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

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

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. $x = 0.\bar{7} = 0.7777.....(i)$

$10x = 7.777.....(ii)$

(ii) – (i)

$9x = 7$

$x = 7/9$

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

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

182. **1**

Sol. $a^x = b, b^y = c, c^z = a$

$a^{xy} = c \Rightarrow a^{xyz} = a^1$

$xyz = 1$

183. **1**

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

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

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

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

$a = 2, b = -1$

184. **4**

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

185. **3**

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

$7.7^x + \frac{7}{7^x} = 50$

Let $7^x = y$

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

$7y^2 + 7 = 50y$

$7y^2 - 50y + 7 = 0$

$7y^2 - 49y - y + 7 = 0$

$7y(y-7) - 1(y-7) = 0$

$y = 1/7, 7$

$\therefore 7^x = \frac{1}{7} \Rightarrow x = -1$

$7^x = 7 \Rightarrow x = 1$

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 = $\frac{10}{90} \times 100 = 11\frac{1}{9}\%$

187. **3**

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

188. **4**

Sol. C.P of pen (each) $= \frac{10}{11}\text{Rs.}$

S.P of pen (each) $= \frac{11}{10}\text{Rs.}$

So it is clean its profit

$\therefore \text{profit} = \frac{11}{10} - \frac{10}{11} = \frac{21}{110}\text{Rs.}$

so now profit% = $\left(\frac{21}{\frac{110}{10} \times \frac{10}{11}} \right) \times 100$

$= \frac{21 \times 11}{10 \times 110} \times 100 = 21\%$

189. **4**

Sol. $\frac{1}{3} + \frac{1}{4} = x\left(\frac{1}{3} - \frac{1}{4}\right)$

$\frac{7}{12} = x \times \frac{1}{12} \Rightarrow x = 7$

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.

$\therefore B's$ income less by $A = \frac{20}{120} \times 100$

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

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. $\frac{2}{2}\sin\theta\cos\theta = \frac{2\sin\theta\cos\theta}{2} = \frac{\sin 2\theta}{2}$

Min value of sin = - 1

$\therefore \min$ value of $\frac{\sin 2\theta}{2} = -\frac{1}{2}$

193. **2**

Sol. It following a particular pattern

$\frac{10^3 - 1}{111} = \text{Quotient} = 9, \frac{10^6 - 1}{111} = 9009$

similarly $\frac{10^{12} - 1}{111} = 9009009009$

194. **4**

Sol. $\log 3^{x+4} = \log 729$

$\therefore 3^{x+4} = 3^6$

$x + 4 = 6 \Rightarrow x = 2$

195. **1**

Sol. We all known that

$\frac{M_1 T_1 D_1}{W_1} = \frac{M_2 T_2 D_2}{W_2}$

$\frac{p \times p \times p}{p} = \frac{q \times q \times q}{w_2}$

$w_2 = \frac{q^3}{p^2}$

196. **4**

Sol. Using factor theorem,

Put x = - 1 in the equation

$(-1)^{100} + 2(-1)^{99} + k = 0$

$1 - 2 + k = 0$

$k = 1$

197. **2**

Sol. If original radius r

then volume of cylinder $= \pi r^2 h$

New radius = 1. 1r

New volume $= \pi \times 1.21\, r^2 h$

$= 1.21\pi r^2 h$

So increase in height $= \left(\frac{1.21-1}{1.21}\right) \times 100\%$

=17.36%

198. **1**

Sol. Square on both side

$x + 1 + x - 1 - 2\sqrt{x^2 - 1} = 1$

$2x - 1 = 2\sqrt{x^2 - 1}$

again sqaure

$4x^2 + 1 - 4x = 4\left(x^2 - 1\right)$

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

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

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

$\therefore$ Total height = 10 + 2 = 12 m