gradeup

NVS TGT 2016

Science Question Paper

Part – V
SCIENCE

121. The correct order of negative electron gain enthalpy of halogens is
A. F > Cl > Br > I B. I > Br > Cl > F
C. Br > I > F > Cl D. Cl > F > Br > I

122. Which one of the following statements is not valid for Heisenberg's uncertainly principle?
A. When uncertainty in position increase, the uncertainty in velocity decreases.
B. When uncertainty in position increases, the certainty in velocity also increases.
C. When certainty in position decreases, the certainty in velocity increases.
D. When certainty in position increases, the uncertainty in velocity decreases.

123. What would be the IUPAC name and symbol for the element with atomic number 117?
A. Ununheptium (Uuh)
B. Methmethheptium (Mmh)
C. Ununseptium (Uus)
D. Methnilheptium (Mnh)

124. What is the correct order of non-metallic character among the elements B, C, N, F and Si?
A. Si > C > B > N > F
B. F > N > C > B > Si
C. B > C > Si > N > F
D. F > N > C > Si > B

125. Consider the following characteristics about electronegativity of elements:
I. It is constant for a given element.
II. It is tendency of an element to attract bonded electrons towards itself.
III. It is measurable quantity.
IV. Its unit is kJ/mol.
Choose the correct option:
A. II is correct only.
B. I and II are correct.
C. I, II and III are correct.
D. II, III and IV are correct.

126. Consider the following facts for ionic product of water:
I. $pK_w = 14$ (independent for temperature)
II. $pK_w = pK_a + pK_b$
III. $pK_w = pH + pOH$
IV. $pH = \frac{1}{2}(pK_w + pK_a - pK_b)$ for salts of weak acid and weak base.
Choose the correct option:
A. I and III are correct.
B. I and II are correct.
C. II and III are correct.
D. II, III and IV are correct.

127. What is the pH of ammonium acetate solution if, pK_a of acetic acid and pK_b of ammonium hydroxide are 4.76 and 4.75 respectively?
A. 0.010 B. 7.000
C. 7.005 D. 0.020

128. Consider the following statements about rancidity of fats/oils:
I. It is an oxidation process.
II. It can be prevented by adding BHA.
III. Its degree is not measured as RM value.
IV. Its degree is measured as Iodine value.
Choose the correct option:
A. I and IV correct only.
B. I, II and IV are correct only.
C. I, II and III are correct only.
D. II and III are correct only

129. Which one chemical substance is used in photo-chromatic eye glasses for dark colouration in sunlight?
A. Black dye
B. Mercury
C. Potassium Permanganate
D. Silver chloride

130. Which one of the following pairs is correctly matched?

List – I (Name of metal)	List – II (Name of ore)
I. Manganese	a. Fool's gold
II. Iron	b. Calamine
III. Zinc	c. Cinnabar
IV. Mercury	d. Pyrolusite
	e. Iron pyrite

Code:

	I	II	III	IV
A.	d	e	c	b
B.	c	a	b	d
C.	d	a	b	c
D.	c	e	d	b

131. What are the carbon-carbon bond angles in chair and boat conformational isomers of cyclohexane respectively?
A. 109.5°, 109.5° B. 109.5°, 120°
C. 120°, 109.5° D. 120°, 120°

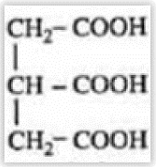
132. Which one of the following has the lowest, pK_a value?
A. Ethanol
B. Isopropanol
C. 2, 2, 2 – Trifluoroethanol
D. 2-Chloroethanol

133. Which one of the following is Incorrect about a layer of Al_2O_3?
A. It prevents further corrosion.
B. It prevents reaction with conc.HNO_3.
C. It is resistant to dye.
D. It is formed by anodizing process.

134. Which one of the following metals exhibits the highest oxidation state?
A. Mn B. Cr

C. Fe D. V

135. What is the IUPAC name of the following compound?



A. Hexane – 1, 3, 5 – trioic acid
B. Propane – 1, 2, 3 – trioic acid
C. 3-carboxypentane – 1, 5 – dioic acid
D. Propane – 1, 2, 3 – tricarboxylic acid

136. Reagents required for the conversion are respectively

A. BH_3 / THF; H_2O_2 / $O\bar{H}$, $C_5H_5\overset{+}{N}HC\bar{l}$ / CrO_3

B. BH_3 / THF, H_2O_2 / $O\bar{H}$, $KMnO_4$ / H_2SO_4

C. $Hg(OAC)_2$ / THF – H_2O; $NaBH_4$ / OH^-

D. H_2O / H^+; $C_5H_5\overset{+}{N}HCl^-$ / CrO_3

137. Which one of the following pairs is correctly matched?

	List – I (Reaction)		List – II (Reactant)
I.	Reacts fastest with Lucas reagent	a.	CH_3CH_2OH
II.	Gets easily Oxidized by $K_2Cr_2O_7/H_2SO_4$	b.	C_3H_5OH
III.	Produces blue colouration in Victor-Meyer Test	c.	$(CH_3)_3COH$
IV.	Produces violet colouration with neutral $FeCl_3$	d.	$CH_3CH_2CH(OH)CH_3$

Code:

	I	II	III	IV
A.	b	a	c	d
B.	c	a	d	b
C.	b	d	c	a
D.	c	d	b	a

138. Choose the correct order of decreasing strength of intermolecular forces among the following polymers:
A. Nylon-6 > Buna-S > Polystyrene
B. Polystyrene > Nylon-6 > Buna-S
C. Buna-S > Polystyrene > Nylon-6
D. Polystyrene > Buna-S > Nylon-6

139. **Instruction:** The question given below consists of two statements, an Assertion (A) and a Reason (R)

Indicate your answer from alternative given below:

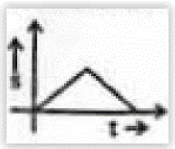
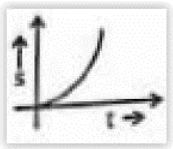
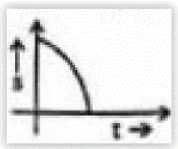
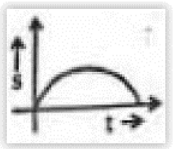
Assertion (A): Soap does not work in hard water.

Reason (R): Soap does not form micelles below its Critical Micelle Concentration (CMC).

In the context of the above two statements, which one of the following in correct?
A. Both (A) and (R) are true and (R) is the correct explanation.
B. Both (A) and (R) are true but (R) is not the correct explanation.
C. (A) is true but (R) is false.
D. (A) is false but (R) is true.

140. What is the purpose of adding gypsum in Portland cement?
A. To lessen the cost of manufacturing
B. To slow down the process of setting.
C. To increase the brightness
D. To make it miscible with sand.

141. Which one of the following displacement (s) – time (t) graphs correctly represent the motion of a body thrown vertically up and falling back to the point of projection?

A. 
B. 
C. 
D. 

142. One radiant is about
A. 37° B. 45°
C. 57° D. 90°

143. Water drops fall at regular intervals from a leaking water tap 20 m above the ground. The third drop is leaving the tap at the instant the first drop touches the ground. The height of the second drop above the ground at that instant is (take g = 10 m/s^2)
A. 5 m B. 7.5 m
C. 12.5 m D. 15 m

144. Three points A, B and C are in a vertical line such that AB = BC. A ball is dropped from the top most point A falls freely so as to pass through B and C. The ratio of the times of descent through AB and BC is

A. $\sqrt{2}$ B. $\frac{\sqrt{3}}{\sqrt{2}-1}$
C. $\frac{3}{\sqrt{3}-1}$ D. $\frac{1}{\sqrt{2}-1}$

145. A tiny object is acted upon by a force of constant magnitude which is always

perpendicular to the velocity of the object. The motion of the object. The motion of the object takes place in a plane. Select from the following the correct statements about the motion of the object:

I. Its velocity is constant.
II. Its acceleration is constant.
III. It moves along a circular path.
IV. Its kinetic energy is constant.

A. I and III B. III and IV
C. I II D. II, III and IV

146. Match the entries in Column I with appropriate ones from Column II:

Column – I	Column – II
a. Force	I. J/s
b. Impulse	II. Nm
c. Pressure	III. Ns
d. Power	IV. Pa
e. Potential energy	V. K
	VI. J/m

	a	b	c	d	e
A.	VI	III	I	IV	II
B.	VI	III	IV	I	II
C.	I	III	IV	VI	V
D.	I	III	V	IV	II

147. A force of 20 N first acts on a body of mass 2 kg and then on a body of mass 2.5 kg. If these bodies were at rest initially and force acted on them for 2 seconds, the ratio of their momenta and kinetic energies would be respectively.

A. 4 : 5, 5 : 4 B. 1 : 1, 4 : 5
C. 1 : 1, 5 : 4 D. 5 : 4, 4 : 5

148. A car and a minibus have masses M and 5 M respectively. When they were moving with equal momenta, the brakes applied to each of them produced equal negative acceleration. The ratio of the distances covered by the car and the minibus before coming the rest would be

A. 50 : 1 B. 25 : 1
C. 10 : 1 D. 5 : 1

149. Three blocks of masses 10 kg, 6 kg and 4 kg lie on a frictionless horizontal surface. The masses are connected together by light strings. A string attached to 4 kg block pulls the three blocks horizontally. If the system of blocks is accelerated at 0.5 m/s^2, the tension in the string connecting the 4 kg and 6 kg blocks is

A. 3 N B. 5 N
C. 8 N D. 10 N

150. An old man does 1000 J of work in 50 s and a young boy does 2000 J of work in 80 s. The ratio of the power delivered by the old man to that by the young boy is

A. 5 : 2 B. 5 : 4
C. 4 : 5 D. 2 : 5

151. An aeroplane is flying horizontally at a vertical height of 500 m with a velocity of 20 m/s over a flood affected area. Food packets are to be dropped for the people standing at a particular place on the ground. At what horizontal distance from that place should the food packets be released from the aeroplane so as to reach the needy people?
(Take g = 10 m/s^2)

A. 500 m B. 400 m
C. 300 m D. 200 m

152. The gravitational force with which the sun attracts the earth

I. varies inversely with square of the distance between them.
II. is more than the force with which the earth attracts the sun.
III. is less than the force with which the earth attracts the sun.
IV. is same as the force with which the earth attracts the sun.

Which of the above statements is/are correct?

A. IV only B. II only
C. I and III D. I and IV

153. If universal gravitation constant G = 6.67×10^{-11} $Nm^2 kg^{-2}$;
Radius of the earth R = 6.4×10^6 m and Acceleration due to gravity on the surface of earth g = 10 ms^{-2}, the mass of the earth in kilograms must be nearly

A. 6×10^{22} B. 9×10^{22}
C. 6×10^{24} D. 9×10^{24}

154. Equal mass of three liquids A, B and C of densities ρ_A, ρ_B and ρ_C respectively $(\rho_A < \rho_B < \rho_C)$ are kept in three identical cylindrical vessels. The pressure exerted by the liquids at the base will be

A. minimum in A
B. maximum in C
C. equal in all the three
D. maximum in A

155. A beaker containing liquid is placed on the pan of a platform balance. When an iron sphere suspended from a spring balance is immersed in the liquid contained in the beaker without touching the walls of the beaker, then the amount of increase of weight of the beaker shown by the platform balance is equal to

a. zero
b. the actual weight of the sphere
c. the weight of the displaced liquid
d. decrease in weight shown by the spring balance

The correct options are

A. a and b B. b and c

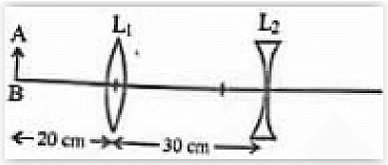
C. c and d D. a and d

156. For simple harmonic motion, the magnitude of the acceleration is greatest when the
A. velocity is maximum
B. displacement is maximum
C. displacement is zero
D. force is zero

157. A wave is described by
$y(x,t) = 0.2 \sin(3x + 12t)$
where x is in metres, y is in centimetres and t is in seconds. The wavelength is
A. $\frac{\pi}{3}$ m B. $\frac{2\pi}{3}$ m
C. $\frac{4\pi}{3}$ m D. 3π m

158. Rays from the sun coverage at a point 20 cm in front of a concave mirror. To obtain an image of magnification +2, the object should be placed in front of the mirror at a distance of
A. 10 cm B. 15 cm
C. 20 cm D. 30 cm

159. In the given diagram if both the lenses L_1 and L_2 and of 10 cm focal length, the final image of AB formed by the lens L_2. Will be

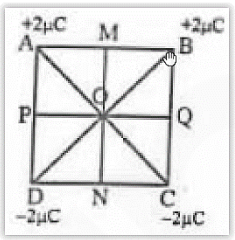


A. Real and magnified two times
B. Virtual and magnified $\frac{1}{4}$ times
C. Real and magnified $\frac{1}{2}$ times
D. Virtual and magnified $\frac{1}{2}$ times

160. The refraction index of following transparent material medium with respect to air are given below:
water ${}_a\mu_w = 1.33$; glass ${}_a\mu_g = 1.5$
kerosene ${}_a\mu_k = 1.44$; diamond ${}_a\mu_d = 2.42$
Which of the following is the correct order of refractive indices when light travels from one medium to the other?
A. ${}_a\mu_w > {}_k\mu_g > {}_w\mu_k > {}_g\mu_d$
B. ${}_g\mu_d > {}_a\mu_w > {}_w\mu_k > {}_k\mu_g$
C. ${}_a\mu_w > {}_g\mu_d > {}_k\mu_g > {}_w\mu_k$
D. ${}_k\mu_g > {}_w\mu_k > {}_g\mu_d > {}_a\mu_w$

161. A ray of light incident at an angle θ on the face AB of a prism of refractive index 1.5 emerges normally from its face AC. If angle of prism is 5°, the angle of incidence θ should be nearly
A. 2.5° B. 7.5°
C. 22.5° D. 82.5°

162. Four charges + 2μC, + 2 μC, −2μC and −2μC are placed at the corners of a square of side 10 cm as shown in the figure. The resultant electric field at the centre O of the square is directed towards.



A. OM B. ON
C. OP D. OQ

163. A 2μF and a 4μF capacitors are connected in series and a potential difference is applied to the combination. The 4 μF capacitor has
A. twice the potential difference of the 2 μF capacitor.
B. half the potential difference of the 2 μF capacitor.
C. twice the charge of the 2 μF capacitor.
D. half the charge of the 2 μF capacitor.

164. The power line enters a big hall after passing through 5.0 A fuse. In this hall LED bulbs rated as 10 W; 220 V are to be used. If the supply is at 220 V, the maximum number of bulbs that can be used simultaneously in this hall would be
A. 11 B. 22
C. 55 D. 110

165. The filament of an electric bulb draws a current of 0.05 A from a 200 V source. The power of the bulb and the number electrons (charge = 1.6×10^{-19}C) passing through a cross section of the filament in 5 minutes respectively are
A. 10 W ; $\simeq 9 \times 10^{19}$
B. 100 W ; $\simeq 9 \times 10^{19}$
C. 10 W ; $\simeq 9 \times 10^{18}$
D. 1 W ; $\simeq 9 \times 10^{18}$

166. Match the entries of Column I with appropriate ones from Column II:

	Column – I		**Column – II**
a.	To find the direction of magnetic field due to a current carrying straight conductor.	I.	Faraday's Law
b.	To find the direction of force experienced by a	II.	Joule's law

moving charge in a magnetic field.

c. To find the direction of induced current in a coil due to its rotation in a magnetic field. — III. Ampere's right hand thumb rule

d. To find the amount of heat produced in a resistor on passing current through it. — IV. Fleming's left hand rule

V. Fleming's right hand rule

	a	b	c	d
A.	IV	IV	III	II
B.	III	I	IV	II
C.	IV	II	III	I
D.	III	IV	V	II

167. Consider the following statements:
a. There is infinite storage of fossil fuel is the earth's curst.
b. There is no problem in harnessing nuclear energy as safe disposal of spent fuel is very easy.
c. Hydro and wind energy plants cannot be considered as non-polluting sources of energy.
d. Sun may be considered as an inexhaustible source of energy.
The correct statements are
A. a and d B. b and c
C. c and d D. a, c and d

168. A pure inductor is connected to an ac source. The current in it
A. lags the voltage by one-fourth of a cycle.
B. leads the voltage by one-fourth of a cycle.
C. lags the voltage by one-half of a cycle.
D. Leads the voltage by one-half of a cycle.

169. A unicellular eukaryote has cell walls embedded with silica. The cell walls have two overlapping shells and the organism is photosynthetic. To which group is it most likely to belong?
A. Sporozoa B. Slime moulds
C. Chrysophytes D. Dinoflagellates

170. Phloem parenchyma is generally absent in
A. Mango tree B. Neem tree
C. Wheat plant D. Eucalyptus tree

171. After protein synthesis by ribosomes, the newly synthesized proteins are assisted in their folding and transport by special proteins called:
A. Dystrophin B. Coronin
C. Ribophorin D. Chaperones

172. Which of these is **not** a sexually transmitted disease?
A. Anthrax B. Gonorrhea
C. Syphilis D. Genital herpes

173. Which one of the following elements has the sedimentary type of biogeochemical cycle?
A. Carbon B. Phosphorus
C. Nitrogen D. Oxygen

174. The question consists of two statements, an Assertion (A) and a Reason (R):
Assertion (A): The extent of water pollution caused by organic matter is indicated by BOD.
Reason (R): Amount of dissolved oxygen in water gets reduced due to respiration by aquatic plants and animals
On the basis of the above two statements, choose the correct option from the option given below:
A. Both (A) and (R) are true and (R) is correct explanation of (A).
B. Both (A) and (R) are true but (R) is not correct explanation of (A).
C. (A) is true but (R) is false.
D. Both (A) and (R) are false.

175. The disease caused by Wuchereria is:
A. Ascariasis
B. Taeniasis
C. Sleeping sickness
D. Filariasis

176. A microbe which is free living in soil but forms nitrogen-fixing nodules in the roots of non-leguminous plants liks *Alnus* as a symbiont is:
A. Beijernickia B. Rhodospirillum
C. Clostridium D. Frankia

177. The type of cancer which is characterised by increased WBC count is called as:
A. Sarcoma B. Leukemia
C. Carcinoma D. Lymphoma

178. Which of these cell organelle functions as the centre around which yolk is deposited during vitellogenesis?
A. Golgi apparatus
B. Centrosome
C. Ribosome
D. Smooth endoplasmic reticulum

179. Excretory organ in *Saccoglossus* is:
A. Proboscis gland
B. Antennal gland
C. Protonephridia
D. Green gland

180. Which of the following pairs of factors would not lead to speciation?
A. Genetic drift and gene migration
B. Saltation and natural selection
C. Polyploidization and mutation
D. Linkage and mitosis

181. Mendel presented his paper at Brunn Natural Research Society in 1865 with the following title:
A. Laws of Inheritance
B. Experiments in genetics
C. Experiments in plant hybridization
D. Research on pea plant

182. The natural methods of contraception include:
A. Lactational amenorrhea, Diaphragm, Overectomy
B. Coitus interruptus, Spermicidal drug, Diaphragm
C. Coitus interruptus, lactational amenorrhea, periodic abstinence
D. Lactational amenorrhea, coitus interruptus, Diaphragm

183. Match the Column I and II and select the correct match from the options given below:

	Column – I	**Column – II**
a.	Homo habilis	I. 1400 cc
b.	Homo erectus	II. 650 – 800 cc
c.	Neanderthal man	III. 900 cc

Options:

	a	b	c
A.	II	I	III
B.	II	III	I
C.	I	II	III
D.	III	II	I

184. The question below consists of two statements, an Assertion (A) and a Reason (R). Indicate your answer from the alternatives/options given below:
Assertion (A): The spermatids are transformed into spermatozoa by the process called spermiogenesis.
Reason (R): FSH acts at the leydig cells and stimulates secretion of some factor to help in spermiogenesis.
A. Both (A) and (R) are true and (R) is correct explanation of the Assertion (A).
B. Both (A) and (R) are true but (R) is not correct explanation of the Assertion (A).
C. Assertion (A) is true but Reason (R) is false.
D. Both Assertion (A) and Reason (R) are false.

185. If a person utilizes 100 molecules of ATP for the contraction of muscles during exercise, the amount of energy released during this process would be:
A. 30.5 kJ B. 305 kJ
C. 3050 kJ D. 80.5 kJ

186. Which of the following factors would **not** facilitate the dissociation of oxyhaemoglobin in atrial blood?
A. low temperature
B. high pCO_2
C. High H^+ concentration
D. high temperature

187. Select the **wrong** statement from the following:
A. Diaphragm and external intercostal muscles contract during inspiration.
B. Diaphragm relaxes and internal intercostals muscles contract during expiration.
C. Abdominal muscles play active role in inspiration.
D. Contraction of abdominal muscles and internal intercostal muscles occurs during forceful expiration.

188. The question below consists of two statements on Assertion (A) and Reason (R). Indicate your answer from the alternatives/options given below:
Assertion (A): Casparian strips in endodermis of roots are suberized.
Reason (R): The water moves through symplastic pathway in the endodermis.
Options:
A. Both (A) and (R) are true and (R) is correct explanation of (A).
B. Both (A) and (R) are true but (R) is not correct explanation of (A).
C. (A) is true but (R) is false.
D. Both (A) and (R) are false.

189. In a person, if blood pressure is reduced, it activates the hypoosmotic centre of A, so it secretes the hormone B. Increased amount of B will C the water absorption DCT and produce D urine. A, B, C and D are respectively:
A. Hypothalamus, ADH, decrease, concentrated
B. Hypothalamus, ADH, increase, concentrated
C. Medulla oblongata, ADH, increase, diluted
D. Hypothalamus, ADH, increase, diluted

190. Match the Column – I with Column – II. Find the correct match from the options provided below:

	Column – I	**Column – II**
a.	Fovea centralis	I. Internal ear
b.	Endolymph	II. Iodopsin
c.	Iris	III. Yellow spot
d.	Cones	IV. Colour to eye

Options:

	a	b	c	d
A.	III	I	II	I
B.	II	III	I	IV
C.	II	I	IV	III
D.	III	I	IV	II

191. Which of the following statements is **wrong** regarding Auxin?
A. Auxins applications on stem cuttings initiates adventitious root formation.

B. Auxin promotes flowering in litchi and pineapple.
C. Auxin is responsible for apical dominance.
D. Auxin is responsible for bolting in rosette plant.

192. High concentration of DDT due to biomagnification in birds does not cause the following:
A. Change in calcium metabolism
B. Thickening of egg shell
C. Premature breaking of egg shell
D. Decline in bird population

193. The gases produced by the anaerobic sludge digester during sewage treatment are:
A. Butane, O_2 and Hydrogen sulphide
B. Hydrogen sulphide and CO_2 only
C. Butane and O_2 only
D. Methane, Hydrogen sulphide and CO_2

194. Choose the **wrong** statement:
A. The process of change of state directly from gas to solid without changing into liquid is called sublimation.
B. The boiling point of a liquid lowers down with the decrease of atmospheric pressure.
C. Bose-Einstein condensate is a state of matter formed by cooling a gas of extremely high density to super-low temperature.
D. The rate of evaporation of liquid increases with the decrease of the strength of intermolecular forces.

195. What is the energy required for process $He^{+}(g) \rightarrow He^{2+}(g) + \bar{e}$ if the ionization energy for H atom in the ground state 2.18×10^{-18} J/atom?
A. 2.18×10^{-18} J B. 13.13×10^{5} J
C. 8.72×10^{-18} J D. 26.26×10^{5} J

196. **Instruction:** The question given below consists of two statements, an Assertion (A) and a Reason (R).
Indicate your answer from the alternatives below:
Assertion (A): A delta is formed at the junction of a river and a sea by the precipitation of clay particles.
Reason (R): The river water and the sea undergo a chemical reaction to form delta.
In the context of the two statements, which one of the following is correct?
A. Both (A) and (R) are true and (R) is the correct explanation.
B. Both (A) and (R) are true but (R) is not the correct explanation.
C. (A) is true but (R) is false.
D. (A) is false but (R) are true.

197. What is the volume of the solution formed by mixing 50 mL ethyl alcohol in 950 mL water?
A. equal to 1.0 L
B. more than 1.0 L
C. less than 1.0 L
D. Depends on room temperature

198. Which one of the following pair is correctly matched?

List – I (Law of Chemical Combination)		**List – II (Name of Discoverer)**
I.	Law of Constant	a. Lavoisier
II.	Law of Reciprocal Proportion	b. Joseph Proust
III.	Law Indestructibility of Matter	c. C. John Dalton
IV.	Law of Multiple Proportion	d. Gay Lussac
		e. Richter

Code:

	I	II	III	IV
A.	a	c	b	d
B.	d	b	c	e
C.	b	e	a	c
D.	c	a	d	b

199. Which one of the following sets of quantum numbers is **not** possible?
A. $n = 3, l = 3, m_l = -2, m_s = +\frac{1}{2}$
B. $n = 2, l = 1, m_l = +1, m_s = -\frac{1}{2}$
C. $n = 1, l = 0, m_l = 0, m_s = +\frac{1}{2}$
D. $n = 4, l = 1, m_l = -1, m_s = -\frac{1}{2}$

200. What are the numbers of angular nodes and radial nodes for 4*d*-orbitals respectively?
A. 2 and 1 B. 1 and 2
C. 2 and 3 D. 3 and 2