{ J}$

25. The total outward flux over any closed hypothetical surface is called _____ is equal to the total charge enclosed divided by ϵ_0 irrespective of the way in which the charge is distributed.

- A. Coulomb surface
- B. Gaussian surface
- C. Ohm surface
- D. Faraday surface
- E. Newton surface

26. Two capacitors C_1 ($6\mu\text{F}$) and C_2 ($12\mu\text{F}$) are in series across a $180\text{ volts d.c. supply}$. Calculate the potential difference across each capacitor (C_1 and C_2).



- A. 98 volts ... 32 volts
- B. 120 volts ... 60 volts
- C. 68 volts ... 96 volts
- D. 30 volts ... 65 volts
- E. 25 volts ... 25 volts

27. **0.75 A current flows through an iron wire when a battery of 1.5 volt is connected across its ends. The length of the wire is 5.0 m and its cross sectional area is $2.5 \times 10^{-7} \text{ m}^2$. What is the resistivity of Iron?**

- A. $9.0 \times 10^{-7} \Omega \text{ m}$
- B. $7.0 \times 10^{-7} \Omega \text{ m}$
- C. $5.0 \times 10^{-7} \Omega \text{ m}$
- D. $3.0 \times 10^{-7} \Omega \text{ m}$
- E. $1.0 \times 10^{-7} \Omega \text{ m}$

28. **The potential difference between the terminals of a battery in an open circuit is 2.2 V. When it is connected across a resistance of 5.0Ω , the potential falls to 1.8V. What is the internal resistance of the battery? (Approx)**

- A. 9.11Ω
- B. 2.11Ω
- C. 3.11Ω
- D. 1.11Ω
- E. 0.11Ω

29. **A 20.0 cm wire carrying a current of 10.0 A is placed in a uniform magnetic field of 0.30 T. If the wire makes an angle of 40° with the direction of magnetic field, find the (approx) magnitude of the force acting on the wire? ($\sin 40^\circ = 0.642$)**

- A. 2.71 N
- B. 0.39 N
- C. 6.61 N
- D. 7.61 N
- E. 9.91 N

30. **A circuit in which there is a current of 10 amperes is changed so that the current falls to zero in 0.5 seconds. If an average e.m.f. of 400 volts is induced, what is the self inductance of the circuit?**

- A. 10 henrys
- B. 20 henrys
- C. 30 henrys
- D. 40 henrys
- E. 50 henrys



31. Identify the instrument/s which is/are used for the measurement of resistance:

- I. Wheatstone Bridge
- II. Meter Bridge
- III. Post office Box
- IV. Ohmmeter

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

32. In a certain circuit, a transistor has a collector current of 10 mA and a base current of 40 μ A. What is the current gain of the transistor?

- A. 150
- B. 200
- C. 250
- D. 300
- E. 350

33. A particle of mass 5 mg moves with speed of 8 m/s. Calculate its de Broglie wavelength ($h = 6.63 \times 10^{-34}$ Js)

- A. 0.71×10^{-29} m
- B. 1.66×10^{-29} m
- C. 2.66×10^{-29} m.
- D. 3.77×10^{-29} m
- E. 5.71×10^{-29} m

34. X-rays are also known as:

- A. Rydberg rays
- B. Roentgen rays
- C. Ultraviolet rays
- D. Zig-zag rays
- E. Ruby rays

35. When we measure the nuclear masses and compare them with the masses of the constituent nucleus in free states. The mass of the nucleus is always less than the mass of the constituent nucleons. This difference in mass is known as:

- A. Mass Defect
- B. Mass Value
- C. Mass Disorder
- D. Mass Energy
- E. Mass Nucleus



36. _____ are very high energy electromagnetic radiations of extremely short wavelength emitted from the nuclei of radioactive atoms originating from the high energy transitions of the nucleons in the nuclei.

- A. Alpha rays
- B. Beta rays
- C. Gamma rays
- D. Electromagnetic rays
- E. Ultraviolet rays

37. Kelvin, is the unit of thermodynamic temperature, which is _____ of the thermodynamic temperature of the triple point of water.

- A. $1 / 100.6$
- B. $1 / 273.16$
- C. $1 / 32.6$
- D. $1 / 241.5$
- E. $1 / 115.7$

38. Two forces of magnitude 10 N and 20 N act on a body in directions making angles 30° and 60° respectively with x-axis. What is the resultant force?

- A. 17 N
- B. 19 N
- C. 23 N
- D. 29 N
- E. 37 N

39. A 100 ka golf ball is moving to the right with a velocity of 20 m/s. It makes a head on collision with an 8 kg steel ball, initially at rest. Compute velocities of the balls after collision?

- A. -19.5 m/s and 0.5 m/s
- B. -17.1 m/s and 1.5 m/s
- C. - 15.1 m/s and 2.5 m/s
- D. -13.7 m/s and 3.5 m/s
- E. -11.9 m/s and 6.7 m/s

40. Two bodies 'X' and 'Y' are attached to the ends of a string which passes over a pulley so that the two bodies hang vertically. If the mass of the body 'X' is 5 kg and that of body 'Y' is 4.8 kg. Find the acceleration? ($g = 9.8 \text{ m/s}^2$)

- A. 0.2 m/s^2
- B. 1.7 m/s^2
- C. 3.7 m/s^2
- D. 4.9 m/s^2
- E. 9.1 m/s^2



CHEMISTRY

41. In which of the following compound carbon uses sp^3 hybrid orbitals for bond formation?

- A. C_2H_6
- B. C_2H_4
- C. $(CH_3)_3COH$
- D. $CH_2=C=O$

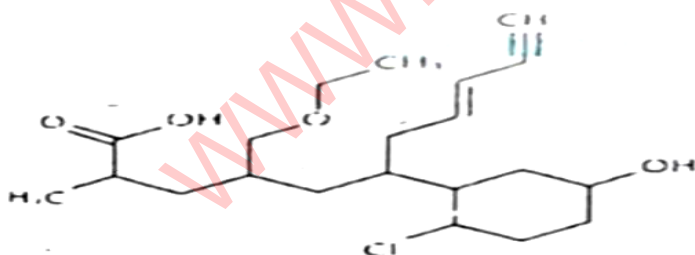
42. The table shown below gives the bond dissociation energies of single covalent bonds of carbon atom with elements A, B, c and d.

BOND	$K_{\text{dissociation}}$ (Kj.mole ⁻¹)
C - A	240
C - B	328
C - C	276
C - D	485

Which of the following is the smallest atom ?

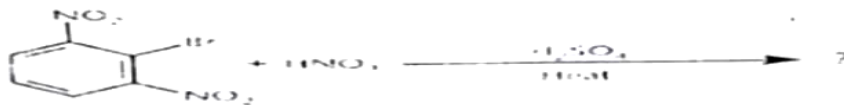
- A. A
- B. B
- C. C
- D. D

43. The IUPAC name for the structure below ends with what suffix?



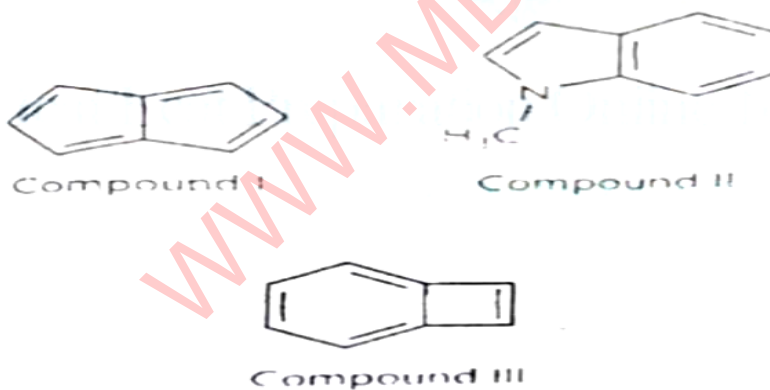
- A. -ol
- B. -ide
- C. -oic acid
- D. -yne

44. What is the major product of nitration reaction below?



- A.
- B.
- C.
- D.

45. Which of the molecules shown below are aromatic?



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



46. What are the major products of the reaction shown below?



- A. Phenol and bromopropane
- B. Bromobenzene and propanol
- C. Bromobenzene and propane
- D. Benzene and propane

47. Commercial hydrogen is obtained from:

- A. coal gas
- B. oil gas
- C. marsh gas
- D. producer gas

48. The ionization of hydrogen atom gives :

- A. hydride ion
- B. hydronium ion
- C. proton
- D. hydroxyl ion

49. Which is most basic in character?

- A. RbOH
- B. KOH
- C. LiOH
- D. NaOH

50. Oxygen does not react with:

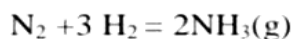
- A. P
- B. Na
- C. S
- D. Cl



51. Physical properties of Ethyne is/are:

- A. It is colourless gas with sweet smell
- B. It is sparingly soluble in water
- C. It is less denser than air
- D. It explodes on compression to a liquid because of unstable nature
- E. All of the above .

52. How will the equilibrium of the following reaction be affected if additional nitrogen is added?



- A. It will be shifted to the right.
- B. It will be shifted to the left.
- C. It will be unaffected.
- D. The effect on the equilibrium cannot be determined without more information.
- E. More NH₃ will be produced.

53. NH₃ (amine) is an example of:

- A. Negative ligand
- B. Anionic ligand
- C. Neutral ligand
- D. Organic ligand
- E. Both A and B

54. the hybridization of atomic orbitals of N in N₂, NO₃ and NH₄ are, respectively:

- A. sp, sp², sp³
- B. sp, sp³, sp²
- C. sp², sp, sp³
- D. sp², sp³, sp

55. The dipole moments of the given molecules (BF₃, NF₃, NH₃) are such that:

- A. BF₃ > NF₃ > NH₃
- B. NF₃ > BF₃ > NH₃
- C. NH₃ > NF₃ > BF₃
- D. NH₃ > BF₃ > NF₃
- E. NH₃ = BF₃ = NF₃



56. The unit cell with crystallographic dimensions $a = b \neq c$, $\alpha = \beta = \gamma = 90^\circ$ is:

- A. Cubic
- B. Tetragonal.
- C. Monoclinic
- D. Hexagonal

57. H_2O has a higher boiling point than HF because:

- A. H_2O is more polar than HF
- B. H_2O can form more hydrogen bonds
- C. H_2O has a higher molecular weight
- D. H_2O has more atoms
- E. H_2O does not have a higher boiling point than HF

58. Which of the following best describes the emission spectrum of atomic hydrogen?

- A. a discrete series of lines of equal intensity and equally spaced with respect to wavelength
- B. a series of only four lines
- C. a continuous emission of radiation of all frequencies
- D. several discrete series of lines with both intensity and spacings between lines decreasing as the wavenumber increases with each series.

59. Ethyl alcohol when treated with concentrated H_2SO_4 may give: C.

- A. only diethyl sulphate
- B. only diethyl ether
- C. only ethylene
- D. all of the above

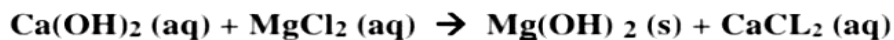
60. Strontium lies between calcium and barium in Group IIA in the Periodic Table. Which of the following properties could be predicted for strontium?

- A. It forms a water-soluble carbonate which does not decompose on heating.
- B. It forms a sparingly soluble sulphate.
- C. It forms a nitrate which decomposes on heating to form strontium nitrite and oxygen.
- D. It is reduced by cold water, liberating hydrogen.



61. Magnesium oxide is used in the making of the lining of blast furnaces. It is extracted from seawater as follows.

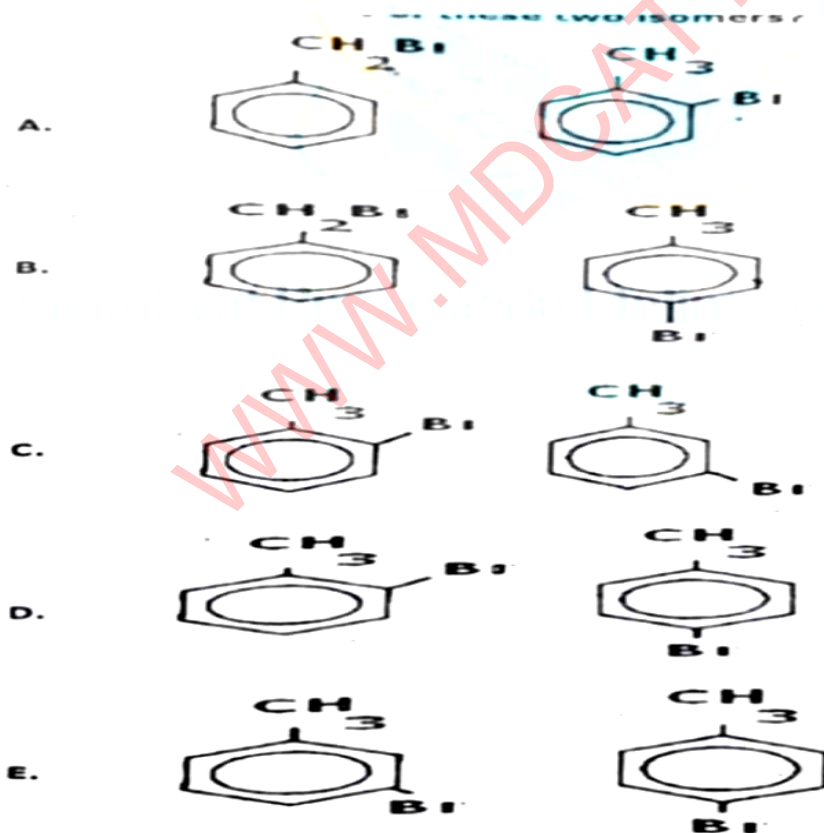
Aqueous calcium hydroxide is added to seawater.



The magnesium hydroxide is then filtered off and roasted. Which of the following comparisons between calcium and magnesium explains why magnesium hydroxide forms?

- A. Magnesium is less electropositive than calcium.
- B. Magnesium is lower than calcium in the reactivity series.
- C. The enthalpy change of hydration for Mg^{2+} is less exothermic than for Ca^{2+} .
- D. The solubility product for Mg(OH)_2 is lower than that for Ca(OH)_2 .
- E. The magnitude of the lattice energy of Mg(OH)_2 is less than that of Ca(OH)_2 .

62. When methylbenzene is treated with bromine in the presence of a catalyst, a mixture of two monobromo isomers is formed. What are the structures of these two isomers?



63. The series limit for the Balmer series of hydrogen spectrum occurs at 3664 Å. Calculate Ionization energy of hydrogen atom.

- A. 21.7×10^{-19} J
- B. 6.626×10^{-34} J
- C. 5.425×10^{-19} J
- D. 3664×10^{-10} J
- E. 3×10^8 J

64. Bond energy between nitrogen atoms in N_2 molecule is:

- A. 242 KJ mol⁻¹
- B. 820 KJ mol⁻¹
- C. 498 KJ mol⁻¹
- D. 347 KJ mol⁻¹
- E. 946 KJ mol⁻¹

65. The solubility product for $Baso_4$ at 18-25°C is:

- A. 1.0×10^{-10} mole² dm⁻⁶
- B. 8.7×10^{-36} mole² dm⁻⁶
- C. 1.8×10^{-21} mole² dm⁻⁶
- D. 8.4×10^{-28} mole² dm⁻⁶
- E. 3.5×10^{-52} mole² dm⁶

66. Atomic number of C is 6 and H is 1. How many electrons are present in 1.6 grams of methane?

- A. 6.02×10^{23}
- B. 1.204×10^{23}
- C. 1.806×10^{23}
- D. 2.408×10^{23}
- E. 3.01×10^{23}

67. A bottle of cold drink contains 200 ml liquid in which CO_2 is 0.1 molar. Suppose CO_2 , behaves like an ideal gas, the volume of dissolved CO_2 , at S.T.P is:

- A. 0.224 litre
- B. 0.448 litre
- C. 22.4 litre
- D. 2.24 litre
- E. 25.5 litre



68. Surface tension in a liquid is caused by:

- A. a lack of horizontal intermolecular forces
- B. greater rate of evaporation at the surface than from the interior
- C. reduced rate of intermolecular collisions at the surface
- D. greater fluidity

69. How many electrons can have the values $n = 2$, $l = 1$ and $s = + 1/2$ in the configuration $1S^2, 2S^2, 2p^3$?

- A. 1
- B. 3
- C. 5
- D. 7
- E. 9

70. If uncertainty in the position of an electron is zero, the uncertainty in its momentum is:

- A. 1
- B. zero
- C. 2π
- D. $h/4\pi$
- E. infinite



BIOLOGY

71. The statements are all descriptions of cell structures.

1. surrounded by a single membrane and enclosing a large fluid-filled space
2. surrounded by a single membrane and enclosing digestive enzymes
3. formed by two membranes enclosing a matrix, the inner membrane is folded
4. formed by a membrane that has flattened sacs and tubular structures interconnected throughout the cell
5. formed of nucleic acid and protein

Which row shows the typical cell in which these cell structures are found?

	Plant Cell	Animal Cell
A	1,3,4 and 5	2,3,4 and 5
B	1,2,3 and 4	1,2,3 and 5
C	2,4 and 5	1,4 and 5
D	3,4 and 5 only	2,3 and 5 only

72. A short piece of DNA 30 base pairs long was analyzed to find the number of nucleotide bases in each of the polynucleotide strands. Some of the results are shown below.

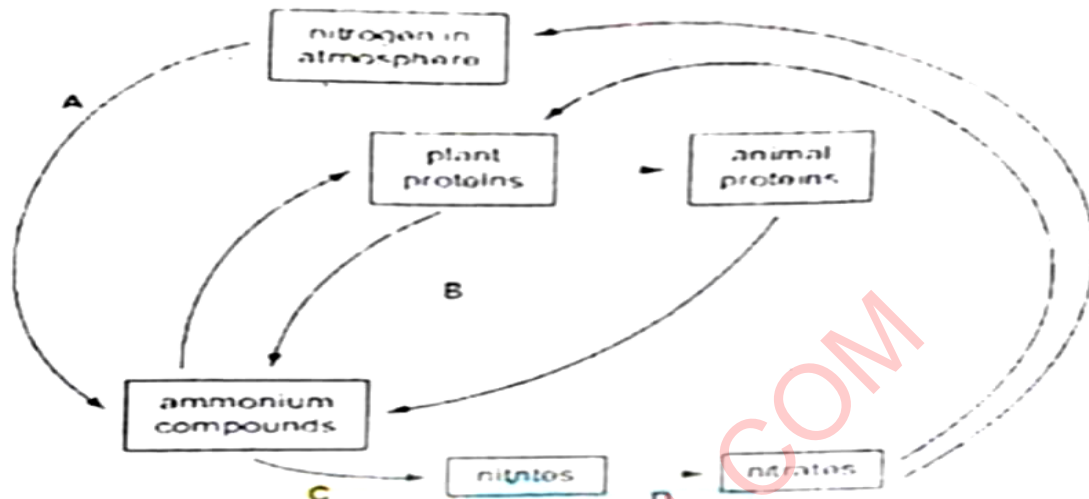
	Number of nucleotide bases			
	A	C	G	T
Strand 1		12		6
Strand 2				8

How many nucleotides containing guanine were present in strand 1?

- A. 2
- B. 3
- C. 4
- D. 6



73. The diagram shows a simplified nitrogen cycle. During which stage does decomposition start?



- A. A
- B. B
- C. C
- D. D

74. Antheridia and archegonia are _____ organs in bryophytes .

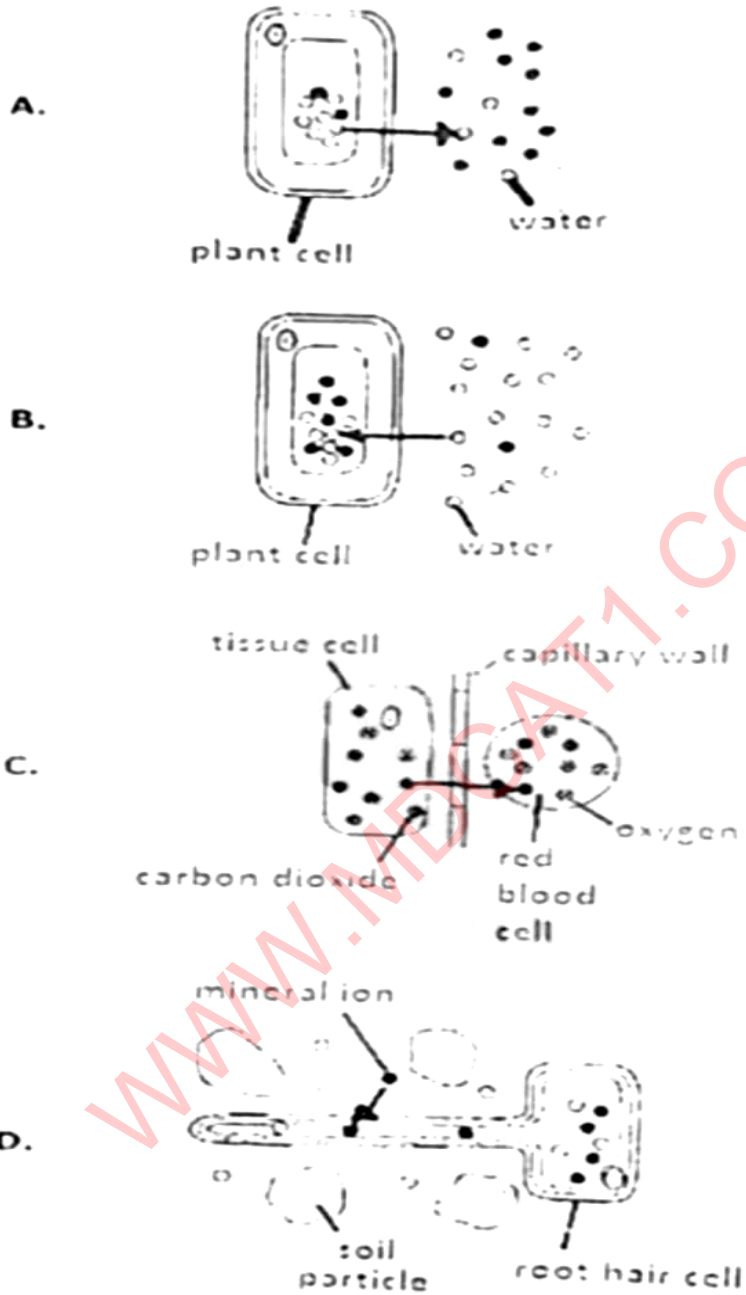
- A. reproductive
- B. digestive
- C. respiratory
- D. none of the above

75. Which of the following statements is true about savannah?

- A. dry season is very long and temperature ranges more than 18°C throughout the year
- B. its plants do not shed off their leaves
- C. the sub soil is permanently frozen
- D. rain fall is upto 200 cm per year.
- E. evaporation exceeds rainfall

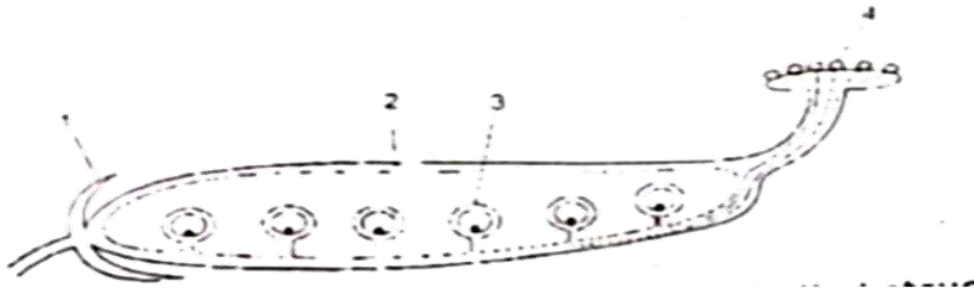


76. Which diagram illustrates the process of active transport .



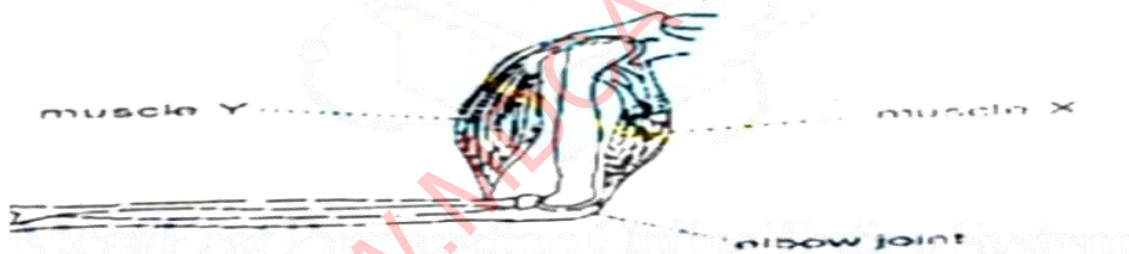
77. The diagram shows part of a flower after it has been pollinated.

Which row correctly identifies one of the labelled structures?



	Labeled structure	Flower part
A	1	Stigma
B	2	Pericarp
C	3	Radicle
D	4	Seed

78. The diagram shows some of the muscles and bones of the human arm.



When muscle X contracts, what happens to the arm and what happens to muscle Y?

	Arm	Muscle y
A	Bends	Contracts
B	Bends	Relaxes
C	Straightens	Relaxes
D	Straightens	Contracts



79. What happens to the volume of the thorax and the air pressure the lungs during breathing in?

	Volume of thorax	Air pressure in lungs
A	Decreases	Increase
B	Decreases	Remain constant
C	Increases	Increases
D	Increases	Remain constant
E	Increases	Decreases

80. Dietary fiber passes through several structures after leaving the stomach. In which order does the dietary fibre pass through these structures?

- A. duodenum → jejunum → ileum → rectum → colon
- B. ileum → duodenum → colon → jejunum → rectum
- C. ileum → duodenum → jejunum → rectum → colon
- D. colon → duodenum → ileum → rectum → jejunum
- E. duodenum → jejunum → ileum → colon → rectum

81. The scientific name of Thorn apple is:

- A. Sycopodium phlegmaria
- B. Anthoceros fusiformis
- C. "Ginkgo bilobo
- D. Datura alba
- E. Agaricus bisporus

82. The following statements are about enzymes:

1. They are globular proteins.
2. They can be inhibited by competitive inhibitors.
3. They are formed in the smooth endoplasmic reticulum.
4. They are only found attached to plasma membranes in the cell.

Which statements are correct for all enzymes?

- A. 1 and 4 only
- B. 2 and 4 only
- C. 1 and 2 only
- D. 1, 2, 3 and 4



83. The diagram shows a section through the human brain.

What are some functions of the parts labelled 1, 2 and 3?

	1	2	3
A	Heart beat and blood pressure	Forms visual images	Controls digestion
B	Perception of pleasure and pain	Muscular coordination	Heart beat and blood pressure
C	Muscular coordination	Heart beat and blood pressure	Perception of pleasure and pain
D	Perception of pleasure and pain	Controls digestion	Heart beat and blood pressure
E	Muscular coordination	Perception of pleasure and pain	Heart beat and blood pressure

84. Which one of the following combinations of statements is true of saccharides in living organisms?

	They provide energy	They form storage compounds	They form supporting structure
A	No	No	Yes
B	No	No	No
C	Yes	No	No
D	Yes	Yes	No
E	Yes	Yes	Yes

85. The table refers to blood vessels in the human body

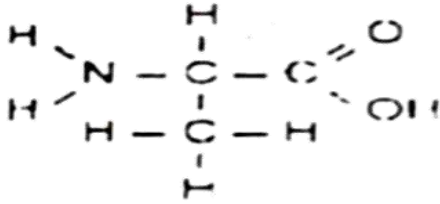
Vessel	Blood carried		Oxygenated / deoxygenated
	From	To	
Aorta	Lungs	All organs except lungs	Oxygenated
Pulmonary vein	Aorta	heart	Q
Hepatic artery	Alimentary Canal	R	Oxygenated
Hepatic portal vein	Canal	Liver	s

What are P, Q, R and S?

	P	Q	R	S
A	Left ventricle	Deoxygenated	Kidney	Deoxygenated
B	Left ventricle	Oxygenated	Liver	Deoxygenated
C	Right ventricle	Deoxygenated	Kidney	Oxygenated
D	Right ventricle	Oxygenated	Liver	Oxygenated



86. The diagram shows a molecule.



Which substance might include the above molecule?

- A. Cellulose
- B. Serine
- C. Glucose
- D. Alanine

87. During the formation of an ovum, non-disjunction of the sex chromosomes occurred. The ovum was then fertilized by a normal, Y-bearing sperm cell. Which one of the following shows the sex chromosome complement of the resulting zygote?

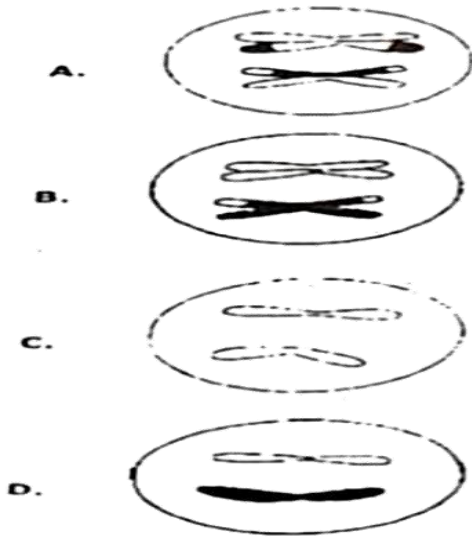
- A. Xo
- B. Xy
- C. Xxy
- D. Xxxy
- E. Xxyy

88. The diagram shows a cell at anaphase 1 of meiosis .



which diagram shows a normal gamete that could be produced from this cell?





89. Five different amino acids (numbered 1-5 below) form the Following sequence in part of a polypeptide chain:

1- 2- 3- 4-2-5-3

Messenger RNA (MRNA) codons which correspond to these amino acids are:

amino acid 1	UGU
amino acid 2	GAU
amino acid 3	CAC
amino acid 4	UAG
amino acid. 5	AAG

Which one of the following DNA base sequences could provide the code for the given section of polypeptide?

- A. A C A C T T G T G A T G C T A T T C G T G
- B. A C A C U A G U G A U G C U A U U C G U G
- C. A C A C T A G T G A T G C T A A A C G T G
- D. A C A C T A G T G A T C C T A T T C G T G
- E. C A C A T C U T U C T U A T C T T A U T U

90. The following sequence of events occurs at the neuromuscular junction.

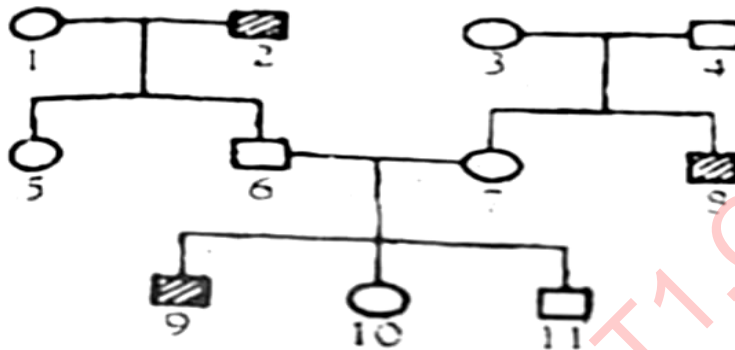
nerve impulse → release of V → end plate potential → W produced in muscle fibre --> X released from sarcoplasmic reticulum → formation of Y → muscle contraction:

Which one of the following shows the correct sequence from V →



	V	W	X	Y
A	acetylcholine	Action potential	Calcium ions	Actomyosin
B	acetylcholine	Action potential	Actomyosin	Calcium ions
C	Actomyosin	Acetylcholine	Calcium ions	Action potential
D	Calcium ions	Action potential	Acetylcholine	Actomyosin
E	Calcium ions	Actomyosin	Acetylcholine	Action potential

91. The diagram shows the inheritance of haemophilia in a FAMILY .



key to phenotypes

- normal female
- haemophilic female
- normal male
- ▨ haemophilic male

key to chromosome types

- X^H = normal X chromosome
- X^h = X chromosome carrying allele for haemophilia
- Y = normal Y chromosome

What is the genotype of person 7?

- A. $X^H X^H$
- B. $X^H Y$
- C. $X^H X^h$
- D. $X^h X^h$
- E. $X^h X$

92. Which of the following types of cell are found in the secondary xylem of angiosperms?

- A. tracheids, parenchyma, fibres, collenchyma but no vessels
- B. vessels, tracheids, parenchyma, collenchyma but no fibres
- C. vessels, tracheids, fibres, collenchyma but no parenchyma
- D. vessels, tracheids, fibres, parenchyma but no collenchyma
- E. vessels, fibres, parenchyma, collenchyma but no tracheids



93. The floral formula of family caesalpiniaceae or casia family is:

- A. $\oplus, \text{♀}, K_{(5)}, \overline{C_{(5)}}, A_5, \underline{G}_{(2)}$
- B. $+, \text{♀}, K_{(5)}, C_{1+2+(2)}, A_{(9)+1}, \underline{G}_1$
- C. $+, \text{♀}, K_{(5) \text{ or } 5}, C_5, A_{10}, \underline{G}_1$
- D. $\oplus, \text{♂}, K_{(5)}, C_{5 \text{ or } (5)}, A_{10 \text{ or } (10)}, \underline{G}_1$
- E. None of the above

94. The following observations refer to evolution:

- I. Inherited variations which are 'favoured' in particular environment are passed on.
- II. There is a struggle for existence.
- III. In time, 'favoured' inherited variations may accumulate causing gradual changes in the organism.
- IV. Although populations tend to overproduce, they remain more or less constant in numbers from generation to generation.

In what sequence should the statements be placed to support Darwin's theory of evolution?

- A. I, II, III, IV
- B. II, I, III, IV
- C. III, I, IV, II
- D. IV, I, II, III
- E. IV, II, I, III

95. Identify the bones in which the connecting joints are freely moveable joints:

- A. Ankle
- B. Wrist
- C. Vertebrae
- D. Elbow
- E. All of the above



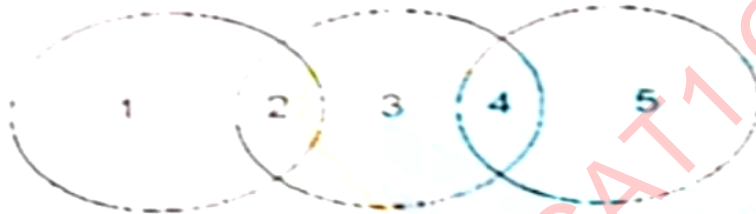
96. The egg of a chick is laid at which of the following stages?

- A. gastrula
- B. Blastula
- C. cleavage
- D. Morula
- E. neurulation

97. class Elasmobranchi have an exoskeleton of:

- A. placoid scales
- B. cycloid scales
- C. ctenoid scales
- D. epidermal scales

98. The diagram shows some similarities between golgi apparatus, mitochondria and suicide sacs.



	1	2	3	4	5
A	Golgi apparatus	enzymes	mitochondria	Membrane bond	Suicide sacs
B	Golgi apparatus	Enzymes	Mitochondria	Membrane bond	Suicide sacs
C	Suicide sacs	Non Membrane bond	Golgi apparatus	Enzymes	mitochondria
D	Suicide sacs	Membrane bond	mitochondria	Membrane bond	Golgi apparatus

99. An example of passive acquired immunity is:

- A. vaccination against smallpox
- B. use of polio vaccine passing
- C. of certain antibodies to the fetus by the pregnant woman
- D. inoculation of antitoxin in case of a puncture wound
- E both C & D



100. Four words are shown below:

facultative obligate saprophytes parasites

These words can be used in the spaces P, Q, R and S to complete the sentence below.

Among heterotrophic plants those which depend on living plants and animals for their nutritional requirements are known as ...P... Parasites which depend for their nutrition entirely on other living organisms are known as ...Q... or total parasites and those which depend for these requirements partially on other living organisms are called ...R... or partial parasites. On the other hand, the plants which depend on dead or rotten organic remains of plants and animals are called ...S....

	Obligate	Parasites	Saprophytes	Facultative
A	P	Q	R	S
B	Q	P	S	R
C	R	S	Q	P
D	S	R	Q	P



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

