

(SAT Solution)

91. (1)

Sol. $\Delta.P.E = mgh$

$$= 20 \times 9.8 \times \frac{50}{100}$$

$$= 98J$$

92. (1)

Sol. In general material used is copper

93. (3)

Sol. $\Delta Q = mc\Delta t$

$$1cal = 1g \times 0.093 \times \Delta t$$

$$\Delta t = \frac{1}{0.093} \approx 10$$

94. (4)

Sol. $f =$ no of oscilation in one sec.

$$f = \frac{20}{2.5} = 8Hz$$

95. (1)

Sol. 1hp = 746 watt.

$$\Rightarrow 1hp = \frac{746 \times 1000}{1000} watt.$$

$$\Rightarrow 1k watt = \frac{1000}{746} hp = 3.46 hp$$

96. (2)

Sol. fact – based

97. (1)

Sol. The solution since becomes colourless since Zn has replaced Cu from $CuSO_4$ and thus is a substitution Reaction.

98. (3)

Sol. Conceptual

99. (4)

Sol. Conceptual

100. (1)

Sol. Launch by Russia on 4th oct. 1957

101. (4)

Sol. it is the 15th saturn's non satellite.

102. (2)

Sol. $\frac{-v}{u} = -5 \Rightarrow v = 5u$

$$\frac{1}{5u} + \frac{1}{u} = \frac{1}{-10}$$

$$u = \frac{-60}{5} = -12cm$$

103. (1)

Sol. International unit of atomic weight is carbon – 12 isotope.

104. (4)

Sol. All the isotopes of U-234, U-235 and U-238 are radioactive .

U – 234 has a half life of 2.45×10^5 yrs

U – 235 has a half life of 7.04×10^8 yrs

U – 238 has a half life of 4.46×10^9 yrs

105. (1)

Sol. Atomic No – 19 No. of electrons = 19

 No. of protons = 19

Mass No – 39

No. of neutrons = Mass No – Atomic No

$$= 39 - 19$$

$$= 20$$

106. (1)

Sol. Mass % of Nitrogen in N_2O_3 is

$$= \frac{28}{76} \times 100$$

$$= 36.84\%$$

107. (3)

Sol. The chloride of the metal M is MCl_3 valency of the metal is 3.

Atomic weight = valency \times Equivalent weight

$$= 3 \times 9$$

$$= 27$$

108. (3)

Sol. Atomic weight = valency \times Equivalent weight

$$\text{Valency} = \frac{\text{At.wt}}{\text{Eq.wt}} = \frac{30}{10} = 3.$$

109. (2)

Sol. According to Dulong and Petit & Law

At. weight \times specific heat 6.4

At. wt = 6.4 / specific heat

$$= \frac{6.4}{0.1}$$

$$= 64$$

110. (1)

Sol. The No. of molecules in 1 mole in any gas is 6.023×10^{23} i.e. Avogadro's no.

111.

Sol. Question in complete

112. (2)

Sol. $MgCO_3 \xrightarrow{\Delta} MgO + CO_2$

84 gm

40 gm

84 gm of $MgCO_3$ on decomposition gives - 40 gm MgO

$$\begin{aligned} 5 \text{ gm of } MgCO_3 \text{ on decomposition gives} &= \frac{40}{84} \times 5 \\ &= 2.38 \text{ gm} \end{aligned}$$

113. (2)

Sol. Valency of Cr in $Cr PO_4$ is 3.

PO_4^{-3} thus Cr will be + 3

114. (1)

Sol. Quinaine (Spelling in wrong)

Quinine, drug obtained from cinchona bark is used chiefly in the treatment of malaria.

115. (3)

Sol. Nocturnal (active at night)

There are many birds that are active nocturnally. Some birds, like owls and nighthawks are predominantly nocturnal.

116. (4)

Sol. The normal core body temperature of healthy, resting adult human being is 37.0 degrees celsius. (37°C)

117. (2)

Sol. Budding is a form of asexual reproduction in which a new individual is produced as an outgrowth (bud) of the parent, held for sometime, later released as an independent identical copy of the parent. Budding is seen in unicellular fungi like 'yeasts' and cnidarians like *Hydra*.

118. (3)

Sol. Species is a genetically closed system because its members do not interbreed with members of other species. It is lowest or basic taxonomic category.

119. (4)

Sol. Micronutrients are those essential elements which are required in quantity of less than 1 milligram/ gram of dry matter. They are eight in number - Fe, Mn, Zn, Cu, Ho, B, Cl and Ni.

120. (2)

Sol. Penciline (wrong spelling)

Penicillin is a group of antibiotics derived from penicillium fungi.

121. (1)

Sol. Cotton is a soft, fluffy staple fiber that grows in a ball or protective capsule, around the seeds of cotton.

122. (1)

Sol. Vessels occur regularly only in angiosperms. Pinus is a coniferous gymnosperm.

123. (2)

Sol. Heparin is used to treat and prevent blood clots in veins, arteries or lungs.

124. (4)

Sol. Phytochrome is a photoreceptor, pigment that flowering plants (Angiosperm) use to detect and absorbs light for regulation of seed germination and flowering.

125. (1)

Sol. Vent (wrong spelling)

Went 1928 collected the growth stimulating substance in agar jelly. He discovered that the hormone travelled basipetally (from tip towards the base.) The growth promoting substance was named by him as 'auxin'.

126. (2)

Sol. The first governor of the Portuguese in India was Francis-de-Almeida (1503 – 1509)

127. (3)

Sol. The battle of Plassi was fought between east India company (Britain) under clive & Sirajjudaullah, the Nawab of Bengal on 23rd June. 1757.

128. (3)
Sol. Rani Laxmi bai is associated with city Jhansi
129. (1)
Sol. Rajaram Mohan Roi founded the Brahmo Samaj on 1828.
130. (2)
Sol. Lord Buddha is also known as 'light of Asia'.
131. (4)
Sol. Gandhi ji wrote the book 'My experiment' with Truth.
132. (1)
Sol. Kabir with other 11 were disciples of Ramananda
133. (1)
Sol. In Lahore session of Dec. 1929, President J.L. Nehru declared the attainment of complete Independence as the ultimate goal by Indian National congress.
134. (2)
Sol. The Cabinet Mission arrived on 24th Mar, 1946 in Indian & published its plan on May 16, 1946.
135. (3)
Sol. Bhagat Singh coined the slogan 'Inquilab Zindabad' & used first time in Assembly Hall.
136. (2)
Sol. Indira Point is the Southern most point in India.
137. (1)
Sol. Gujarat has the longest coast line in India.
138. (3)
Sol. Hirakund Dam is constructed on Mahanadi River
139. (2)
Sol. 'The Vally of flowers' lies in Uttarakhand.
140. (3)
Sol. The minimum rainfall place in India is 'Jaisalmer'.
141. (3)
Sol. Laterite soil is found in Kerala.
142. (2)
Sol. Damador is tributary of river Hngli.
143. (4)
Sol. 'Titan' is the largest moon/ satellite of 'Salun .
144. (3)
Sol. The longest river of the world is 'Nile'
145. (1)
Sol. China has the largest population in the world.
146. (4)
Sol. On first day session on 9th Dec. 1946. Dr. Sachihidanand Sinha was elected President but on 11th Dec, 1946 Dr. Rajendra Prasad was elected President . Dr. Ambedkar was President of Drafting committee.
147. (4)
Sol. Indian Parliament consists of Lok Sabha, Rajya Sabha and President.
148. (1)
Sol. Maximum 2 Anglo-Indians can be nominated to Lok-Sabha
149. (3)

- Sol. Constitution of India was adopted by constituent Assembly on 26th Nov, 1949.
150. (2)
- Sol. The chairman of Planning commission is Prime Minister.
151. (3)
- Sol. The maximum strength of Lok Sabha has been fixed 550.
152. (2)
- Sol. The vacancy of the office of President must be filled up with in 6 months (Art. 62)
153. (1)
- Sol. India is a secular state is encunciated in 'Preamble of the constitution. It was added by 42nd Amendment in 1976.
154. (4)
- Sol. New York has the headquarter of UNO.
155. (3)
- Sol. The first summit of SAARC was held at Dhaka in 7-8 Dec, 1985
156. (3)
- Sol. Economic Planning is a subject of concurrent list.
157. (2)
- Sol. 'Twenty Point Economic Programme' was first launced in year 1975.
158. (1)
- Sol. 'ADHAR' is a programme to provide unique identity to the Indian residents.
159. (2)
- Sol. 12th, 5 year Plan is from 2012 – 2017
160. (4)
- Sol. The standard of living in a country is represented by per Capita income'.
161. 2
- Sol. $\alpha + \beta = 5$
 $\alpha\beta = k$
 $\alpha - \beta = 1$
 $(\alpha - \beta)^2 = 1$
 $(\alpha + \beta)^2 - 4\alpha\beta = 1$
 $25 - 4k = 1$
 $24 = 4k$
 $k = 6$
162. 2
- Sol. $(-2)^2 + 9(-2) + 2b = 0$
 $-29 + 2b = -4$
 $a - b = 2$
 $a + b = 4$
 $a = 3, b = 1$
163. 2
- Sol. $1^3 + 2^3 + \dots + 9^3 = 2025$
 $\Rightarrow (0.11)^3 + (0.22)^3 + \dots + (0.99)^3$
 $\Rightarrow (0.11)^3 [1^3 + 2^3 + \dots + 9^3]$
 $\Rightarrow 0.001331 \times 2025 = 2.695275$
164. 2

Sol. $\tan \theta + \frac{1}{\tan \theta} = 2$

Squaring both sides

$$\tan^2 \theta + \frac{1}{\tan^2 \theta} + 2 = 4$$

$$\tan^2 \theta + \frac{1}{\tan^2 \theta} = 2$$

165. (1)

Sol. $\sec 2A = \operatorname{cosec} (A - 42^\circ)$

$$\operatorname{cosec} (90 - 2A) = \operatorname{cosec} (A - 42^\circ)$$

$$90 - 2A = A - 42$$

$$3A = 132$$

$$A = 44^\circ$$

166. (3)

Sol. $\frac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta} = \frac{1 - \sqrt{3}}{1 + \sqrt{3}}$

$$\frac{1 - \tan \theta}{1 + \tan \theta} = \frac{1 - \sqrt{3}}{1 + \sqrt{3}}$$

By comparison

$$\theta = 60^\circ$$

167. (2)

Sol. $\cot \theta + \operatorname{cosec} \theta = 2$ (1)

$$\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$$

$$\operatorname{cosec} \theta - \cot \theta = \frac{1}{2}$$
(2)

adding (1) & (2)

$$2 \operatorname{cosec} \theta = \frac{5}{2}$$

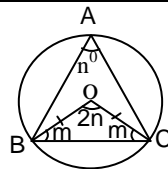
$$\operatorname{cosec} \theta = \frac{5}{4}$$

$$\cos \theta = \frac{3}{5}$$

$$\frac{1 + \cos \theta}{1 - \cos \theta} = \frac{1 + \frac{3}{5}}{1 - \frac{3}{5}} = \frac{8}{2} = 4$$

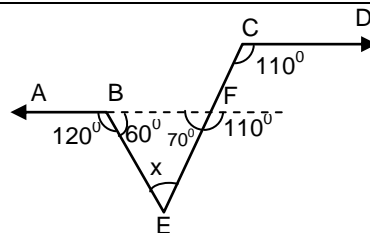
168. (1)

Sol. In $\triangle OBC$
 $m + m + 2n = 180$
 $m + n = 90^\circ$



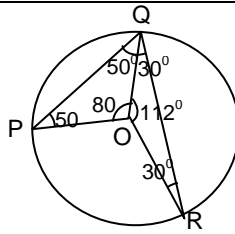
169. (2)

Sol. In $\triangle BEF$
 $60 + x + 70 = 180$
 $x = 50$



170.

Sol. $\angle PQR = 50 + 30$
 $= 80$



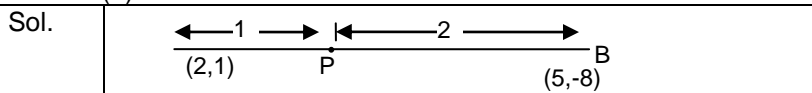
171. (1)

Sol. $\frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$

$$\sum_{i=1}^n (x_i - n\bar{x}) = (x_1 + x_2 + x_3 + \dots + x_n) - n\bar{x}$$

$$= n\bar{x} - n\bar{x} = 0$$

172. (1)



$$P\left(\frac{1 \times 5 + 2 \times 2}{1 + 2}, \frac{1 \times (-8) + 2 \times 1}{1 + 2}\right)$$

$$P(3, -2)$$

P lies on the line $2x + y + k = 0$

$$\therefore 2(3) - 2 + k = 0$$

$$k = -4$$

173.

Sol. Circumference of base of cylinder = $2\pi r = 2\pi \times 5 = 10\pi \text{ cm}$

$$\text{Total round of wire around the cylinder} = \frac{1.2 \times 100}{3/10} = 400$$

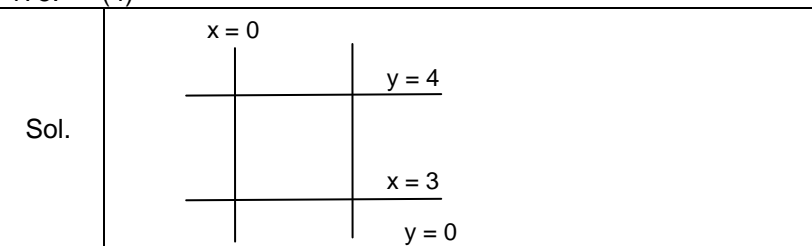
$$\therefore \text{length of wire} = 400 \times 10\pi = 4000\pi \text{ cm}$$

$$4000 \times 3.14 = 12560 \text{ cm or } 125.6 \text{ m}$$

174. (2)

Sol.

175. (4)



176. (4)

Sol. $2^{x-1} + 2^{x+1} = 320$

$$\frac{2^x}{2} + 2^x \times 2 = 320$$

$$2^x \times \left(\frac{1}{2} + 2\right) = 320$$

$$2^x \times \frac{5}{2} = 320$$

$$2^x = 128 = 2^7$$

$$x = 7$$

177.

Sol. $x + \frac{1}{x} = 2$

$$(\sqrt{x})^2 + \left(\frac{1}{\sqrt{x}}\right)^2 + 2\sqrt{x} \cdot \frac{1}{\sqrt{x}} = 2 + 2$$

$$\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 = 4$$

$$\sqrt{x} + \frac{1}{\sqrt{x}} = 2$$

178. (4)
Sol. $(2)^2 - 5(2) + P = 0$
 $P = 6$

179. (4)
Sol. altitude = x cm
Base = (x + 4) cm
hypotenuse = (x + 8) cm
 $(x+8)^2 = (x+4)^2 + x^2$
 $x^2 - 8x - 48 = 0$
 $x^2 - 12x + 4x - 48 = 0$
 $(x-12)(x+4) = 0$
 $x = 12$

180. (2)
Sol. $x^2 + y^2 = (x+y)^2 - 2xy = 8^2 - 2 \times 15 = 34$