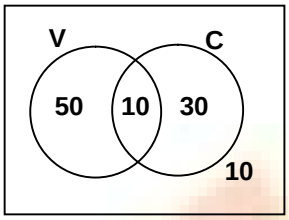
NTSE STAGE - I – 2020 – 2021 - TAMIL NADU

PART – I SAT TEST

SOLUTIONS

101. (4)



n(U) = 100

n(V) = 60

n(C) = 40

n(VUC) = 100 – 10 = 90

$\therefore$ n(V$\cap$C) = n(V) + n(C) – n(VUC)

= 60 + 40 – 90

= 10 $\therefore$ only chocolate = 30

102. (3)

$x^2 + y^2 + z^2 = 29$

$xy + yz + zx = 26$

$x^2 + y^2 + z^2 = 2xy + 2yz + 2zx$

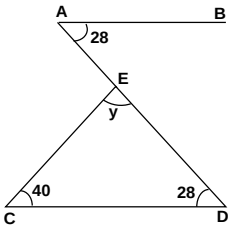
$= 29 + 2 \times 26$

= 81

$\therefore (x + y + z)^2 = 81$

$x + y + z = \pm 9$

103. (3)

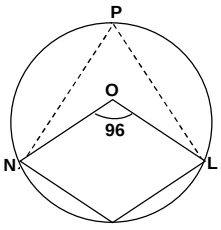


$\angle D = 28°$(AIA)

40 + 28 + y = 180 (ASP)

y = 112

104. (2)



$\angle NPL = \frac{1}{2} \times 96$

= 48

$\angle M = 180 - P$

= 132

105. (4)

$$\frac{\sin 35}{\cos 55} - \frac{\tan 12}{\cot 78} - \frac{\sin 18}{\cos 72}$$

$= 1 - 1 - 1 = -1$

106. (1)

$\bar{x} = 58 - 5 = 53$

107. (1)

All real number are either rational or irrational

108. (1)

$$\frac{6x^2 + 5x - 6}{3x - 2}$$

$= 2x + 3$

109. (3)

$x^3 - y^3 = (x - y)\left(x^2 + xy + y^2\right)$

Given $\frac{x}{y} + \frac{y}{x} = -1$

$\Rightarrow x^2 + y^2 = -xy$

$\Rightarrow x^2 + xy + y^2 = 0$

Multiple (x - y) on both side,

$\left(x - y\right)\left(x^2 + xy + y^2\right) = (x - y)0$

$\Rightarrow x^3 - y^3 = 0$

110. (2)

$6x = 180$

$x = 30°$

111. (1)

$6a^2 = 96$

$\therefore a^2 = 16 \Rightarrow a = 4$

$a^3 = 64$

112. (3)

No. of vowels = 5

Total = 9

$\therefore P = \frac{5}{9}$

113. (1)

$6x^2y^2$ and $8x^4y^4$

LCM = $24x^4y^4$

114. (1)

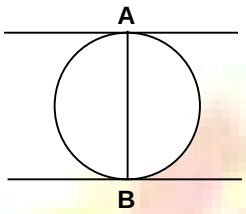
Parallel tangent $\therefore$ end points of diameter

$\therefore$ AB = diameter

$\pi r^2 = 25\pi$

$\therefore r = 5$

$\therefore$ AB = 10



115. (4)

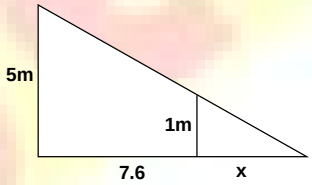
In 4 sec, distance = 7.6 m

$\frac{5}{1} = \frac{7.6 + x}{x}$

5x = 7.6 + x

4x = 7.6

x = 190 cm



116. (3)

$72 = 2^3 \times 3^2$

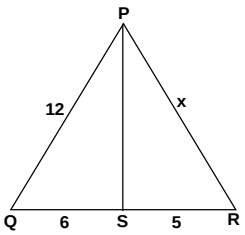
$\therefore (a,b),(2,3) \text{ or } (3,2)$

117. (2)

Angle bisector theorem

$\frac{PQ}{PR} = \frac{QS}{RS}$

$\frac{12}{x} = \frac{6}{5} \Rightarrow x = 10$



118. (1)

Dist = $\sqrt{(4-2)^2 + (3-1)^2}$

$= \sqrt{6^2 + 2^2}$

$= \sqrt{40} = 2\sqrt{10}$

119. (1)

$\cos\theta \times \sec\theta + \sin\theta \times \operatorname{cosec}\theta$

= 1 + 1 = 2

120. (3)

$2\pi r = 220 \quad \therefore r = 35$

$\text{Vol} = \frac{1}{3}\pi r^2 h = 26950$

121. (3)

$\alpha = \frac{R_T - R_O}{R_O(T - T_O)} = \frac{\cancel{\Omega}}{\cancel{\Omega}\ ^\circ C.}$

= /°C.

122. (2)

$P = \frac{F_\perp}{A} = \frac{400}{80 \times 10^{-4}}$

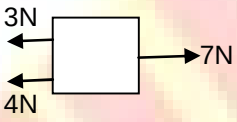
$= 5 \times 10^4 Pa$

123. (2) Energy = work done (w) = vq

$w = 1.5 \times 0.5$

$= 0.75J$

124. (1)



Horizontally forces are balanced

$F_{net} = 5 - 4 = 1N$ along North

The net force in the north direction

125. (3)

a) Magnetic lines of force never intersect

d) Magnetic lines of force are closed continuous carries extending to the body of magnet.

a, d statements are correct

126. (3)

The distance travelled by sound in the second is called velocity of sound.

127. (1)

P = - 2.0D

$$F = \frac{1}{P} = \frac{1}{-2} = -0.5m$$

= - 50cm

So, near sightedness,. 50cm

128. (4)

Sound Navigation and Range (SONAR)

Works on the reflection of sound.

129. (3)

$1 \times 1000watt \times 2hrs \times 30 = 60000whr$

$5 \times 60watts \times 10hr \times 30 = 90000whr$

Total energy = 150 kw hr

Total price = $150 \times 5 = 750Rs$

130. (3)

DC generator works on the principle of Faradays laws of electromegneitc induction.

131. (1)

A) Highest refraction → Diamond

B) Lowest refraction → Ice

C) Head lights of a car → Concave mirror

D) Side near view mirror → convex mirror

132. (1)

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$v = \frac{uf}{u-f}$$

$$m = \frac{-v}{u}\left[\frac{\frac{-uf}{u-f}}{u}\right]$$

$$m = \frac{-f}{u-f}$$

133. (3)

The lactometer stem is more sinking in milk A compared to sample milk B.

So,

→ Water content in A is less than B

→ Density of sample A is less than density of the sample B.

134. (3)

(a) $HCl \longrightarrow H^{+} + Cl^{\ominus}$

(b) $HCOOH \longrightarrow HCOO^{-} + H^{\oplus}$

(c) $CH_3OH \longrightarrow CH_3OH$

(d) $CH_3COOH \longrightarrow CH_3COO^{-} + H^{\oplus}$

Here alcohol is soluble in water but will not dissociate.

135. (4)

Particles like proton, electron and Neutron are fundamental while few more includes (meson, Neutrino, Positron etc.)

Answer is proton

136. (2)

The element 'X' has 7 electron is 'M' shell.

K = 2

L = 8

M = 7

Atomic number = 17

Here (a) period – 3 element

(b) Valency = 1

Valency = 8 = valence electron

(c) belong's to 17^{th} group

(B & C) are wrong

137. (4)

AB + CD → AD + CB

138. (3)

Yes hydrogen is under debate

shows similarity with group 1 & group 17 element

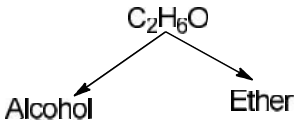
(B) Wrong. Hydrogen is in top

139. (1)

The tendency of atom to have eight electrons in the valence shell is known as 'octet rule or 'Rule of eight" by Kossel and Lewis

140. (2)

Molecular formula



141. (1)

group 11 $\Rightarrow$ are Transition element.

Halogen family is 17^{th} group

142. (2)

Ionic bond if electro negativity different is greater than 1.7

Covalent bond if electronegative different is less than 1.7

Hence 50% - 50% Ionic & Covalent

143. (3)

Here HNO_3 is most stronger oxidizing agent.

HNO_3 reacts on the surface of iron and passiveness the surface.

144. (1)

The P^H of rain water is approximately 7

145. (4)

Root word for 4 carbon is

146. (4)

Metalloids in periodic table are Arsenic, Silicon, Boron

147. (1)

Fact

148. (1)

Rhizobium increases uptake of Nitrogen not Phosphorous.

149. (3)
Cambium is the component of ground tissue.

150. (2)
Epithelium is involved in exchange of gases, excretion and absorption and secretion of chemicals but doesn't allow free movement.

151. (3)
Recessive factors never appear in F1 generation since they are masked by Dominant factors and Gregor Mendel worked on Pea plant.

152. (3)
Meristematic cells are tightly packed and do not have intercellular spaces.

153. (4)
Skin, liver cells have regenerative capacity and RBC are replaced for every 120 days. Eye lens cells do not regenerate.

154. (3)
Fact

155. (3)
Microscope was invented by Zacharias Janssen.

156. (4)
Eosinophil, Monocyte and Neutrophil are WBCs and Myofibril is muscle fibre.

157. (2)
Diverticula belongs to digestive system and remaining are body wall tissues.

158. (1)
Fact.

159. (2)
Fact

160. (2)
RBCs doesn't have nucleus and cell organelles.

161. (1)
Balaji Vishwanath was first peshwa appointed by Shahu in 1713.

162. (4)
Genghis Khan was the one who united all tribles and farmed a military

163. (1)
After the Battle of Plassey British awarded Mir Zafar as Nawab

164. (4)
estate general was a political body consist of 3 tiers in France.

165. (2)
Seven years war was fought between France and England in 1756 ended with treaty of Paris – in 1763.

166. (1)
Corvee $\rightarrow$ was a free labour system it was imposed by a state for the purposes of Public works.

167. (4)
Portuges were the one who started Navigation school to find New sea routes to Asia
Early name ? New York was New Armster-dom changed by British

168. (3)
Vietnam National Party – 1939
Fascist – 1979
The union of South Africa – 1910
French communist party – 1920

169. (3)
Andrew Jackson said Salter as father of American industrial revolution

170. (1)
Ethiopia was ruled by Menelik

171. (3)
Hundred days of reform – 1898
Russian Revolution – 1917
First opioum war – 1832
Cines revolution – 1911

172. (2)
Volcanic region does not help in generating tidal energy.

173. (3)
The extreme wind which blows in Southern himosphere known as westerly

174. (3)
Bhuvan – Geo-portal by is sRO comprising of Geo Capital Data

175. (3)
Pulicat lake is in Tamilnadu North cost Border district Tiruvallur

176. (1)
Tehri – Bhagirathi
Hirakud – Mahanadi
Nagarjun Sagar – Krishna
Indira Gandhi – canal – Sutlej

177. (4)
Kachch is not recognized by UNESCO

178. (4)
ICAR – founded in 1953.

179. (4)
Nagaland is not sharing Border with Bangladesh. Assam Tripura Meghalaya Do share border.

180. (3)
Print media which is cheap and easy Accessible and powerful

181. (2)
Gaja was named by Sri lanka its originated their – in 2018.

182. (3)
mt. Helens – USA @mt.kilimanjaro - Tanzania
@ mt.Fuji – Japan
@ mauna Loa – Hawaii

183. (1)
office memorandam is a special order of government issued for day to day administration

184. (3)
Institutional revolutionary party won until 1930.

185. (3)
Govt of India Act issued in 1935 by British

186. (2)
Both statements induvidualy correct but R does not explains

187. (4)
Bihar elections held in 2020.

188. (3)
Panchayat elections are conducted by state election commission

189. (4)
According Chanakya Janapada was the basic unit of administration in 3rd century

190. (2)
Liberty equality Fraternity are & three powerful words given by French revolution to the World.

191. (4)
Cabinet is a unofficial body of senior misters

192. (1)
Maharashtra is the one among seven states with Dual house

193. (2)
Indirect election $\rightarrow$ people will not cost vote directly

194. (3)
A is true but R is false interest rates are high in informal sector

195. (1)

Head count Ratio

196. (1)

Per capita income

197. (2)

Bank postal education transport

198. (4)

Globalisation increased foreign investment

199. (1)

Entrepreneur

200. (1)

Marco Polo who carry the paper currency to Europe by China and Japan.