RAVI MATHS TUITION CENTER , CHENNAI- 82. WHATSAPP - 8056206308
10th QUARTERLY EXAM IMPORTANT

10th Standard

Science

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73 x 2 = 146

1) Define inertia. Give its classification.

2) Classify the types of force based on their application.

3) Differentiate mass and weight.

4) Define moment of a couple.

5) State the principle of moments.

6) State Newton's second law.

7) How does an astronaut float in a space shuttle?

8) State Snell's law.

9) Define dispersion of light.

10) State Rayleigh's law of scattering.

11) Differentiate convex lens and concave lens.

12) What are the causes of 'Myopia'?

13) Why does the sky appear in blue colour?

14) Why are traffic signals red in colour?

15) Define one calorie.

16) State Boyle's law

17) State-the law of volume

18) Distinguish between ideal gas and real gas.

19) What is co-efficient of apparant expansion?

20) Define the unit of current.

21) What happens to the resistance, as the conductor is made thicker?

22) Why is tungsten metal used in bulbs, but not in fuse wires?

23) Name any two devices, which are working on the heating effect of the electric current.

24) Define: Relative atomic mass.

25) Write the different types of isotopes of oxygen and its percentage abundance.

26) Define: Atomicity

27) Give any two examples for heterodiatomic molecules.

28) What is rust? Give the equation for formation of rust.

29) State two conditions necessary for rusting of iron.

30) Define the term: Solution.

31) What is mean by binary solution?

32) Give an example each
    i) gas in liquid
    ii) solid in liquid
    iii) solid in solid
    iv) gas in gas

33) What is aqueous and non-aqueous solution? Give an example.

34) Define Volume percentage

35) Define Hydrated salt.

36) A hot saturated solution of copper sulphate forms crystals as it cools. Why?

37) What is collateral vascular bundle?

38) Where does the carbon that is used in photosynthesis come from?

39) What is the common step in aerobic and anaerobic pathway?

40) Name the phenomenon by which carbohydrates are oxidized to release ethyl alcohol.

41) Give the common name of the Hirudinaria granulosa

42) How does leech respire?

43) Write the dental formula of rabbit.

44) How is diastema formed in rabbit?

45) Which organ acts as suction pump in leech?

46) Why is the teeth of rabbit called heterodont?

47) How does leech suck blood from the host?

48) Name two layered protective covering of human heart.

49) What is the shape of RBC in human blood?

50) Why is the colour of the blood red?

51) Which kind of cells are found in the lymph?

52) Define stimulus.

53) Name the parts of the hind brain.

54) What are the structures involved in the protection of brain?

55) Give an example for conditioned reflexes.

56) Define reflex arc.

57) Which hormone promotes the production of male flowers in Cucurbits?

58) Write the name of a synthetic auxin.

59) Which hormone induces parthenocarpy in tomatoes?

60) Which hormone is secreted during emergency situation in man?

61) Which gland secretes digestive enzymes and hormones?

62) Name the endocrine glands associated with kidneys.

63) If one pollen grain produces two male gametes, how many pollen grains are needed to fertilize 10 ovules?

64) In which part of the flower germination of pollen grains takes place?

65) Mention the function of endosperm

66) Name the hormone responsible for the vigorous contractions of the uterine muscles.

67) What is the need for contraception?

68) Name the part of the human female reproductive system where the following occurs.
   a. Fertilization
   b. Implantation

69) What is a cross in which inheritance of two pairs of contrasting characters are studied?

70) Name the conditions when both the alleles are identical?

71) A garden pea plant produces axial white flowers. Another of the same species produced terminal violet flowers. Identify the dominant trait?

72) What is the name given to the segments of DNA, which are responsible for the inheritance of a particular character?

73) Name the bond which binds the nucleotides in a DNA.

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74) Two bodies have a mass ratio of 3:4 The force applied on the bigger mass produces an acceleration of 12 ms^{-2}. What could be the acceleration of the other body, if the same force acts on it.

75) A mechanic unscrew a nut by applying a force of 140 N with a spanner of length 40 cm. What should be the length of the spanner if a force of 40 N is applied to unscrew the same nut?

76) The ratio of masses of two planets is 2:3 and the ratio of their radii is 4:7. Find the ratio of their accelerations due to gravity.

77) Find the final temperature of a copper rod. Whose area of cross section changes from 10 m^2 to 11 m^2 due to heating. The copper rod is initially kept at 90 K. (Coefficient of superficial expansion is 0.0021 /K)

78) Calculate the coefficient of cubical expansion of a zinc bar. Whose volume is increased 0.25 m^3 from 0.3 m^3 due to the change in its temperature of 50 K.

79) Define electric potential and potential difference.

80) What is the role of the earth wire in domestic circuits?

81) State Ohm's law.

82) Distinguish between the resistivity and conductivity of a conductor.

83) What connection is used in domestic appliances and why?

84) A piece of wire having a resistance R is cut into five equal parts.
   a) How will the resistance of each part of the wire change compared with the original resistance?
   b) If the five parts of the wire are placed in parallel, how will the resistance of the combination change?
   c) What will be ratio of the effective resistance in series connection to that of the parallel connection?

85) Calculate the number of water molecule present in one drop of water which weighs 0.18 g.

86) Give the salient features of "Modern atomic theory".

87) Derive the relationship between Relative molecular mass and Vapour density.

88) Calculate the % of each element in calcium carbonate. (Atomic mass: C-12, O-16, Ca -40).

89) Calculate the % of oxygen in $Al_2(SO_4)_3$. (Atomic mass: Al-2, O-16, S -32).

90) Calculate the % relative abundance of B -10 and B -11, if its average atomic mass is 10.804 amu.

91) a) State the reason for addition of caustic alkali to bauxite ore during purification of bauxite.
   b) Along with cryolite and alumina, another substance is added to the electrolyte mixture. Name the substance and give one reason for the addition

92) The electronic configuration of metal A is 2,8,18,1.
   The metal A when exposed to air and moisture forms B a green layered compound. A with con. H_2SO_4 forms C and D along with water. D is a gaseous compound. Find A,B,C and D.

93) Explain smelting process.

94) Write notes on
   i) saturated solution
   ii) unsaturated solution

95) Write notes on various factors affecting solubility

96) a) What happens when $MgSO_4.7H_2O$ is heated? Write the appropriate equation
   b) Define solubility

97) In what way hygroscopic substances differ from deliquescent substances.

98) A solution is prepared by dissolving 45 g of sugar in 180 g of water. Calculate the mass percentage of solute.

99) Give an account on vascular bundle of dicot stem.

100) Write a short note on mesophyll.

101) Draw and label the structure of oxysomes.

102) Name the three basic tissues system in flowering plants.

103) What is photosynthesis and where in a cell does it occur?

104) What is respiratory quotient?

105) Why are the rings of cartilages found in trachea of rabbit?

106) List out the parasitic adaptations in leech.

107) Leeches do not have secretion of digestive juices and enzymes -Why?

108) How is the digestive system of rabbit suited for herbivorous mode of feeding?

109) What causes the opening and closing of guard cells of stomata during transpiration?

110) What is cohesion?

111) Describe the structure and working of the human heart.

112) Why is the circulation in man referred to as double circulation?

113) What are heart sounds? How are they produced?

114) What is the importance of valves in the heart?

115) Who discovered Rh factor? Why was it named so?

116) Why is the Sinoatrial node called the pacemaker of heart?

117) The complete events of cardiac cycle last for 0.8 sec. What is the timing for each event?

118) Voluntary and involuntary actions.

119) Medullated and non-medullated nerve fibre.

120) What are synthetic auxins? Give examples.

121) What is bolting? How can it be induced artificially?

122) Bring out any two physiological activities of abscisic acid.

123) What are chemical messengers?

124) Write the differences between endocrine and exocrine gland.

125) What is the role of parathormone?

126) Why are thyroid hormones refered as personality hormone?

127) What will happen if you cut planaria into small fragments?

128) Why is vegetative propagation practiced for growing some type of plants?

129) Define triple fusion.

130) Write the characteristics of insect pollinated flowers.

131) How does developing embryo gets its nourishment inside the mother's body?

132) Identify the parts A, B, C and D

133) Write the events involved in the sexual reproduction of a flowering plant.
   a. Discuss the first event and write the types.
   b. Mention the advantages and the disadvantages of that event

134) Why are the human testes located outside the abdominal cavity? Name the pouch in which they are present .

135) Luteal phase of the menstrual cycle is also called the secretory phase. Give reason.

136) Why are family planning methods not adopted by all the people of our country?

137) Why did Mendel select pea plant for his experiments?

138) What do you understand by the term phenotype and genotype?

139) What are allosomes?

140) What are Okazaki fragments?

141) Explain the structure of a chromosome

142) Under which conditions does the law of independent assortment hold good and why?

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143) What are the types of inertia? Give an example for each type.

144) State Newton's laws of motion?

145) Deduce the equation of a force using Newton's second law of motion.

146) State and prove the law of conservation of linear momentum.

147) Describe rocket propulsion.

148) State the universal law of gravitation and derive its mathematical expression.

149) Give the applications of universal law gravitation.

150) An object is placed at a distance 20cm from a convex lens of focal length 10cm. Find the image distance and nature of the image.

151) An object of height 3cm is placed at 10cm from a concave lens of focal length 15cm. Find the size of the image.

152) While doing an experiment for the determination of focal length of a convex lens, Raja Suddenly dropped the lens. It got broken into two halves along the axis. If he continues his experiment with the same lens,
(a) can he get the image?
(b) Is there any change in the focal length?

153) The eyes of the nocturnal birds like owl are having a large cornea and a large pupil. How does it help them?

154) List any five properties of light.

155) Explain the rules for obtaining images formed by a convex lens with the help of ray diagram.

156) Differentiate the eye defects: Myopia and Hypermetropia.

157) Explain the construction and working of a 'Compound Microscope'.

158) Derive the ideal gas equation.

159) Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.

160) With the help of a circuit diagram derive the formula for the resultant resistance of three resistances connected:
a) in series and
b) in parallel.

161) a) What is meant by electric current?
b) Name and define its unit.
c) Which instrument is used to measure the electric current? How should it be connected in a circuit?

162) a) State Joule's law of heating.
b) An alloy of nickel and chromium is used as the heating element. Why?
c) How does a fuse wire protect electrical appliances?

163) Explain about domestic electric circuits. (circuit diagram not required)

164) a) What are the advantages of LED TV over the normal TV?
b) List the merits of LED bulb.

165) 1. Calcium carbonate is decomposed on heating in the following reaction
$CaCO_3 \rightarrow CaO + CO_2$
i. How many moles of Calcium carbonate are involved in this reaction?
ii. Calculate the gram molecular mass of calcium carbonate involved in this reaction.
iii. How many moles of CO_2 are there in this equation?

166) Metal A belongs to period 3 and group 13. A in red hot condition reacts with steam to form B. A with strong alkali forms C. Find A,B and C with reactions

167) Name the acid that renders aluminium passive. Why?

168) a) Identify the bond between H and F in HF molecule.
   b) What property forms the basis of identification?
   c) How does the property vary in periods and in groups?

169) Vinu dissolves 50 g of sugar in 250 ml of hot water, Sarath dissolves 50 g of same sugar in 250 ml of cold water. Who will get faster dissolution of sugar? and Why?

170) 'A' is a blue coloured crystaline salt. On heating it loses blue colour and to give 'B'. When water is added, 'B' gives back to 'A'. Identify A and B, write the equation.

171) Will the cool drinks give more fizz at top of the hills or at the foot? Explain.

172) Differentiate the following
   a) Monocot root and Dicot root
   b) Aerobic and Anaerobic respiration

173) Describe and name three stages of cellular respiration that aerobic organisms use to obtain energy from glucose.

174) How does the light dependent reaction differ from the light independent reaction? What are the end product and reactants in each? Where does each reaction occur within the chloroplast?

175) The reactions of photosynthesis make up a biochemical pathway.
   A) What are the end and products of light and dark reactions of photosynthesis.
   B) Explain how the biochemical pathway of photosynthesis recycles many of its own reactions and identify the recycled reactants.

176) Where do the light dependent reaction and the Calvin cycle occur in the chloroplast.

177) How is the circulatory system designed in leech to compensate the heart structure?

178) How does locomotion take place in leech?

179) Explain the male reproductive system of rabbit with a labelled diagram.

180) Arjun is studying in tenth standard. He was down with fever and went to meet the doctor. As he went to the clinic he saw a patient undergoing treatment for severe leech bite. Being curious, Arjun asked the doctor why leech bite was not felt as soon as it attaches to the skin ? What would have been the reply given by the doctor?

181) Shylesh has some pet animals at his home. He has few rabbits too, one day while feeding them he observed something different with the teeth. He asked his grandfather, why is it so? What would have been the explanation of his grandfather?

182) How do plants absorb water? Explain.

183) What is Transpiration? Give the importance of transpiration.

184) Why are leucocytes classified as granulocytes and agranulocytes? Name each cell and mention its functions.

185) Differentiate between systole and diastole. Explain the conduction of heart beat.

186) Enumerate the functions of blood.

187) When any dry plant material is kept in water, they swell up. Name and define the phenomenon involved in this change.

188) Why are the walls of the left ventricle thicker than the other chambers of the heart?

189) Doctors use stethoscope to hear the sound of the heart. Why?

190) How does the pulmonary artery and pulmonary vein differ in their function when compared to a normal artery and vein?

191) Transpiration is a necessary evil in plants. Explain.

192) With a neat labelled diagram explain the structure of a neuron.

193) Illustrate the structure and functions of brain.

194) What will you do if someone pricks your hand with a needle? Elucidate the pathway of response with a neat labelled diagram.

195) Describe the structure of spinal cord.

196) How nerve impulses are transferred from one neuron to next neuron?

197) Classify neurons based on its structure.

198) 'A' is a cylindrical structure that begins from the lower end of medulla and extend downwards. It is enclosed in bony cage 'B' and covered by membranes 'C'. As many as 'D' pairs of nerves arise from the structure 'A'.
(i) What is A?
(ii) Name (a) bony cage 'B' and (b) membranes 'C'
(iii) How much is D?

199) Our body contains a large number of cells 'L' which are the longest cells in the body. L has long and short branch called as 'M' and 'N' respectively. There is a gap 'O' between two 'L' cells, through which nerve impulse transfer by release of chemical substance 'P'.
(i) Name the cells L
(ii) What are M and N?
(iii) What is the gap O?
(iv) Name the chemical substance P

200) (a) Name the gaseous plant hormone. Describe its three different actions in plants.
(b) Which hormone is known as stress hormone in plants ? Why?

201) Describe an experiment which demonstrates that growth stimulating hormone is produced at the tip of coleoptile.

202) Write the physiological effects of gibberellins.

203) Where are estrogens produced? What is the role of estrogens in the human body?

204) What are the conditions which occur due to lack of ADH and insulin? How are the conditions different from one another?

205) What would be expected to happen if
   a. Gibberellin is applied to rice seedlings.
   b. A rotten fruit gets mixed with unripe fruits.
   c. When cytokinin is not added to culture medium

206) A plant hormone was first discovered in Japan when rice plants were suffering from Bakanae disease caused by Gibberella fujikoroi. Based on this information answer the following questions:
   a. Identify the hormone involved in this process.
   b. Which property of this hormone causes the disease?
   c. Give two functions of this hormone.

207) Senthil has high blood pressure, protruded eyeball and an increased body temperature. Name the endocrine gland involved and hormone secretion responsible for this condition.

208) Sanjay is sitting in the exam hall. Before the start of the exam, he sweats a lot, with increased rate of heart beat. Why does this condition occur?

209) Susan's father feels very tired and frequently urinates. After clinical diagnosis he was advised to take an injection daily to maintain his blood glucose level. What would be the possible cause for this? Suggest preventive measures.

210) With a neat labelled diagram describe the parts of a typical angiospermic ovule.

211) What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

212) In angiosperms the pollen germinates to produce pollen tube that carries two gametes. What is the purpose of carrying two gametes when single gamete can fertilize the egg?

213) Why menstrual cycle does not take place before puberty and during pregnancy?

214) Read the following passage and answer the questions that follow Rahini and her parents were watching a television programme. An advertisement flashed on the screen which was promoting use of sanitary napkins. Rahini's parents suddenly changed the channel, but she objected to her parents and explained the need and importance of such advertisement.

a) What is first menstruation called? When does it occur?

b) List out the napkin hygiene measures taken during menstruation?

c) Do you think that Rahini's objection towards her parents was correct? If so, Why?

215) Explain with an example the inheritance of dihybrid cross. How is it different from monohybrid cross?

216) How is the structure of DNA organised? What is the biological significance of DNA?

217) The sex of the new born child is a matter of chance and neither of the parents may be considered responsible for it. What would be the possible fusion of gametes to determine the sex of the child?

218) Flowers of the garden pea are bisexual and self-pollinated. Therefore, it is difficult to perform hybridization experiment by crossing a particular pistil with the specific pollen grains. How Mendel made it possible in his monohybrid and dihybrid crosses?

219) Pure-bred tall pea plants are first crossed with pure-bred dwarf pea plants. The pea plants obtained in F_1 generation are then cross-bred to produce F_2 generation of pea plants.

a. What do the plants of F_1 generation look like?

b. What is the ratio of tall plants to dwarf plants in F_2 generation?

c. Which type of plants were missing in F_1 generation but reappeared in F_2 generation?

220) Kavitha gave birth to a female baby. Her family members say that she can give birth to only female babies because of her family history. Is the statement given by her family members true. Justify your answer.

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221) Calculate the velocity of a moving body of mass 5 kg whose linear momentum is 2.5 kg m s^{-1}.

222) A door is pushed, at a point whose distance from the hinges is 90 cm, with a force of 40 N. Calculate the moment of the force about the hinges.

223) At what height from the centre of the Earth the acceleration due to gravity will be $1/4$th of its value as at the Earth.

224) Light rays travel from vacuum into a glass whose refractive index is 1.5. If the angle of incidence is 30°, calculate the angle of refraction inside the glass.

225) A beam of light passing through a diverging lens of focal length 0.3m appear to be focused at a distance 0.2m behind the lens. Find the position of the object.

226) A person with myopia can see objects placed at a distance of 4m. If he wants to see objects at a distance of 20m, what should be the focal length and

power of the concave lens he must wear?

227) For a person with hypermeteropia, the near point has moved to 1.5m. Calculate the focal length of the correction lens in order to make his eyes normal.

228) A container whose capacity is 70 ml is filled with a liquid up to 50 ml. Then, the liquid in the container is heated. Initially, the level of the liquid falls from 50 ml to 48.5 ml. Then we heat more, the level of the liquid rises to 51.2 ml. Find the apparent and real expansion.

229) Keeping the temperature as constant, a gas is compressed four times of its initial pressure. The volume of gas in the container changing from 20cc (V_1 cc) to V_2 cc. Find the final volume V_2.

230) Two bulbs are having the ratings as 60 W, 220 V and 40 W, 220 V respectively. Which one has a greater resistance?

231) Calculate the current and the resistance of a 100 W, 200 V electric bulb in an electric circuit.

232) In the circuit diagram given below, three resistors R_1, R_2 and R_3 of 5 Ω, 10 Ω and 20 Ω respectively are connected as shown. Calculate:
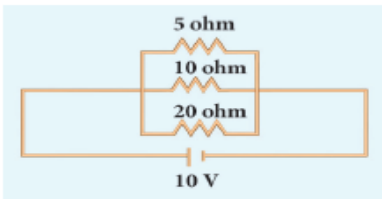
A) Current through each resistor
B) Total current in the circuit
C) Total resistance in the circuit

233) Three resistors of 1 Ω, 2 Ω and 4 Ω are connected in parallel in a circuit. If a 1 Ω resistor draws a current of 1 A, find the current through the other two resistors.

234) Calculation of molar mass
Calculate the gram molar mass of the following.
1) H_2O
2) CO_2
3) $Ca_3 (PO_4)_2$

235) Calculation based on number of moles from mass and volume
1) Calculate the number of moles in 46 g of sodium?
2) 5.6 litre of oxygen at S.T.P
3) Calculate the number of moles of a sample that contains 12.046×10^{23} atoms of iron?

236) Calculation of mass from mole
Calculate the mass of the following
1) 0.3 mole of aluminium (Atomic mass of Al = 27)

2) 2.24 litre of SO_2 gas at S.T.P

3) 1.51×10^{23} molecules of water

4) 5×10^{23} molecules of glucose?

237) Calculation based on number of atoms/molecules

　　1) Calculate the number of molecules in 11.2 litre of CO_2 at S.T.P

　　2) Calculate the number of atoms present in 1 gram of gold (Atomic mass of Au = 198)

　　3) Calculate the number of molecules in 54 gm of H_2O?

　　4) Calculate the number of atoms of oxygen and carbon in 5 moles of CO_2.

238) Calculation based on molar volume

　　Calculate the volume occupied by:

　　1) 2.5 mole of CO_2 at S.T.P

　　2) 12.046×10^{23} of ammonia gas molecules

　　3) 14 g nitrogen gas

239) Calculation based on % composition

　　Calculate % of S in H_2SO_4

240) Find the mass percentage composition of methane (CH_4).

241) Relative molecular mass of sulphuric acid (H_2SO_4) is calculated as follows: Sulphuric acid contains 2 atoms of hydrogen, 1 atom of sulphur, and 4 atoms of oxygen.

242) 1.5 g of solute is dissolved in 15 g of water to form a saturated solution at 298K. Find out the solubility of the solute at the temperature.

243) Find the mass of potassium chloride would be needed to form a saturated solution in 60 g of water at 303 K? Given that solubility of the KCl is 37 / 100 g at this temperature.

244) What is the mass of sodium chloride that would be needed to form a saturated solution in 50 g of water at 30°C. Solubility of sodium chloride is 36 g at 30°C?

245) The Solubility of sodium nitrate at 50°C and 30°C is 114 g and 96 g respectively. Find the amount of salt that will be thrown out when a saturated solution of sodium nitrate containing 50 g of water is cooled from 50°C to 30°C?

246) A solution was prepared by dissolving 25 g of sugar in 100 g of water. Calculate the mass percentage of solute.

247) 16 grams of NaOH is dissolved in 100 grams of water at 25°C to form a saturated solution. Find the mass percentage of solute and solvent.

　　(i) Mass of the solute (NaOH) = 16 g

　　(ii) Mass of the solvent H_2O = 100 g

248) Find the amount of urea which is to be dissolved in water to get 500 g of 10 % w / w aqueous solution?

249) A solution is made from 35 ml of Methanol and 65 ml of water. Calculate the volume percentage.

250) Calculate the volume of ethanol in 200 ml solution of 20% v/v aqueous solution of ethanol.

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