

FIITJEE Solutions to NTSE-I (2014) (For Class X Students) (SAT)

Time: 90 Minutes

Max Marks: 90

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you open the Question Booklet.

1. Use blue/black ball point pen only.
2. Write your Roll No. very clearly (only one digit in on block) on this booklet and on the **ANSWER SHEET**.
3. This test consists of 90 questions of one mark each. All the questions are **COMPULSORY**.
4. Answer to each question by filling the correct alternative among the four choices on the answer sheet.

Example:

	Q.No.	Alternatives
Correct way:	1	<input type="radio"/> 1 <input type="radio"/> 2 <input checked="" type="radio"/> 3 <input type="radio"/> 4
	Q.No.	Alternatives
Wrong way:	1	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input checked="" type="radio"/> 4

5. Separate sheet has been provided for rough work in this test booklet.

91. A body falling from rest describes distances S_1 , S_2 and S_3 in the first, second and third seconds of its fall. Then the ratio of $S_1 : S_2 : S_3$ is :
- (1) 1 : 1 : 1 (2) 1 : 3 : 5
 (3) 1 : 2 : 3 (4) 1 : 4 : 9
91. **2**

91.
$$s = ut + \frac{1}{2}gt^2, \quad u = 0.$$

$$s = \frac{1}{2}gt^2$$

Here s is displacement.

Distance dropped in 1st second, $S_1 = \frac{1}{2}g \times (1)^2 = \frac{1}{2}g \times 1$

Distance dropped in 2nd second, $S_2 = \frac{1}{2}g \times (2)^2 - \frac{1}{2}g \times (1)^2 = \frac{1}{2}g \times 3$

Distance dropped in 3rd second, $S_3 = \frac{1}{2}g \times (3)^2 - \frac{1}{2}g \times (2)^2 = \frac{1}{2}g \times 5$

$S_1 : S_2 : S_3 = 1 : 3 : 5$

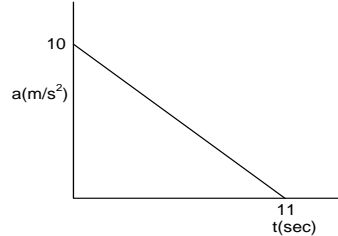
92. Two bodies with kinetic energies in the ratio 4 : 1 are moving with equal linear momentum. The ratio of their masses is :
- (1) 1 : 2 (2) 1 : 1
 (3) 4 : 1 (4) 1 : 4
92. **4**

92.
$$KE = \frac{p^2}{2m}.$$

$\therefore KE \propto \frac{1}{m}.$

93. Amount of light entering into the camera depends upon:
- (1) focal length of objective lens.
 (2) product of focal length & diameter of objective lens.
 (3) distance of objective from camera.
 (4) aperture setting of the camera.
93. **4**

94. A body starts from rest at time $t = 0$, the acceleration time graph is shown in figure. The maximum velocity attained by the body will be :



- (1) 110 m/s (2) 55 m/s
 (3) 650 m/s (4) 550 m/s
94. **2**

94. Area under acceleration – time graph gives change in velocity.

$$\frac{1}{2} \times 11 \times 10 = v - u, \quad \text{initial velocity } u = 0$$

$$V_{\max} = 55 \text{ m / s}$$

95. A comb run through one's dry hair attracts small bits of paper. This is due to :

- (1) comb is a good conductor
 (2) paper is a good conductor
 (3) The atoms in the paper gets polarised by the charged comb
 (4) the comb possesses magnetic properties

95. **3**

96. A wire of resistance R is stretched to twice of its original length. Its new resistance will be :

- (1) 4R
 (2) R/4
 (3) 2R
 (4) R/2

96. **1**

96. $R = \rho \ell / A$

New length $\ell' = 2\ell$.

New area of cross section $A' = A/2$

$$R' = \rho \frac{\ell'}{A / 2}$$

$$R' = 4R$$

97. On a cold morning, a metal surface will feel colder to touch than a wooden surface, because :

- (1) metal has high specific heat
 (2) metal has high thermal conductivity
 (3) metal has low specific heat
 (4) metal has low thermal conductivity

97. **2**

98. The resultant focal length of the lenses as shown in the figure is :

- (1) 2f
 (2) $\frac{f}{2}$
 (3) $\frac{f}{4}$
 (4) f

98. **2**

98. Both part will have same focal length 'f'

$$\text{Focal length of combination, } \frac{1}{F} = \frac{1}{f} + \frac{1}{f}$$

$$\therefore F = f/2$$

99. White colour of the cloud is due to :

- (1) reflection of seven colors of light
 (2) refraction of seven colors of light
 (3) scattering of seven colors of light
 (4) absorption of seven colors of light

99. **3**

99. Large dust particles and water droplets scatter all wavelength almost equally. Hence clouds appears white.

100. The magnetic field lines inside a long current-carrying solenoid are nearly :
 (1) Circular (2) Parabolic
 (3) Straight (4) Elliptical
100. **3**
101. An AC generator is connected to an electric appliance. In 10 revolutions of the armature the current in the appliance changes direction :
 (1) 5 times (2) 10 times
 (3) 20 times (4) 40 times
101. **3**
102. Ice is floating on water in a beaker when ice completely melts then level of water in beaker :
 (1) Increases (2) Decreases
 (3) Remains the same (4) First increases then decreases
102. **3**
102. Level of water remains constant as ice is less dense than liquid water. In ice, the water molecules are packed in cage structure. If it melts some of the water is free to move in between the free room in the crystalline cage structure.
103. Which one of the following is not a base?
 (1) $B(OH)_3$ (2) KOH
 (3) $Ca(OH)_2$ (4) NH_4OH
103. **1**
103. $B(OH)_3$ is boric acid.
 Also referred as H_3BO_3 .
104. Which of the following orders of atomic radii is correctly represented?
 (1) $B < Al < Ga$ (2) $B < Ga < Al$
 (3) $Al < B < Ga$ (4) $B > Ga > Al$
104. **2**
104. It is due to greater screening effect in aluminium, its radii is greater than gallium.
105. A sample of $MgCO_3$ contains 3.01×10^{23} Mg^{2+} ions and 3.01×10^{23} CO_3^{2-} ions. The mass of the sample is
 (1) 42 mg (2) 84 g
 (3) 0.042 kg (4) 42 mol
105. **3**
105. Sample contains 3.01×10^{23} $MgCO_3$ molecules.
 Therefore, 6.022×10^{23} molecules weigh 84 gms
 $\Rightarrow 3.01 \times 10^{23}$ molecules weigh $\frac{84}{2}$ gms
 $= 42$ gms
 $= 0.042$ kg
106. What are the electronic configurations of Na^+ and Cl^- ions?
 (1) $Na^+ = 2, 8, 1$ and $Cl^- = 2, 8, 7$ (2) $Na^+ = 2, 8$ and $Cl^- = 2, 8, 8$
 (3) $Na^+ = 2, 8, 2$ and $Cl^- = 2, 8, 6$ (4) $Na^+ = 2, 8$ and $Cl^- = 2, 8, 7$
106. **2**
106. $Na = 2, 8 \Rightarrow Na^+ = 2, 8, 1$
 $Cl = 2, 8, 7 \Rightarrow Cl^- = 2, 8, 8$

107. Which of the following has shortest carbon-carbon bond length?
 (1) C_2H_2 (2) C_2H_4
 (3) C_2H_6 (4) C_6H_6
107. 1
107. $H - C \equiv C - H$
 Triple bond is shorter in length than double bond and single bond.
108. Which of the following may be isomer of aldehyde having general formula $C_nH_{2n}O$?
 (1) Alcohol (2) Ether
 (3) Ester (4) Ketone
108. 4
108. Aldehydes and ketones are functional isomers of each other belonging to family of carbonyl compounds with general molecular formula $C_nH_{2n}O$.
109. Which of the following solution has the lowest pH value?
 (1) 0.1 Molar NaCl solution (2) 0.01 Molar $NaHCO_3$ solution
 (3) 0.001 Molar Na_2CO_3 solution (4) 0.01 Molar NaOH solution
109. 1
109. Other solutions will result in pH greater than 7.
 NaCl solution – neutral.
110. Which of the following has the greatest concentration of H^+ -ion?
 (1) 1 mol L^{-1} HCl solution (2) 1 mol L^{-1} H_3PO_2 solution
 (3) 1 mol L^{-1} H_2SO_4 solution (4) 1 mol L^{-1} H_2CO_3 solution
110. 3
110. Concentration of all the solutions is equal. Therefore, due to double dissociation of H_2SO_4 it will give greatest concentration of H^+ ion. On the other hand, H_2CO_3 being weak acid will dissociate partially.
111. Solder is an alloy of
 (1) Cu + Zn (2) Pb + Sn
 (3) Pb + Sb (4) Cu + Sn
111. 2
111. Solder is an alloy of Sn and Pb.
112. Which is the symbol of the element tungsten?
 (1) Ta (2) Tc
 (3) W (4) V
112. 3
112. Symbol of tungsten – W (Based on its latin name wolfram).
113. What mass of hydrogen and oxygen will be produced on complete electrolysis of 18g of water?
 (1) 2g hydrogen and 32g oxygen (2) 2g hydrogen and 16g oxygen
 (3) 4g hydrogen and 32g oxygen (4) 4g hydrogen and 14g oxygen
113. 2
113. $2H_2O \longrightarrow 2H_2 + O_2$
 \Rightarrow 36 gms of $H_2O \longrightarrow$ 4 gms of H_2 & 32 gms O_2
 \therefore 18 gms of $H_2O \longrightarrow$ 2 gms of H_2 & 16 gms O_2
114. A cell will plasmolyse, if it is placed in:
 (1) Hypertonic solution
 (2) Hypotonic solution
 (3) Isotonic solution
 (4) Concentration of water molecules does not matter
114. 1

114. When a plant cell is placed in hypertonic solution, plasmolysis will take place because of exosmosis.
115. In Xerophytes, the rate of water loss get reduced due to covering of epidermis by:
(1) Cutin (2) Suberin
(3) Lignin (4) Gum
115. 1
115. Cutin, a waxy layer prevents transpiration from aerial parts of xerophytes.
116. Given below are the pairs of disease and causal pathogen. Which one of these is not a matching pair?
(1) Kala azar – Leishmania (2) Sleeping sickness – Trypanosoma
(3) Malaria – Salmonella (4) Acne – Staphylococci
116. 3
116. Malaria is caused by *Plasmodium sp.*
117. During lack of oxygen in tissues of our body, the pyruvate is converted into lactic acid in:
(1) Mitochondria (2) Nucleus
(3) Cytoplasm (4) Ribosome
117. 3
117. Due to lack of oxygen, pyruvate does not enter the Krebs's cycle and gets converted into lactic acid in the cytoplasm.
118. The accumulation of non-biodegradable substances in a food chain in increasing amount at each higher trophic level is known as:
(1) Accumulation (2) Eutrophication
(3) Pollution (4) Bio magnification
118. 4
118. The increase in concentration of non-biodegradable substance with subsequent trophic level of a food chain is called bio-magnification.
119. Kidneys do not perform the function of:
(1) Regulation of blood pressure (2) Filtration of blood
(4) Regulation of ions concentration (4) Secretion of anti bodies
119. 4
119. Kidneys are not involved in secretion of antibodies.
120. Double fertilization is a unique feature of:
(1) Bryophytes (2) Angiosperm
(3) Algae (4) Gymnosperm
120. 2
120. Double fertilization is a characteristic of Angiosperms (flowering plants) in which zygote and endosperm nucleus are formed.
121. Phototropic and geotropic response of a plant is under control of following hormone:
(1) Auxin (2) Gibberlin
(3) Cytokinin (4) Ethylene
121. 1
121. Phototropic and geotropic movements of a plant depend upon different concentrations of auxin.
122. The following blood vessel does not contain deoxygenated blood:
(1) Pulmonary artery (2) Vena Cava
(3) Hepatic vein (4) Pulmonary Vein
122. 4
122. Pulmonary Vein carries oxygenated blood from the lungs to the left auricle of the heart.

123. If, in a plant, red colour of the flower is dominant over white. A cross was made between a plant containing red flower and other with white flower. The cross yielded 50% white flowered plant and 50% red flowered plant. The genotype of the parent with red flower is:

- (1) Homozygous (2) Heterozygous
 (3) Cannot be determined (4) Can be homozygous or heterozygous

123. 2

123. R = Red (Dominant)
 r = White (Recessive)

Rr X rr

♀/♂	R	r
r	Rr (Red)	rr (White)
r	Rr (Red)	rr (White)

124. Spinal cord originates from:

- (1) Cerebrum (2) Cerebellum
 (3) Medulla (4) Pons

124. 3

124. Spinal cord is an extension of medulla oblongata.

125. Photosynthesis is an important mode of autotrophic nutrition. The event which does not occur in photosynthesis is:

- (1) Conversion of light energy to chemical energy
 (2) Reduction of carbon dioxide to carbohydrate
 (3) Oxidation of carbon to carbondioxide
 (4) Absorption of light energy by chlorophyll

125. 3

125. During photosynthesis carbon dioxide gets reduced to carbohydrate but there is no oxidation of carbon to carbon dioxide.

126. If $\frac{x+a}{b+c} + \frac{x+b}{c+a} + \frac{x+c}{a+b} + 3 = 0$, $a > 0$, $b > 0$, $c > 0$, then the value of x is:

- (1) $-(a^2 + b^2 + c^2)$ (2) $(a + b + c)$
 (3) $-(a + b + c)$ (4) $\sqrt{a + b + c}$

126. 3

$$\frac{x+a}{b+c} + 1 + \frac{x+b}{c+a} + 1 + \frac{x+c}{a+b} + 1 = 0$$

$$\Rightarrow \frac{x+a+b+c}{b+c} + \frac{x+a+b+c}{c+a} + \frac{x+a+b+c}{a+b} = 0$$

$$\Rightarrow (x+a+b+c) \left[\frac{1}{b+c} + \frac{1}{c+a} + \frac{1}{a+b} \right] = 0$$

$$\Rightarrow x+a+b+c=0$$

$$\Rightarrow x = -(a+b+c)$$

127. Sum of the roots of the equation $4^x - 3(2^{x+3}) + 128 = 0$, is:

- (1) 0 (2) 7
 (3) 5 (4) 8

127. 2

$$4^x - 3(2^{x+3}) + 128 = 0$$

$$\Rightarrow (2^x)^2 - 24 \cdot 2^x + 128 = 0$$

$$\Rightarrow y^2 - 24y + 128 = 0$$

$$\Rightarrow y^2 - 8y - 16y + 128 = 0$$

$$\Rightarrow y(y-8) - 16(y-8) = 0$$

$$\Rightarrow (y-8)(y-16) = 0$$

$$\begin{aligned}
 y &= 8 \quad \text{or} \quad y = 16 \\
 2^x &= 2^3 \quad \quad \quad 2^x = 2^4 \\
 x &= 3 \quad \quad \quad x = 4 \\
 \text{sum of roots} &= 3 + 4 = 7
 \end{aligned}$$

128. If $\sin x + \operatorname{cosec} x = 2$, then $(\sin^{10} x + \operatorname{cosec}^{10} x)$ is equal to:
 (1) 3 (2) 0
 (3) 1 (4) 2

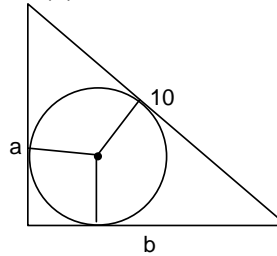
128. 4

$$\begin{aligned}
 \sin x + \operatorname{cosec} x &= 2 \\
 \Rightarrow \sin x + \frac{1}{\sin x} &= 2 \\
 \Rightarrow \sin^2 x + 1 &= 2\sin x \\
 \Rightarrow \sin^2 x - 2\sin x + 1 &= 0 \\
 \Rightarrow (\sin x - 1)^2 &= 0 \\
 \Rightarrow \sin x &= 1 \\
 \operatorname{cosec} x &= 1 \\
 \therefore \sin^{10} x + \operatorname{cosec}^{10} x &= 2
 \end{aligned}$$

129. The hypotenuse of a right triangle is 10cm and radius of the inscribed circle is 1 cm. The perimeter of the triangle is:
 (1) 15 cm (2) 22 cm
 (3) 24 cm (4) 18 cm

129. 2

$$\begin{aligned}
 r &= \frac{\Delta}{s} \\
 1 &= \frac{a \cdot b}{2s} \\
 a + b + 10 &= a \cdot b \\
 a + b &= ab - 10 \\
 (a + b)^2 &= (ab - 10)^2 \\
 a^2 + b^2 + 2ab &= a^2 b^2 - 20ab + 100 \\
 \therefore a^2 + b^2 &= 100 \\
 \Rightarrow 2ab &= a^2 b^2 - 20ab \\
 \Rightarrow a^2 b^2 - 22ab &= 0 \\
 \Rightarrow ab(ab - 22) &= 0 \\
 \Rightarrow ab &= 22 \quad \because ab \neq 0 \\
 \therefore \text{perimeter} &= a + b + 10 = ab = 22
 \end{aligned}$$



130. A shopkeeper blends two varieties of tea costing Rs 18 and Rs 13 per 100 gms in the ratio 7 : 3. He sells the blended variety at the rate of Rs 18.15 per 100 gm. His percentage gain in the transaction is:
 (1) 8% (2) 12%
 (3) 15% (4) 10%

130. 4

$$\begin{aligned}
 \text{CP} &= 18 \times \frac{7}{10} + 13 \times \frac{3}{10} \\
 &= \frac{126 + 39}{10} \\
 &= \frac{165}{10} \\
 &= \text{Rs } 16.5
 \end{aligned}$$

SP = Rs 18.15

Gain = Rs 1.65

$$\% \text{ gain} = \frac{1.65}{16.5} \times 100 = 10\%$$

131. If $\operatorname{cosec} 39^\circ = x$, the value of $\frac{1}{\operatorname{cosec}^2 51^\circ} + \sin^2 39^\circ + \tan^2 51^\circ - \frac{1}{\sin^2 51^\circ \sec^2 39^\circ}$, is

(1) $\sqrt{x^2 - 1}$

(2) $\sqrt{1 - x^2}$

(3) $x^2 - 1$

(4) $1 - x^2$

131. 3

$$\operatorname{cosec} 39^\circ = x \Rightarrow \sin 39^\circ = \frac{1}{x}$$

$$\sec 51^\circ = x \Rightarrow \cos 51^\circ = \frac{1}{x}$$

$$\begin{aligned} \sin 51^\circ &= \sqrt{1 - \cos^2 51^\circ} \\ &= \sqrt{1 - \frac{1}{x^2}} = \frac{\sqrt{x^2 - 1}}{x} \end{aligned}$$

$$\tan 51^\circ = \sqrt{x^2 - 1}$$

$$\cos^2 39^\circ = 1 - \sin^2 39^\circ = 1 - \frac{1}{x^2}$$

$$\begin{aligned} \therefore & \frac{1}{\operatorname{cosec}^2 51^\circ} + \sin^2 39^\circ + \tan^2 51^\circ - \frac{1}{\sin^2 51^\circ \sec^2 39^\circ} \\ &= \frac{x^{2-1} - 1}{x^2} + \frac{1}{x^2} + x^2 - 1 - \frac{x^2}{x^2 - 1} \times \frac{x^2 - 1}{x^2} \\ &= \frac{x^2 - 1 + 1}{x^2} + x^2 - 1 - 1 \\ &= 1 + x^2 - 1 - 1 \\ &= x^2 - 1 \end{aligned}$$

132. If $\frac{\tan \theta + \cot \theta}{\tan \theta - \cot \theta} = 2$, ($0^\circ \leq \theta \leq 90^\circ$), then the value of θ is:

(1) 60°

(2) 30°

(3) 90°

(4) 45°

132. 1

$$\frac{\tan \theta + \cot \theta}{\tan \theta - \cot \theta} = 2$$

$$\Rightarrow \frac{\frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{\sin \theta}}{\frac{\sin \theta}{\cos \theta} - \frac{\cos \theta}{\sin \theta}} = 2$$

$$\Rightarrow \frac{1}{\sin^2 \theta - \cos^2 \theta} = 2$$

$$\Rightarrow \sin^2 \theta - \cos^2 \theta = \frac{1}{2}$$

$$\Rightarrow 2\sin^2 \theta - 1 = \frac{1}{2}$$

$$\begin{aligned} \Rightarrow 2\sin^2 \theta &= \frac{3}{2} \\ \Rightarrow \sin^2 \theta &= \frac{3}{4} \\ \Rightarrow \sin \theta &= \frac{\sqrt{3}}{2} & 0 \leq \theta \leq 30^\circ \\ \Rightarrow \theta &= 60^\circ \end{aligned}$$

133. In a hostel, there was sufficient food for 200 students for 31 days. After 27 days 120 students left the hostel. For how many extra days will the rest of food last for remaining students:

- (1) 8 days (2) 6 days
(3) 12 days (4) 10 days

133.

2

There was sufficient food for 200 student for 31 days.

After 27 days 120 student left

So remaining students = $200 - 120 = 80$

Remaining days = $31 - 27 = 4$ days

Now there is sufficient food for 200 students for days.

\therefore 1 student can take the food = 200×4 days

\therefore 80 student can take the food = $\frac{200 \times 4}{80} = 10$ days

Extra days = $10 - 4 = 6$ days

134. If $x = \frac{1}{1 + \sqrt{2}}$, then the value of $x^2 + 2x + 3$ is:

- (1) 3 (2) 0
(3) 4 (d) 1

134.

3

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

after rationalization

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

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

$$\text{so } x^2 = 3 - 2\sqrt{2}$$

$$\therefore x^2 + 2x + 3 \Rightarrow (3 - 2\sqrt{2}) + 2(\sqrt{2} - 1) + 3 = 4$$

135. If α and β are the zeroes of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, then value of k is:

- (1) 8 (2) 6
(3) $\frac{13}{2}$ (4) 4

135.

2

$$f(x) = x^2 - 5x + k$$

α, β are roots of given equation

so sum of roots = $\alpha + \beta = 5$... (i)

product of roots = $\alpha\beta = k$... (ii)

given $\alpha - \beta = 1$... (iii)

by solving (i) and (iii)

$$\alpha = 3$$

$$\beta = 2$$

putting in equation (ii)

$$\alpha\beta = k$$

$$(iii)(ii) = k$$

$$k = 6$$

136. The value of $\left[\left(1 - \frac{1}{n+1} \right) + \left(1 - \frac{2}{n+1} \right) + \dots + \left(1 - \frac{n}{n+1} \right) \right]$ is:

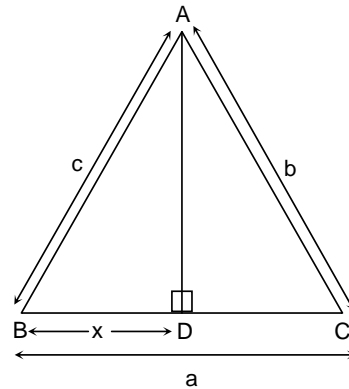
- (1) n (2) $\frac{n}{2}$
 (3) $n + 1$ (4) $2n$

136.

$$\begin{aligned} & \left[\left(1 - \frac{1}{n+1} \right) + \left(1 - \frac{2}{n+1} \right) + \dots + \left(1 - \frac{n}{n+1} \right) \right] \\ \Rightarrow & \left[(1+1+1+\dots+1) - \left(\frac{1}{n+1} + \frac{2}{n+1} + \dots + \frac{n}{n+1} \right) \right] \\ \Rightarrow & n - \frac{1}{n+1}(1+2+\dots+n) \\ \Rightarrow & n - \frac{n(n+1)}{2(n+1)} \\ \Rightarrow & n - \frac{n}{2} \\ \Rightarrow & \frac{n}{2} \end{aligned}$$

137. In $\triangle ABC$, segment $AD \perp BC$, If $BD = x$ units, then x is:

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



137.

1

 Given in $\triangle ABC$

$$AB = c$$

$$AC = b$$

$$BC = a$$

$$BD = x$$

$$\angle ADB = 90^\circ$$

$$\text{so } DC = a - x$$

 now in $\triangle ADB$

by Pythagoras theorem:

$$AB^2 = BD^2 + AD^2$$

$$c^2 = x^2 + AD^2 \quad \dots(i)$$

 Now in $\triangle ADC$

By Pythagoras theorem

$$AC^2 = AD^2 + DC^2$$

$$b^2 = AD^2 + (a - x)^2 \quad \dots(ii)$$

by solving (i) and (ii)

$$c^2 - b^2 = x^2 - (a - x)^2$$

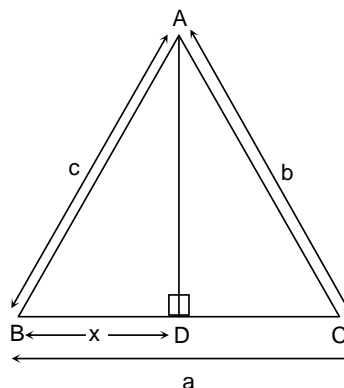
$$x^2 - b^2 = x^2 - a^2 - x^2 + 2ax$$

$$2ax = x^2 - b^2 + a^2$$

$$x = \frac{c^2 - b^2 + a^2}{2a}$$

$$x = \frac{a^2 - b^2 + c^2}{2a}$$

$$\text{or } x = \frac{c^2 + a^2 - b^2}{2a}$$



138.

The average marks scored by Ajay in certain number of tests is 84. He scored 100 marks in his last test. His average score of all these tests is 86, then the total number of tests he appeared is:

(1) 8

(2) 7

(3) 9

(4) 10

138.

1

$$x_1 + x_2 + x_3 + \dots + x_n = 84x$$

$$\frac{84x + 100}{x + 1} = 86$$

$$x = 7$$

$$\text{Total number of test } 7 + 1 = 8$$

139.

The first and last terms of an A.P. of n terms is 1, 31 respectively. The ratio of 8th term and $(n - 2)$ th term is 5 : 9, the value of n is:

(1) 14

(2) 15

(3) 16

(4) 13

139.

3

$$31 = 1 + (x - 1)d$$

$$(x - 1)d = 30 \quad \dots(A)$$

$$\text{ratio given as } \frac{8^{\text{th}} \text{ term}}{(n - 2)^{\text{th}} \text{ term}} = \frac{5}{9}$$

$$\frac{1 + 7d}{1 + (x - 3)d} = \frac{5}{9}$$

$$\text{from (A) } \frac{1 + 7d}{31 - 2d} = \frac{5}{9}$$

$$\therefore d = 2$$

from (A)
 $(x - 1) \times 2 = 30$
 $x - 1 = 15$
 $x = 16$

140. A number is selected at random from first 50 natural numbers. The probability that selected number is a multiple of 3 or 4 is:

- (1) $\frac{12}{25}$ (2) $\frac{14}{25}$
 (3) $\frac{14}{50}$ (4) $\frac{8}{25}$

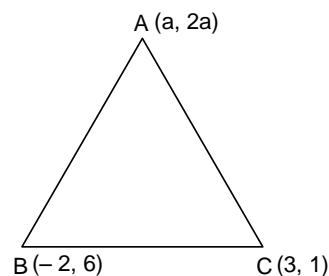
140. 1
 $n(s) = 1, 2, 3, \dots, 50$
 multiple of 3 = 3, 6, 9, ..., 48
 number of multiples of 3 = 16
 number of multiples of 4 = 12
 number of multiples of 3 and 4 = 4
 $\therefore n(A) = 16 + 12 - 4 = 28 - 4 = 24$

$$P(E) = \frac{24}{50} = \frac{12}{25}$$

141. The value(s) of a for which area of triangle, whose vertices are A(a, 2a), B(-2, 6) and C(3, 1) is 10 square units, are:

- (1) 0, 3 (2) 5, 8
 (3) $3, \frac{8}{3}$ (4) $0, \frac{8}{3}$

141. 4
 $ar = \frac{1}{2} |a(6 - 1) + (-2)(1 - 2a) + 3(2a - 6)| = 10$
 $5a - 2 + 4a + 6a - 18 = 20$
 $15a = 40$
 $a = \frac{40}{15} = \frac{8}{3}$

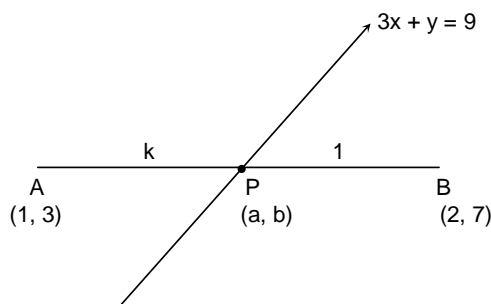


Zero is also satisfying the given condition answers is $\left(0, \frac{8}{3}\right)$.

142. The ratio in which the line $3x + y - 9 = 0$ divides the line segment joining points (1, 3) and (2, 7) is:

- (1) 3 : 4 (2) 2 : 3
 (3) 4 : 3 (4) 3 : 2

142. 1
 For point P(a, b)
 $a = \frac{2k + 1}{k + 1}$, $b = \frac{7k + 3}{k + 1}$ this values will satisfy
 the line $3x + y = 9$
 $\therefore 3\left(\frac{2k + 1}{k + 1}\right) + \frac{7k + 3}{k + 1} = 9$
 $\frac{6k + 3 + 7k + 3}{k + 1} = 9$
 $\therefore 13k + 6 = 9k + 9$



$$13k - 9k = 9 - 6 = 3$$

$$4k = 3 \therefore k = \frac{3}{4}$$

143. The radii of two circles are 9 cm and 12 cm. The circumference of a circle whose area is equal to sum of the areas of the two circles is:
 (1) 15 cm (2) 15π cm
 (3) 30π cm (4) 225 cm
143. 3
 Area of first circle = 81π
 Area of 2nd circle = 144π
 Area of 3rd circle = 225π
 Let radius of 3rd circle = R
 $\therefore \pi R^2 = 225\pi$
 $R^2 = 225$
 $R = 15$
 \therefore Circumference = $2 \times \pi \times 15 = 30\pi$ cm.
144. The diameter of a right circular cylinder is decreased by 10%. The volume of cylinder remains the same then the percentage increase in height is:
 (1) 20% (2) 23.45%
 (3) 5% (4) 20.5%
144. 2
 Let initial r = 100
 And initial h = 100
 \therefore initial volume = $\pi(100)^2 \times 100$
 later volume = $\pi(90)^2 \times h$
 According to condition
 $\pi(90)^2 \times h = \pi(100)^2 \times 100$
 $h = \frac{100 \times 100 \times 100}{90 \times 90} = \frac{10000}{81} = 123.45679$
 \therefore % increment in height = $123.45 - 100 = 23.45$
145. In an examination A got 25% marks more than B, B got 10% less than C and C got 25% more than D, If D got 320 marks out of 500, the marks obtained by A were:
 (1) 450 (2) 405
 (3) 360 (4) 400
145. 1
 D got 320
 C got 400
 B got 360
 A got 450
146. Kheda Movement (1917) was started for:
 (1) Farmers (2) Labourers
 (3) Mill Owners (4) Soldiers
146. 1
146. In 1917, Mahatma Gandhi organised peasants satyagraha at Kheda of Gujarat.
147. Bharat Mata, Painting was drawn by:
 (1) Rabindranath Tagore (2) Nand Lal Basu
 (3) Amrita Shergil (4) Abanindra Nath Tagore
147. 4
147. Abanindra Nath Tagore painted his famous image of Bharat Mata in 1905.

148. Gutenberg was associated with:
(1) Powerloom (2) Rail Engine
(3) Computer (4) Printing Press
148. 4
148. Gutenberg invented printing press in 1430s.
149. 'Depressed Class Association' was formed by:
(1) Jyoti Ba Phule (2) Mahatma Gandhi
(3) B. R. Ambedkar (4) Shahuji Maharaj
149. 3
149. Depressed Class Association was formed by B. R. Ambedkar in 1930.
150. Who were the 'Kulak' in soviet society?
(1) Small Farmers (2) Big Farmers
(3) Shop Keepers (4) Lawyers
150. 2
150. Kulaks were well-to-do peasants in the Soviet Society.
151. Reichstag was:
(1) French Parliament (2) Russian Parliament
(3) German Parliament (4) Japan Parliament
151. 3
151. Reichstag was the name of German Parliament.
152. Who was Viceroy of India during Civil Disobedience Movement?
(1) Lord Curzon (2) Lord Minto
(3) Lord Canning (4) Lord Irwin
152. 4
152. Lord Irwin was the Vicory of India during Civil Disobedience Movement.
153. Suffrage Movement was started for:
(1) The Right to Vote for Women (2) Right to Education
(2) Food for Poors (3) Peasant's Right
153. 1
153. Suffrage Movement was started for the right to vote for women.
154. Jacobin Club was the most powerful political organisation in:
(1) Germany (2) Russia
(3) France (4) Britain
154. 3
154. Jacobin Club was the most powerful political organisation in France.
155. What was "Dawes Plan"?
(1) Nazi Plan to supress the Jews
(2) American plan to control the Bolsevik
(3) Stalin plan of collectivisation
(4) American plan to take out Germany from the financial crisis (great depression)
155. 4
155. "Dawes Plan" was introduced by the USA to take out Germany from the financial crisis.
156. Which continent of today is not a part of Gondwana land:
(1) North America (2) South America
(3) Africa (4) Australia
156. 1
156. India, Australia, South Africa and South America were included in the Gondwana land.

157. Which of the following rivers of India flow through a rift valley?
(1) Tapi River (2) Ganga River
(3) Mahanadi River (4) Yamuna River
157. 1
157. The Narmada and the Tapi flow through the rift vallies.
158. Rainfall in the Northern and North-Western parts of India in the month of October-November is caused mainly due to?
(1) Western disturbances (2) Jet streams
(3) Advancing Monsoon (4) Upper Air Circulation
158. 1
158. Rainfall in the Northern and North-Western parts of India in the month of October-November is caused mainly due to Western disturbances.
159. The slash and burn agriculture is known as Milpa in which of the following countries?
(1) Indonesia (2) Mexico
(2) Vietnam (3) Sudan
159. 2
159. The slash and burn agriculture is known as Milpa in Mexico.
160. Which of the following is a non-renewable as well as non-recyclable resources?
(1) Iron (2) Coal
(3) Water (4) Forests
160. 2
160. Coal is non-renewable as well as non-recyclable resource.
161. Which of the following is not a nuclear power station?
(1) Kaiga (2) Narora
(3) Korba (4) Kakrapara
161. 3
161. Korba is a thermal power station in Chhatisgarh.
162. Which of the following is the working age group of the population?
(1) 15-59 years (2) 20-60 years
(3) 20-65 years (4) 18-60 years
162. 1
162. Working age group of the population is 15-59 years.
163. According to Census of India 2001 a literate person is the one who:
(1) can read and write his/her name
(2) can read and write any language
(3) is 7 years old and can read and write any language with understanding
(4) knows 3 R's (reading, writing, arithmetic)
163. 3
163. According to Census of India 2001 a literate person is the one who is 7 years old and can read and write any language with understanding.
164. National Waterways No. 1 of India connects which two cities of India?
(1) Sadia – Dubri (2) Allahabad – Haldia
(3) Kottapuram – Kollam (4) Delhi – Kanpur
164. 2
164. National Waterways No. 1 of India connects Allahabad to Haldia.
165. Which state of India has made roof top rain water harvesting compulsory to all houses:
(1) Andhra Pradesh (2) Tamil Nadu
(3) Kerala (4) Karnataka

165. 2
165. Tamil Nadu has made rooftop rain water harvesting compulsory to all houses.
166. In contemporary world, which quality makes democracy superior to any other form of Government:
(1) Efficiency (2) Responsiveness
(3) Transparency (4) Legitimacy governance
166. 4
166. In contemporary world legitimacy governance makes democracy superior to any other form of government.
167. Gender division refers to:
(1) Unequal child sex ratio (2) Absence of voting rights
(3) Biological differences (4) Unequal roles assigned to men and women
167. 4
167. Gender division refers to unequal roles assigned to men and women
168. When was the "Kittiko-Hachchiko" movement started?
(1) 1984 (2) 1986
(3) 1987 (4) 1983
168. 3
168. In 1987, the "Kittiko-Hachchiko" movement started in Karnataka.
169. Who is the Political Head of Municipal Corporation:
(1) Collector (2) Pradhan
(3) Mayor (4) Sarpanch
169. 3
169. Mayor is the political head of Municipal Corporation.
170. Which one of the following parties grew out of a movement?
(1) Communist Party of India (2) Bahujan Samaj Party
(3) Assam Gana Parishad (4) Assam United Democratic Front
170. 3
170. The Assam Gana Parishad in Assam grew out of a student movement.
171. Who was the Chairman of the Drafting Committee of Indian Constitution?
(1) Moti Lal Nehru (2) B. R. Ambedkar
(3) Jawahar Lal Nehru (4) Rajender Prasad
171. 2
171. B. R. Ambedkar was the Chairman of the Drafting Committee of Indian Constitution.
172. Amnesty International is an international organisation which works for:
(1) World Peace (2) Human Rights
(3) Justice (4) Restoration of Democracy
172. 2
172. Amnesty International is an international organisation which works for Human Rights.
173. Name the Law which empowers the people to carry on democratic reforms:
(1) Company Act (2) M. R. T. P.
(3) Right to Information (4) Right to Vote
173. 3
173. Right to Information Act is the law which empowers the people to carry on democratic reforms.
174. Which of the following is the main feature of Pressure group?
(1) Direct control on political power (2) Try to influence the politics of Government
(3) Lax Organisation (4) Direct participation in Political Power

174. 2
174. Pressure group do not controlled directly the political power but try to influence the politics of government.
175. In case of conflict between the centre and the State Government over a subject in the concurrent list:
(1) The state has the upper hand
(2) The centre has the upper hand
(3) Both are equally applicable
(4) Supreme Court decides whether the State Law should prevail or Central Law
175. 2
175. In case of conflict between the centre and the State Government over a subject in the concurrent list, the centre has the upper hand.
176. Who is known as the father of Green Revolution?
(1) Verghese Kurien (2) Babu Jagjivan Ram
(3) M. S. Swaminathan (4) M. S. Subhramanyam
176. 3
176. M. S. Swaminathan is known as the father of Green Revolution in India.
177. An example of Indirect Taxes is:
(1) Income Tax (2) Corporate Tax
(3) Estate Tax (4) Entertainment Tax
177. 4
177. Entertainment Tax is an example of Indirect taxes.
178. Which academy supports food security programme?
(1) Academy of Development Science (2) Academy of Crop Science
(3) Academy of Food Security (4) Academy of Grain Science
178. 1
178. The Academy of development Science supports food security programme in Maharashtra.
179. Which summit of BRICS held in 2014?
(1) 5th (2) 6th
(3) 4th (4) 7th
179. 2
179. The 6th summit of BRICS held in July 2014 in Brazil.
180. COPRA is related to:
(1) Trader (2) Environment
(3) Agriculture (4) Consumer
180. 4
180. COPRA is related to consumer.