
UTTAR PRADESH NTSE STAGE 1 (2020-21)

SAT ANSWER KEY

Physics

101. 4	102. 2	103. 3	104. 2
105. 3	106. 4	107. 1	108. 3
109. 2	110. 2	111. 3	

Chemistry

		114. 3	
112. 2	113. 1	118. 4	115. 2
116. 2	117. 3	122. 2	119. 4
120. 1	121. 4	126. 4	123. 2
124. 3	125. 3		

BIO

127. 1	128. 2	129. 3	130. 4
131. 1	132. 3	133. 2	134. 4
135. 1	136. 2	137. 1	138. 2
139. 2	140. 3		

Social Studies

141. 4	142. 1	143. 3	144. 2
145. 2	146. 2	147. 2	148. 3
149. 4	150. 1	151. 3	152. 4
153. 4	154. 2	155. 3	156. 2
157. 4	158. 3	159. 1	160. 4
161. 2	162. 3	163. 4	164. 1
165. 3	166. 1	167. 1	168. 2
169. 1	170. 2	171. 2	172. 2
173. 3	174. 1	175. 1	176. 1
177. 2	178. 2	179. 1	180. 3

Mathematics

181.2

Sol. $x = 0.\overline{7} = 0.7777\dots$ (i)

$$10x = 7.\overline{7}777\dots \quad \text{(ii)}$$

$$\text{(ii)} - \text{(i)}$$

$$9x = 7$$

$$x = \frac{7}{9}$$

$$\square 2x = \frac{14}{9}$$

$$2x = 1.\overline{5}$$

182.1

Sol. $ax = b, by = c, cz = a$

$$a^{xy} = c \quad \square \quad a^{yz} = a$$

$$xyz = 1$$

183.1

Sol. $\frac{(\sqrt{3}-1)(\sqrt{3}-1)}{(\sqrt{3}+1)(\sqrt{3}-1)} = a + b\sqrt{3}$

$$\frac{3+1-2\sqrt{3}}{3-1} = a + b\sqrt{3}$$

$$\frac{4-2\sqrt{3}}{2} = a + b\sqrt{3}$$

$$2 - \sqrt{3} = a + b\sqrt{3}$$

$$a = 2, b = -1$$

184.4

Sol. $\frac{x^{a+b+c+a}}{x^{2a+2b+2c}} = \frac{x^{2a+2b+2c}}{x^{2a+2b+2c}} = 1$

185.3

Sol. $7^{1+x} + 7^{1-x} = 50$

$$7 \cdot 7^x + \frac{7}{7^x} = 50$$

Let $7^x = y$

$$7y + \frac{7}{y} = 50$$

$$\begin{aligned}
7y^2 + 7 &= 50y \\
7y^2 - 50y + 7 &= 0 \\
7y^2 - 49y - y + 7 &= 0 \\
7y(y-7) - 1(y-7) &= 0 \\
y &= 1/7, 7 \\
\frac{1}{7}x &= \frac{1}{7}x = -1 \\
7^x &= 7 \Rightarrow x = 1
\end{aligned}$$

186. 3

Sol. Let the men salary Rs. 100
 After 10% reduction salary = Rs 90
 Amount increased Rs. 10 to bring it on original salary that is Rs 100.
 Percentage increased = $\frac{10}{90} \times 100 = 11\%$

187. 3

Sol. $\frac{10}{100} \times \frac{20}{100} \times \frac{500}{100} = 1.50$ Rs.

188. 4

Sol. C.P of pen (each) 10 = Rs.
 S.P of pen (each) 11 = Rs.
 So it is clear its profit
 $\text{Profit} = \frac{11}{10} - \frac{10}{11} = \frac{21}{110}$ Rs.
 so now profit% = $\frac{21}{110} \times 100$
 $\frac{21}{110} \times 100 = 21\%$
 $\frac{21}{10} \times 100 = 210\%$

189. 4

Sol. $\frac{11}{3} \times \frac{11}{4} = x \times \frac{11}{3} - \frac{11}{4}$
 $\frac{71}{12} = x \times \frac{11}{3} - \frac{11}{4}$

190. 3

Sol. Let B's income = Rs. 100

A's income = 100 + 20 = 120 Rs.

It is clear that if A's income is Rs. 120, B's income is 100 Rs. which is less than Rs. 20.

B's income less by $\frac{20}{120} = \frac{1}{6}$

$$\frac{100}{6} = 16\frac{2}{3}\%$$

191. 1

Sol. 52 – complete weeks

Two days can be Monday Tuesday, Tuesday Wednesday, Wednesday Thursday, Thursday Friday, Friday Saturday, Saturday Sunday, Sunday Monday.

F sat Sat S, SM

Total case = 7, fordable case = 2

Prob = 2/7

192. 3

Sol. $2\sin^2\theta - \cos^2\theta = 2\sin^2\theta - (1 - \sin^2\theta) = 3\sin^2\theta - 1$

Min value of $\sin^2\theta = 0$

∴ min value of $\frac{3\sin^2\theta - 1}{2} = -\frac{1}{2}$

193. 2

Sol. It following a particular pattern

$$\frac{103 - 1}{111} = \text{Quotient} = 9, \frac{106 - 1}{111} = 9009$$

$$\text{similarly } \frac{1012 - 1}{111} = 9009009009$$

194. 4

Sol. $\log_3 x + 4 = \log_3 729$

$$\begin{aligned} 3^{x+4} &= 3^6 \\ x + 4 &= 6 \Rightarrow x = 2 \end{aligned}$$

195. 1

Sol. We all known that

$$\frac{M_1 D_1 M_2 D_2}{W_1} = \frac{222}{W_2}$$
$$\frac{p_1 p_2 p_3 p_4 p_5 p_6}{p} = \frac{q_1 q_2 q_3 q_4 q_5 q_6}{w_2}$$

$$q^3 w^2 = \frac{p^2}{p^2}$$

196. 4

Sol. Using factor theorem,

Put $x = -1$ in the equation

$$(-1)^3 + 2(-1)^2 + k = 0$$

$$-1 + 2 + k = 0$$

$$k = 1$$

197. 2

Sol. If original radius r
then volume of cylinder $V = \pi r^2 h$

New radius = $1.1r$

New volume = $\pi (1.1r)^2 h$

$$= 1.21 \pi r^2 h$$

So increase in height $\frac{1.21 - 1}{1} \times 100\%$

$$= 17.36\%$$

198. 1

Sol. Square on both side

$$x+1+x-1-2x^2-1=1$$

$$2x-1=2x^2-1$$

again square

$$4x^2 + 1 - 4x = 4(x^2 - 1)$$

$$4x^2 + 1 - 4x = 4x^2 - 4$$

$$4x = 5 \Rightarrow x = 5/4$$

199. 2

Sol. Prime no from 1 to 30

2, 3, 5, 7, 11, 13, 17, 19, 23, 29 = 10

$$\text{prob.} = \frac{10}{30} = \frac{1}{3}$$

200. 3

Sol. In two day insect climb = $2 - 1 = 1$ m.

So in 20 day, insect climb = 10 m.

In 21th day insect climb = 2m

$$\square \text{Total height} = 10 + 2 = 12 \text{ m}$$