National Talent Search State Level Examination – 2018

Answer Key & Solutions

PART – I GENERAL MENTAL ABILITY TEST

1.	3	2.	1	3.	4	4.	3	5.	4
6.	3	7.	2	8.	1	9.	3	10.	4
11.	2	12.	1	13.	2	14.	4	15.	3
16.	1	17.	2	18.	4	19.	3	20.	1
21.	2	22.	4	23.	3	24.	2	25.	1
26.	*	27.	3	28.	1	29.	2	30.	3
31.	4	32.	1	33.	2	34.	3	35.	2
36.	1	37.	3	38.	4	39.	2	40.	1
41.	1	42.	4	43.	2	44.	3	45.	2
46.	3	47.	4	48.	4	49.	3	50.	2

PART – II LANGUAGE COMPREHENSIVE TEST

51.	4	52.	1	53.	1	54.	2	55.	4
56.	2	57.	2	58.	3	59.	3	60.	1
61.	2	62.	4	63.	3	64.	1	65.	4
66.	3	67.	1	68.	1	69.	4	70.	2
71.	2	72.	2	73.	2	74.	4	75.	1
76.	2	77.	2	78.	1	79.	1	80.	4
81.	3	82.	4	83.	3	84.	4	85.	2
86.	2	87.	2	88.	3	89.	4	90.	3
91.	4	92.	1	93.	4	94.	1	95.	4
96.	1	97.	3	98.	4	99.	4	100.	4

PART – III SCHOLASTIC APTITUDE TEST

PHYSICS

101.	3	102.	3	103.	4	104.	4	105.	3
106.	2	107.	2	108.	1	109.	1	110.	1
111.	1	112.	3	113.	3				

CHEMISTRY

114.	3	115.	1	116.	2	117.	3	118.	1
119.	1	120.	2	121.	1	122.	3	123.	4
124.	3	125.	4	126.	4	127.	2		

BIOLOGY

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

SOCIAL SCIENCE

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

MATHEMATICS

181.	4	182.	1	183.	3	184.	1	185.	2
186.	2	187.	3	188.	2	189.	4	190.	3
191.	3	192.	1	193.	2	194.	1	195.	1
196.	3	197.	3	198.	3	199.	1	200.	2

SOLUTION

PART – I GENERAL MENTAL ABILITY TEST

4. **3**
perfect square

10. **4**
$(6^4 - 6)$

13. **2**
difference

14. **4**
differences (3, 0, 6, 1, 9, 2, 12, 3)

16. **1**
$n^3 + 1$

19. **3**
FERK

20. **1**
WVKX

34. **3**
$7 \times 4 - 9$

35. **2**
$(4 \div 8) \times 6$

36. **1**
$3 \times 5 + 4$

37. **3**
$3 + 6 + 4 = 13 = 1 + 4$

38. **4**
add $\div 3$

41. **1**
V > S > T > R U

PART – III SCHOLASTIC APTITUDE TEST

PHYSICS

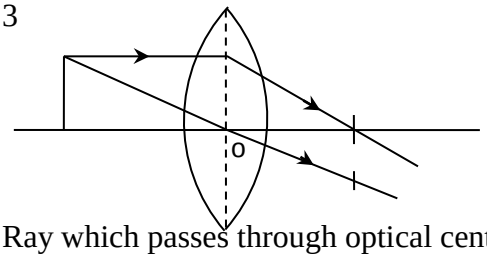
101. 3
Resistance is obstruction to the flow of electric current.

102. 3
Radiation
Conduction and convention needs medium to travel, while radiation does not need medium to travel.

103. 4
1000 cubic centimeter
$1\,\text{litre} = 10^{-3}\text{m}^3$
$\because 1\,\text{meter} = 100\,\text{cm}$
$\therefore 1\,\text{litre} = 10^{-3}(100\,\text{cm})^3 = 10^{-3} \times 10^6\ \text{cm}^3$
$1\,\text{litre} = 10^3\ \text{cm}^3$

104. Irregular & non – periodic vibration
Music is produced by regular and periodic vibrations
Noise is produced by irregular & non – periodic vibrations.

105. 3



Ray which passes through optical centre remains undeviated.

106. 2

$$C = \frac{5}{9}(F - 32)$$

$$\because \frac{C}{100} = \frac{F - 32}{180}$$

$$\Rightarrow \frac{9}{5}C = F - 32$$

$$\Rightarrow C = \frac{5}{9}(F - 32)$$

107. 2

Due to refraction when a light ray passes from dense medium is rarer medium it bends away from normal.

108. 1

4 Meter. Image formed by the plane mirror is at equal distance as that of the object from plane mirror.

109. 1

According to the law of floation weight of a floating body is equal to the weight of displaced liquid.

$\therefore$ Ans (1) wt. of displaced liquid.

110. 1

$$Req = R_1 + R_2$$

$$= (2 + 2)\Omega$$

$$= 4\ \Omega$$

$$\frac{1}{Req} = \frac{1}{R_1} + \frac{1}{R_2}$$

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

$(1) 4\ \Omega, 1\ \Omega$

111. 1

Second's needle of clock completer one revolution in one minute. Therefore its time period will be 1 minute.

112. 3

When an object is placed between two plane mirror infinite number of images will be formed.

113. In long lightens images is formed behind Retina.

CHEMISTRY

114. **3**
Ethylene double Bond

115. **1**
All non-metal oxide on reacting with water gives Acidic solution

116. **2**
Stainless steel contains Iron, Chromium, Carbon

117. **3**
Anthracite has maximum percentage of carbon

118. **1**
Factual

119. **1**
$Zn + 2HCl \rightarrow ZnCl_2 + H_2 \uparrow$

120. **2**
Bromine liquid at room temperature

121. **1**
Na reacts with cold water to give H_2 gas

122. **3**
Factual

123. **4**
Flint glass (Factual)

124. **3**
Controlled nuclear fission required in nuclear reactor.

125. **4**
Factual

126. **4**
$CaC_2 + H_2O \rightarrow C_2H_2 + Ca(OH)_2$

127. **2**
Fog → liquid in gas

BIOLOGY

128. **4**
Measles, Rabies & Polio are caused by viruses while Tuberculosis is a bacterial disease caused by *Mycobacterium tuberculii*.

129. **1**
Marasmus is a PEM (Protein energy Malnutrition) caused in children between 0-1 years.

130. **2**
Sonalika is a high yielding variety of wheat.

131. **1**
Red Blood Corpuscles are cells without nucleus.

132. **2**
Lamarckism is based on – (i) Use and disuse of organs (ii) Inheritance of acquired characters. Other three options are related to Darwinism.

133. **3**
Pepsin is not found in pancreatic juice but found in gastric juice secreted by stomach.

134. **4**
Sodium benzoate is a chemical used as preservative in Jams and jelly.

135. **1**
Retinol is common name of Vitamin A.

136. **4**
Thiamine is scientific name of vitamin B1, not found in RNA.

137. **2**
Maize is anemophilous flower in which pollination takes place by air.

138. **3**
Platypus is an egg laying mammal, most primitive mammal.

139. **1**
Silver fish is an insect belongs to phylum – Arthropoda, not a true fish.

140. **4**
BCG is a vaccine for tuberculosis developed by Calmette-Guerin.

MATHEMATICS

181. 4

$x^4 + 4y^4$

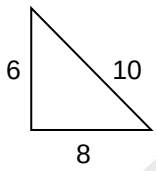
$x^2 + (2y)^2 - 4x^2y^2$

$(x^2 - 2y)^2$

182. 1

24

$\frac{1}{x} \times 6 \times 8 = 24$



183. 3

$\sqrt{10 + \sqrt{25 + 11}} = \sqrt{10 + 6} = \sqrt{16} = 4$

184. 1

$\frac{1}{2}\left[1(5 - b) + 3(b - 2) + 0\right] = 0$

$= 5 - b + 3b - 6 = 0$

$2b = 1$

$b = 1/2$

185. 2

$(t^3 - 2t + 1)$

186. 2

radii 2r, 3r

higt 4h,3h

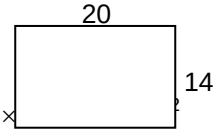
$\frac{\frac{1}{3}\pi r^2 h}{\pi r^2 h} = \frac{4r^2}{3 \times 9r^2} = \frac{4h}{3h} = \frac{16}{27 \times 3} = \frac{16}{81}$

187. 3

$2\pi r = 14$

$r = \frac{7 \times 7}{22}$

$2\pi rh = 14 \times$



188. 2

$5\theta = (180 - \theta)$

$6\theta = 180$

$\theta = 30$

150

189. 4

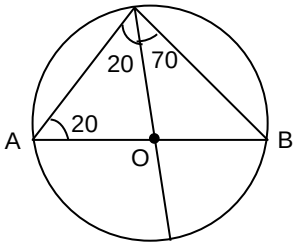
$1^3 - k(1)^2 + 11(1) - 6 = 0$

$|-k+1| - 6 = 0$

$k = 6$

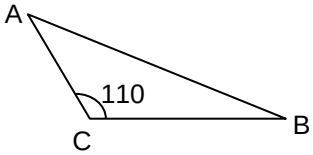
190. 3

20



191. 3

AB > AC



192. 1

$\frac{1}{x} + \frac{1}{50-x} = \frac{1}{12}$

$\frac{50-x+x}{x(50-x)} = \frac{1}{12}$

$600 = 50x - x^2$

$x^2 - 50x + 600 = 0$

$x^2 - 30x - 20x + 600 = 0$

$x = 30, 20$

193. 2

$5\cos A = 12 \text{ In } A$

$\tan A = 5/12$

$\frac{\tan A + 1}{2 - \tan A} = \frac{\frac{5}{12} + 1}{2 - \frac{5}{12}}$

$= \frac{\frac{17}{12}}{\frac{19}{12}} = \frac{17}{19}$

194. 1

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

$\frac{2\sqrt{a+x}}{2\sqrt{a-x}} = \frac{b+1}{b-1} \text{squaring}, \frac{a+x}{a-x} = \frac{b^2+1+2b}{b^2+1-2b}$

Again using compodendo & dividend 0 rule.

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

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

195. 1

$\log_4\log_2 x=1$

$\log_2 x=4$

$x=2^4=16$

196. 3

$8000\times\frac{10}{100}=800$

$8800\times\frac{20}{100}=1760$

$8800+1760=10560$

197. 3

$5=k^{1/p}$

$7=k^{1/q}$

$5\times7=k^{-1/q}$

$k^{1/p}\times k^{1/q}=k^{-1/r}$

$\frac{1}{p}+\frac{1}{q}+\frac{1}{r}=0$

198. 3

$\tan60=\frac{h+100}{x}$

$\sqrt{3}x=h+100$

$3h-300=h+100$

$2h=400$

$h=200$

$\left|\tan30=\frac{h-100}{x},x=h\sqrt{3}-100\sqrt{3}\right.$

199. 1

$\left(\frac{x_1+x_2+.....x_8}{8}\right)=152$

$\left(x_1+x_2+.....x_8\right)=152\times8$

New mean $=\frac{\left(x_1+x_2+.....x_8\right)+143+156}{10}$

$\frac{152\times8+143+156}{10}=151.5$

200. 2

$x=0.6666\quad.....(i)$

$10x=6.6666\quad.....(ii)$

subtract (ii) from $(i), 9x=6$

$x=\frac{6}{9}=\frac{2}{3},q=3$