

National Talent Search State Level Examination –2018

Answer Key & Solutions

PART – I 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

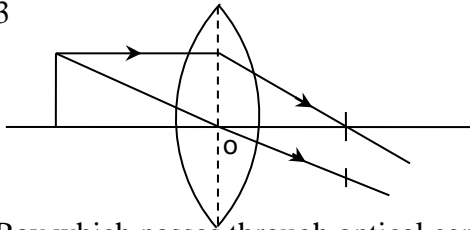
4. 3
perfect square
10. 4
 $(6^4 - 6)$
13. 2
difference
14. 4
differences (3, 0, 6, 1, 9, 2, 12, 3)
16. 1
 $n^3 + 1$
19. 3
FERK
20. 1
WVKX
34. 3
 $7 \times 4 - 9$
35. 2
 $(4 \div 8) \times 6$
36. 1
 $3 \times 5 + 4$
37. 3
 $3 + 6 + 4 = 13 = 1 + 4$
38. 4
add $\div 3$
41. 1
 $V > S > T > R U$

PART – III SCHOLASTIC APTITUDE TEST

PHYSICS

101. 3
Resistance is obstruction to the flow of electric current.
102. 3
Radiation
Conduction and convection needs medium to travel, while radiation does not need medium to travel.
103. 4
1000 cubic centimeter
 $1 \text{ litre} = 10^{-3} \text{ m}^3$
 $\therefore 1 \text{ meter} = 100 \text{ cm}$
 $\therefore 1 \text{ litre} = 10^{-3} (100 \text{ cm})^3 = 10^{-3} \times 10^6 \text{ cm}^3$
 $1 \text{ litre} = 10^3 \text{ cm}^3$
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

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

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

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

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

107. 2

Due to refraction when a light ray passes from dense medium to 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 floatation weight of a floating body is equal to the weight of displaced liquid.

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

110. 1

$$R_{eq} = R_1 + R_2$$

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

$$= 4\Omega$$

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$$

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

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

111. 1

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

112. 3

When an object is placed between two plane mirrors 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**
 $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \uparrow$
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**
 $\text{CaC}_2 + \text{H}_2\text{O} \rightarrow \text{C}_2\text{H}_2 + \text{Ca(OH)}_2$
127. **2**
Fog \rightarrow liquid in gas

BIOLOGY

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

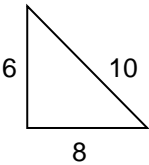
MATHEMATICS

181. **4**

$$x^4 + 4y^4$$

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

$$(x^2 - 2y)^2$$
182. **1**

$$\frac{1}{2} \times 6 \times 8 = 24$$

183. **3**

$$\sqrt{10 + \sqrt{25 + 11}} = \sqrt{10 + 6} = \sqrt{16} = 4$$
184. **1**

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

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

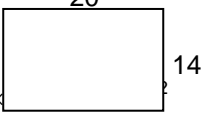
$$2b = 1$$

$$b = 1/2$$
185. **2**

$$(t^3 - 2t + 1)$$
186. **2**
 radii $2r, 3r$
 hight $4h, 3h$

$$\frac{\frac{1}{3}\pi r^2 h}{\pi r^2 h} = \frac{4r^2}{3 \times 9r^2} = \frac{4h}{3h} = \frac{16}{27 \times 3} = \frac{16}{81}$$
187. **3**

$$2\pi r = 14$$

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


$$2\pi r h = 14 \times$$
188. **2**

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

$$6\theta = 180$$

$$\theta = 30$$

$$150$$

189. 4

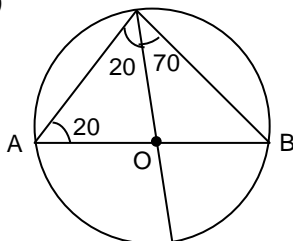
$$t^3 - k(1)^2 + 11(1) - 6 = 0$$

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

$$k = 6$$

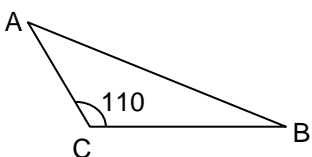
190. 3

$$20$$



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

$$5\cos A = 12 \ln A$$

$$\tan A = 5/12$$

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

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

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 componendo & dividendo rule.

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

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

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
 $5 = k^{1/p}$
 $7 = k^{1/q}$
 $5 \times 7 = k^{-1/q}$
 $k^{1/p} \times k^{1/q} = k^{-1/r}$
 $\frac{1}{p} + \frac{1}{q} + \frac{1}{r} = 0$

198. 3
 $\tan 60 = \frac{h+100}{x}$
 $\sqrt{3}x = h+100$
 $3h - 300 = h+100$
 $2h = 400$
 $h = 200$

$$\left. \begin{array}{l} \sqrt{3}x = h+100 \\ 3h - 300 = h+100 \\ 2h = 400 \\ h = 200 \end{array} \right\} \tan 30 = \frac{h-100}{x}, x = h\sqrt{3} - 100\sqrt{3}$$

199. 1
 $\left(\frac{x_1 + x_2 + \dots + x_8}{8} \right) = 152$
 $(x_1 + x_2 + \dots + x_8) = 152 \times 8$
 $\text{New mean} = \frac{(x_1 + x_2 + \dots + x_8) + 143 + 156}{10}$
 $\frac{152 \times 8 + 143 + 156}{10} = 151.5$

200. 2
 $x = 0.6666 \dots \dots \dots (i)$
 $10x = 6.6666 \dots \dots \dots (ii)$
 subtract (ii) from (i), $9x = 6$
 $x = \frac{6}{9} = \frac{2}{3}, q = 3$