Date: 05/11/2017

Max. Marks: 100   **SOLUTIONS**   **Time allowed: 90 mins**

101. A train of length 50 m is moving with a constant speed of 10 m/s. Calculate the time taken by the train to cross an electric pole and a bridge of length 250 m.

(1) 25 sec.   (2) 30 sec.   (3) 45 sec.   (4) 15 sec.

Ans. (2)

Sol. Speed = $\dfrac{\text{Distance}}{\text{Time taken}}$

$10 \text{ m/s} = \dfrac{300}{t}$

t = 30 sec

102. A car travels at a speed of 80 km/h during the first half of its running time and at 40 km/h during the other half, then the average speed of the car

(1) 50 km/hr   (2) 75 km/hr   (3) 60 km/hr   (4) 40 km/hr

Ans. (3)

Sol. $V_{avg} = \dfrac{u+v}{2} = \dfrac{40+80}{2} = 60 \text{ km/hr}$

103. The distance travelled by an object in a specified direction is

(1) Speed   (2) Displacement   (3) Velocity   (4) Acceleration

Ans. (2)

Sol. Displacement is the distance travelled by an object in a particular direction.

104. What is the acceleration of the race car that moves at constant velocity of 300 km/hr?

(1) 73.32 m/sec.   (2) 83.33 m/sec.   (3) 63.33 m/sec.   (4) 53.33 m/sec.

Ans. (Bonus)

Sol. Acceleration is zero for a body moving with constant velocity.

105. A car travels from rest with a constant acceleration 'a' for t seconds. What is the average speed of the car for its journey, if the car moves along a straight road?

(1) $v = \dfrac{at^2}{2}$ (2) $v = 2at^2$ (3) $v = \dfrac{at}{2}$ (4) None

Ans. (3)

Sol. $S = ut + \dfrac{1}{2}at^2$ u = 0 $S = \dfrac{1}{2}at^2$

$V_{avg} = \dfrac{s}{t} = \dfrac{\frac{1}{2}at^2}{t}$ $V_{avg} = \dfrac{1}{2}at$

106. A table clock has its minutes hand 4 cm long. Find the average velocity of the tip of the minute hand between 6.00 am to 6.30 am.

(1) 0.04 cm/sec   (2) 0.004 cm/sec   (3) 0.0044 cm/sec   (4) None

Ans. (3)

Sol. Average velocity = $\dfrac{\text{Displacement}}{\text{time}} = \dfrac{8}{60 \times 30}$

$V_{avg.}$ = 0.0044 cm/sec.

107. Two people push a car for 3 sec, with a combined net force of 200 N. The impulse provided to the car

(1) 400 N-sec.   (2) 500 N-sec.   (3) 600 N-sec.   (4) 300 N-sec.

Ans. (3)

Sol. $J = F \times t = 200 \times 3$

$J = 600$ N sec.

108. A man of mass 30 kg uses a rope to climb which bears only 450 N. The maximum acceleration with which he can climb safely

(1) 10 m/sec^2 (2) 15 m/sec^2 (3) 20 m/sec^2 (4) 25 m/sec^2

Ans. (2)

Sol. $F = ma$

$450 = 30 \times a$

$a = 15$ m/s^2

109. The value of least distance of clear vision is about

(1) 55 cm   (2) 40 cm   (3) 20 cm   (4) 25 cm

Ans. (4)

Sol. The least distance of clear vision is about 25 cm.

110. The unit of power of a lens (P) is

(1) cm   (2) mm   (3) diopter   (4) hertz

Ans. (3)

Sol. Unit of power is diopter (D).

111. A wire of length 1 m and of radius 0.1 mm has a resistance of 100 Ω. The resistivity of the material

(1) 0.0214 Ω-m   (2) 0.00314 Ω-m   (3) 0.0000314 Ω-m   (4) 0.00214 Ω-m

Ans. (Bonus question)

Sol. $R = \dfrac{\rho \ell}{A}$ $\rho = \dfrac{RA}{\ell} = \dfrac{100 \times \pi r^2}{\ell} = \dfrac{100 \times 3.14 \times (0.1 \times 10^{-3})^2}{1}$

$= 314 \times 10^{-8}$ Ωm

112. The S.I. unit of potential difference is

(1) ohm   (2) ampere   (3) ohm-meter   (4) volt

Ans. (4)

Sol. S.I. unit of potential difference is volt.

113. The value of magnetic field induction, which is uniform, is 2T. What is the flux passing through a surface of area 1.5 m^2 perpendicular to the field ....

(1) 3 Tesla   (2) 1 Wb/m^2 (3) 2 Tesla   (4) None

Ans. (4)

Sol. $\phi = B \times A$

$\phi = 2 \times 1.5$

$\phi = 3$ W

114. Precipitate in a reaction is indicated by which arrow mark?

(1) $\rightarrow$ (2) $\uparrow$ (3) $\downarrow$ (4) $\leftarrow$

Ans. **(3)**

Sol. The symbol of precipitate is $\downarrow$.

115. What colour would Hydrochloric acid (pH = 1) turn universal indicator?

(1) Orange   (2) Purple   (3) Yellow   (4) Red

Ans. **(4)**

Sol. Red

116. The pain due to honey-bee sting can be relieved by using

(1) Washing soda   (2) Salt   (3) Acid   (4) Baking soda

Ans. **(4)**

Sol. Baking soda

Honey bee injects methanoic acid which is neutralised by mild base like baking soda ($NaHCO_3$).

117. The quantum number which explains about size and energy of the orbit or shell is..........

(1) n   (2) ℓ (3) m_l (4) m_s

Ans. **(1)**

Sol. Principal quantum no is denoted by 'n' which explain about size and energy of orbit or shell.

118. The maximum number of electrons in any shell is given by..........rule.

(1) 2n   (2) n^2 (3) $2n^2$ (4) $4n^2$

Ans. **(3)**

Sol. $2n^2$

The maximum no. of electron present in any shell is given $2n^2$

119. Example of Dobereiner's triad is ......

(1) Li, Al, Ca   (2) Li, Na, K   (3) Li, K, Na   (4) K, Al, Ca

Ans. **(2)**

Sol. Li, Na, K are Dobereiner's triad. The atomic mass of middle element was approximately the arithmetic mean of the other two elements of the triad.

120. Unit of ionization energy ....

(1) J/m   (2) $KJ \cdot mol$ (3) $J \cdot mol$ (4) $KJ \cdot mol^{-1}$

Ans. **(4)**

Sol. $KJ \cdot mol^{-1}$

Unit of ionization energy is $KJ \cdot mol^{-1}$.

121. The concept hybridisation of orbits of an atom was introduced by ....

(1) Linus Pauling   (2) Moseley   (3) Lewis   (4) Kossel

Ans. **(1)**

Sol. Linus Pauling

122. Which one of the following is available in three states ....

(1) Petrol   (2) Water   (3) Milk   (4) Kerosene

Ans. **(2)**

Sol. Water exist in three states as ice(s), water (liquid) and water vapour (gas)

123. The gas that diffuses from blood to lungs is ....

(1) Oxygen   (2) Carbon dioxide   (3) Hydrogen   (4) Helium

Ans. (2)

Sol. Lungs purify the impure blood which contains CO_2 gas.

124. If 100 gm of salt solution contains 20 g of salt dissolved in it, the percentage of mass of the solution is.......

(1) 10%   (2) 20%   (3) 15%   (4) 25%

Ans. (2)

Sol. Mass by mass% = $\dfrac{\text{mass of solute}}{\text{mass of solution}} \times 100 = \dfrac{20\text{ g}}{100\text{ g}} \times 100 = 20\%$

125. Miscible liquids can be separated by..........

(1) Distillation process   (2) Fractional distillation   (3) Chromatography   (4) Separating funnel

Ans. (1,2)

Sol. We use distillation and fractional distillation process for separating miscible liquids in the diffrence of their boiling points.

126. Molecular mass of water............

(1) 18 u   (2) 16 u   (3) 15 u   (4) 10 u

Ans. (1)

Sol. Formula of water = H_2O

molecular mass of water = 2 ×[Atomic mass of hydrogen] + 1 ×[Atomic mass of oxygen]

= 2 ×[1] + 1 ×[16]

= 18 u

127. According to the compatibility of Antigen and Antibody, select the correct pair.

(1) Antigen B and Antibody b.   (2) Antigen A and Antibody b.

(3) Antibody a and Antigen B.   (4) Both (2) and (3)

Ans. (4)

Sol. Antigen and antibody reacts with each other and produce reactions. Antigen A reacts with antibody A, Antigen B reacts with antibody B.

128. In atmosphere, Ozone hole refers to..........

(1) A hole in Ozone layer.

(2) Decrease in Ozone layer thickness in troposphere.

(3) Decrease in thickness of Ozone layer in stratosphere.

(4) Increase in the thickness of Ozone layer in troposphere.

Ans. (3)

Sol. Ozone is a protective layer present in the stratosphere, ozone hole refers to the decrease in the thickness of this layer mainly due to CFC's.

129. The function of enzyme Trypsin is to..........

(1) breakdown fats.   (2) breakdown proteins.

(3) synthesise proteins.   (4) breakdown carbohydrates.

Ans. (2)

Sol. Trypsin is produced by pancreas and is responsible for digestion of proteins.

130. The offspring resulting' from a cross between two pure homozygous recessives would be....

(1) 50% homozygous recessive and 50% homozygous dominant.

(2) 75% homozygous recessive and 25% heterozygous dominant.

(3) 75% homozygous recessive and 25% homozygous dominant.

(4) 100% homozygous recessive.

Ans. (4)

Sol. Cross between two pure homozygous recessive parents.

tt × tt

	t	t
t	tt	tt
t	tt	tt

produce all recessive offsprings.

131. Match the following pairs correctly.

(i) Fish   (a) Three chambered heart.

(ii) Lizard   (b) Incomplete four chambered heart.

(iii) Man   (c) Two chambered heart.

(iv) Frog   (d) Complete four chambered heart.

(1) (i)-b, (ii)-c, (iii)-a, (iv)-d   (2) (i)-c, (ii)-b, (iii)-d, (iv)-a

(3) (i)-a, (ii)-c, (iii)-d, (iv)-b   (4) (i)-c, (ii)-a, (iii)-d, (iv)-b

Ans. (2)

Sol. Fish – 2 chambered heart.

Lizard – Incomplete 4 chambered heart.

Man – Complete 4 chambered heart

Frog – 3 chambered heart.

132. The significance of Greenhouse gases in earth's atmosphere is......

(1) They maintain a warm temperature on earth by absorbing short wave-length radiations.

(2) They do not allow earth's temperature to drop very low by absorbing long wavelength radiations.

(3) They reflect Sun's heat back to atmosphere.

(4) Both (1) and (2).

Ans. (2)

Sol. Green house gases increase the temperature of earth by absorbing long wave length radiations reflected from earth.

133. Which of the below given statements stands true ?

(1) A person can contract AIDS due to unprotected sexual intercourse with an infected person.

(2) A person can contract AIDS while getting permanent tattooing with an infected needle.

(3) A person cannot contract AIDS by donating blood to a HIV infected person.

(4) All the statements are true.

Ans. (4)

Sol. AIDS usually spreads due to unprotected sexual intercourse with infected person and also by sharing infected needle.

134. Among the vertebrates, which organism exhibits maximum power of re-generation ?

(1) Dog   (2) Lizard   (3) Pigeon   (4) Man

Ans. (2)

Sol. Lizard has very good regeneration capacity.

135. What will happen if the deer is missing in the food chain given below :

    Grass $\rightarrow$ Deer $\rightarrow$ Tiger

(1) The population of tiger increases.

(2) The population of grass decreases.

(3) Tiger will start eating grass.

(4) The population of tiger decreases and the population of grass increases.

Ans. (4)

Sol. Grass $\rightarrow$ Deer $\rightarrow$ Tiger

If deer is removed from food chain then entire food chain get's disturbed it will lead to increase in population of grass and decreased population of tiger.

136. One gram mole of Glucose on complete oxidation to CO_2 and H_2O produces about.........:

(1) 6,86,000 Cal   (2) 6,860 Cal   (3) 68,600 Cal   (4) 68,60,000 Cal

Ans. (1)

Sol. One gram mole of glucose on complete oxidation gives 6,86,000 cal. energy.

137. The transport of soluble products of photosynthesis is called Translocation, which occurs in the part of vascular tissue called

(1) Xylem   (2) Sclerenchyma   (3) Phloem   (4) Collenchyma

Ans. (3)

Sol. Phloem, is responsible for the translocation of soluble products in plants.

138. What will be the genotypic ratio of the cross between Rr and rr ?

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

Ans. (3)

Sol. A cross between Rr and rr

Offspring produced are – Rr, Rr, rr, rr.

Genotypic ratio is 1 : 1

139. By studying analogous structures, we look for

(1) Similarities in appearance and function but difference in structure.

(2) Similarities in appearance but difference in function.

(3) Similarities in organ structure.

(4) Similarities in cell make up.

Ans. (1)

Sol. Analogous structures are having similar function but different structure.

140. Placenta is the structure formed

(1) by fusion of germ layers.   (2) by foetus only.

(3) by the union of foetal and uterine tissue.   (4) by uterus only.

Ans. (3)

Sol. Placenta is formed by the union of foetus and mother's uterine tissue.

141. When 31513 and 34369 are divided by a certain three digit number, the remainders are equal, then the remainder is ....

(1) 86   (2) 97   (3) 374   (4) 113

Ans. (2)

Sol. $31513 = n + m \times abc$

$34369 = n + s \times abc$

$34369 - 31513 = (s - m)abc$

$2856 = 2 \times 2 \times 2 \times 3 \times 7 \times 17$

Possibilities for abc are :-

$abc = 2 \times 2 \times 2 \times 3 \times 7 = 168$	$R = 97$
$abc = 2 \times 2 \times 2 \times 3 \times 17 = 408$	$R = 97$
$abc = 2 \times 2 \times 2 \times 17 = 136$	$R = 97$
$abc = 2 \times 2 \times 3 \times 17 = 204$	$R = 97$
$abc = 2 \times 2 \times 7 \times 17 = 476$	$R = 97$

and so on.

In all the cases remainder is always 97.

142. The greatest number of four digits which when divided by 3, 5, 7, 9 leaves the remainders 1, 3, 5, 7 respectively, is ....

(1) 9763   (2) 9673   (3) 9367   (4) 9969

Ans. (1)

Sol. $3 - 1 = 5 - 3 = 7 - 5 = 9 - 7 = 2$

So number = L.C.M. (3, 5, 7, 9) – 2

L.C.M. (3, 5, 7, 9) = 315

For greatest 4-digit number = $\dfrac{9999}{315}$ = 31

So, $315 \times 31 - 2$

$\Rightarrow 9765 - 2 = 9763$

143. $e\,f\,g\,h$ is a four digit number. One hundredth of $e\,f\,g\,h$ is the mean of ef and gh, then the four digit number is

(1) 3648   (2) 4950   (3) 4590   (4) 3468

Ans. (2)

Sol. $\dfrac{efgh}{100} = \dfrac{ef + gh}{2}$

$\dfrac{1}{100}[1000e + 100f + 10g + h] = \dfrac{1}{2}[(10e + f) + (10g + h)]$

$(10e + f) + \dfrac{1}{100}(10g + h) = \dfrac{1}{2}(10e + f) + \dfrac{1}{2}(10g + h)$

$\dfrac{1}{2}(10e + f) = \dfrac{49}{100}(10g + h)$

$\Rightarrow 50(10e + f) = 49(10g + h)$ ..... (1)

So that $10e + f = 49$

                     $10g + g = 50$

    $efgh = 4950$

144. If $x^2 + xy + x = 12$ and $y^2 + xy + y = 18$, then the value of $x + y$ is ....

    (1) 5 or – 6   (2) 3 or 4   (3) 5 or 3   (4) 6 or – 3

Ans. (1)

Sol. $x^2 + xy + x = 12$ ..... (1)

    $y^2 + xy + y = 18$ ..... (2)

    Adding eq (1) and (2)

    $\Rightarrow\ x^2 + 2xy + y^2 + x + y = 30$

    $\Rightarrow\ (x + y)^2 + (x + y) = 30$

    $\Rightarrow\ (x + y)(x + y + 1) = 30$

    So $x + y = 5$ or -6

145. If $217x + 131y = 913$ and $131x + 217y = 827$, then the value of $x + y$ is ....

    (1) 8   (2) 5   (3) 7   (4) 6

Ans. (2)

Sol. $217x + 131y = 913$ ...... (1)

    $131x + 217y = 827$ ...... (2)

    Adding equation (1) and (2)

        $348x + 348y = 1740$

        $x + y = 5$

146. If $x = \cfrac{1}{2 - \cfrac{1}{2 - \cfrac{1}{2 - x}}}$, $(x \neq 2)$ then the value of x is ....

    (1) 1   (2) 3   (3) 2   (4) 5

Ans. (1)

Sol. $x = \cfrac{2}{2 - \cfrac{1}{2 - \cfrac{1}{2 - x}}} \Rightarrow \cfrac{2}{2 - \cfrac{1}{\cfrac{4 - 2x - 1}{2 - x}}}$

    $\Rightarrow \cfrac{1}{2 - \cfrac{2 - x}{3 - 2x}} \Rightarrow \cfrac{1}{\cfrac{6 - 4x - 2 + x}{3 - 2x}}$

    $\Rightarrow \dfrac{3 - 2x}{4 - 3x} = x$

    $\Rightarrow 3 - 2x = 4x - 3x^2$

    $\Rightarrow 3x^2 - 6x + 3 = 0$

    $\Rightarrow x^2 - 2x + 1 = 0$

    $\Rightarrow (x - 1)^2 = 0$

    $\Rightarrow x = 1$

147. x_1, x_2, x_3 ...... are in A.P. If $x_1 + x_7 + x_{10} = -6$ and $x_3 + x_8 + x_{12} - 11$, then $x_3 + x_8 + x_{22} = ?$

    (1) −21   (2) −15   (3) −18   (4) −31

Ans. (1)

Sol. $x_1 + x_7 + x_{10} = -6$

    $\Rightarrow 3a + 15d = -6$ .... (1)

    and $x_3 + x_8 + x_{12} = -11$

    $\Rightarrow 3a + 20d = -11$ .... (2)

    Subtracting equation (1) from (2)

    $\Rightarrow d = -1$

    From (1), a = 3

    So, $x_3 + x_8 + x_{22}$

    $\Rightarrow a + 2d + a + 7d + a + 21d$

    $\Rightarrow 3a + 30d$

    $\Rightarrow -21$

148. If $\dfrac{2+5+8+.....n \text{ terms}}{7+11+16+....n \text{ terms}} = \dfrac{23}{35}$, then n value is ....

    (1) 17   (2) 15   (3) 18   (4) 23

Ans. (2)

Sol. $\dfrac{4+(n-1)3}{14+(n-1)4} = \dfrac{23}{35}$

    $\Rightarrow \dfrac{3n+1}{4n+10} = \dfrac{23}{35}$

    $\Rightarrow 105n + 35 = 92n + 230$

    $\Rightarrow 13n = 195$

    $\Rightarrow n = 15$

149. If the co-ordinates of the midpoints of the sides of a triangle are (1, 1), (2, −3) and (3, 4), then the centroid of the triangle is .....

    (1) $\left(3, \dfrac{1}{3}\right)$ (2) $\left(1, \dfrac{2}{3}\right)$ (3) (3, 1)   (4) $\left(2, \dfrac{2}{3}\right)$

Ans. (4)

Sol. Let A, B, C be the vertices and P, Q, R be the mid point of the sides of a triangle. Then,

    $\Rightarrow a_1 + a_2 + a_3 = 1 + 2 + 3 = 6$ and $b_1 + b_2 + b_3 = 2$

    $\therefore$ Centroid is $\left(\dfrac{a_1 + a_2 + a_3}{3}, \dfrac{b_1 + b_2 + b_3}{3}\right)$

    $= \left(2, \dfrac{2}{3}\right)$
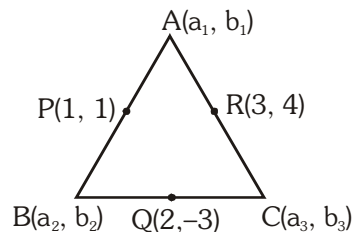
150. If two vertices of an equilateral triangle be (0, 0) and $\left(3,\sqrt{3}\right)$, then the third vertex is ......

(1) $\left(1,3\sqrt{3}\right)$ (2) $\left(0,2\sqrt{3}\right)$ (3) $\left(3,\sqrt{3}\right)$ (4) $\left(1,\sqrt{3}\right)$

Ans. (2)

Sol. Let the third vertex be C(x, y)

Then,

$\Rightarrow$ $AB^2 = BC^2 = CA^2$

$\Rightarrow$ $12 = (x-3)^2 + \left(y - \sqrt{3}\right)^2 = x^2 + y^2$

$\Rightarrow$ $12 = x^2 + y^2 - 6x - 2\sqrt{3}\,y + 12 = x^2 + y^2$

On solving, we get $\boxed{x = 0, y = 2\sqrt{3}}$
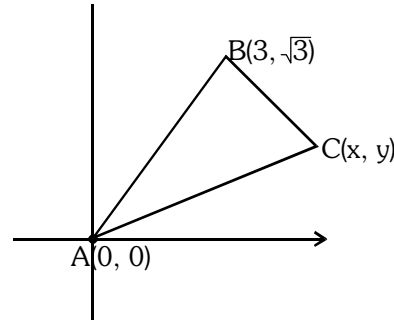
151. As shown in the given figure, ΔABC is divided into six smaller triangles by lines drawn from the vertices through a common interior point. The areas of four of 6 triangles are as indicated, then the area of ΔABC is ......
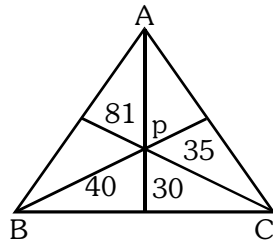
(1) 238   (2) 464   (3) 315   (4) 412

Ans. (3)

Sol. Let a & b be the area of ΔAPM and ΔBPN respectively

Then,

$\Rightarrow$ $\dfrac{\text{area}(\Delta BPL)}{\text{area}(\Delta PLC)} = \dfrac{\text{ar}(\Delta ABL)}{\text{ar}(\Delta ALC)}$

$\dfrac{40}{30} = \dfrac{84 + b + 40}{a + 35 + 30}$ .... (1)

Also,

$\dfrac{\text{ar}(\Delta CPM)}{\text{ar}(\Delta APM)} = \dfrac{\text{ar}(\Delta BCM)}{\text{ar}(\Delta ABM)}$

$\Rightarrow$ $\dfrac{35}{a} = \dfrac{40 + 30 + 35}{a + b + 84}$ .... (2)

from (1) and (2), we get

a = 56 and b = 70

$\therefore$ $\boxed{\text{ar}(\Delta ABC) = 315}$
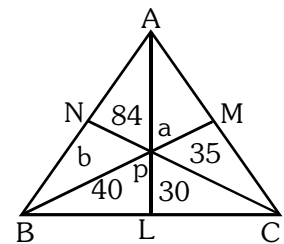
152. ABC is a right angled with $\angle B = 90°$, m is the midpoint of AC and B m = $\sqrt{177}$ cm, AB + BC = 30 then the area of the triangle is ....

(1) 108 cm²   (2) 248 cm²   (3) 316 cm²   (4) 156 cm²

Ans. (1)

Sol. Given,

BM = $\sqrt{117}$ and AB + BC = 30

Here,

$\therefore$ AC = AM + CM = $2\sqrt{117}$

Now,

$\qquad AB^2 + BC^2 = AC^2$

$\Rightarrow (AB + BC)^2 - 2AB.BC = 4 \times 117$

$\Rightarrow 900 - 2AB.BC = 468$

$\Rightarrow 2AB.BC = 432$

$\Rightarrow AB(30 - AB) = 216$

$\Rightarrow AB^2 - 18AB - 12AB + 216 = 0$

$\Rightarrow (AB - 18)(AB - 12) = 0$

$\Rightarrow AB = 12, 18$

$\therefore$ BC = 18, 12

So, ar(ΔABC) = $\dfrac{1}{2} \times 12 \times 18$ = 108 cm²
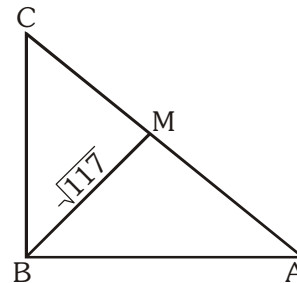
153. Let p be an interior point of ΔABC and extend lines from the vertices through p to the opposite sides. Let a, b, c and d divides the lengths of the segments indicated in the figure. Find the product of abc, if a + b + c = 43 and d = 3.
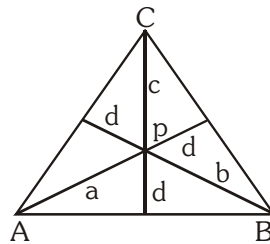
(1) 168   (2) 256   (3) 346   (4) 441

Ans. (4)

Sol. Call the cevians AD, AE, and CF. Using area ratios (ΔPBC and ΔABC have the same base), we have :

$\dfrac{d}{a + d} = \dfrac{[PBC]}{[ABC]}$

Similarily, $\dfrac{d}{b + d} = \dfrac{[PCA]}{[ABC]}$ and $\dfrac{d}{c + d} = \dfrac{[PAB]}{[ABC]}$

Then,

$\dfrac{d}{a + d} + \dfrac{d}{b + d} + \dfrac{d}{c + d} \dfrac{[PBC]}{[ABC]} + \dfrac{[PCA]}{[ABC]} + \dfrac{[PAB]}{[ABC]} = \dfrac{[ABC]}{[ABC]} = 1$

The identity $\dfrac{d}{a + d} + \dfrac{d}{b + d} + \dfrac{d}{c + d} = 1$ is a form of Ceva's Theorem.

Plugging in d = 3, we get

$\dfrac{3}{a + 3} + \dfrac{3}{b + 3} + \dfrac{3}{c + 3} = 1$

$3[(a + 3)(b + 3) + (b + 3)(c + 3) + (c + 3)(a + 3)] = (a + 3)(b + 3)(c + 3)$

$3(ab + bc + ca) + 18(a + b + c) + 81 = abc + 3(ab + bc + ca) + 9(a + b + c) + 27$

$9(a + b + c) + 54 = abc = \boxed{441}$

154. As shown in the figure in ΔABC, p is an interior point. Through the point p, three lines are drawn parallel to three sides as shown in the figure. If the areas of smaller triangles are 16, 25 and 36 square units respectively, then the area of ΔABC in square units is
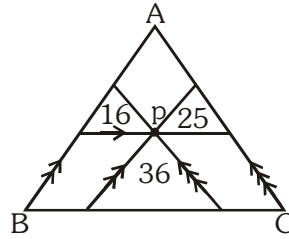
(1) 324   (2) 196   (3) 225   (4) 784

Ans. (3)

Sol. Let A_1, A_2, A_3 be the three triangles with area 16, 25, 36 respectively

Now, triangles A_1, A_2, A_3 and ΔABC are similar triangles.

So, ar(ΔABC) = $(4 + 6 + 5)^2$

= $(15)^2$

= 225 cm^2
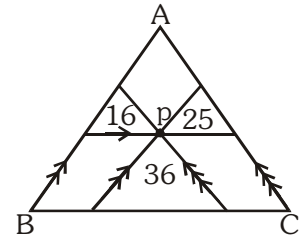
155. In an equailateral triangle ABC, the side BC is trisected at D, then $9AD^2$ is ...

(1) $7AB^2$ (2) $8BC^2$ (3) $4AC^2$ (4) $\dfrac{3}{2}AB^2$

Ans. (1)

Sol. $\Rightarrow 9AD^2$

$\Rightarrow 9[AE^2 + DE^2]$

$\Rightarrow 9\left[\left(\dfrac{\sqrt{3}}{2}a\right)^2 + \left(\dfrac{a}{6}\right)^2\right]$

$\Rightarrow 9\left(\dfrac{3a^2}{4} + \dfrac{a^2}{36}\right)$

$\Rightarrow 9\left(\dfrac{27a^2 + a^2}{36}\right)$

$\Rightarrow 7a^2$

$\Rightarrow 7AB^2$
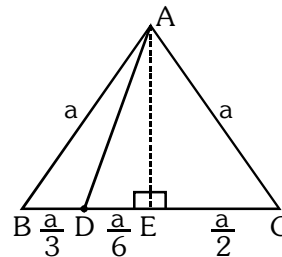
156. In the given figure, AB is the diameter of a circle with O and AT is a tangent. If ∠AOQ = 58°, then the value of ∠ATQ is ....
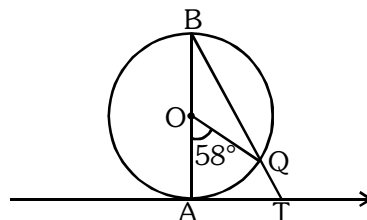
(1) 52°   (2) 61°   (3) 46°   (4) 75°

Ans. (2)

Sol. ∠AOT = 58°

∴ ∠ABT = 29°

In ΔABT, ∠ABT + ∠BTA + ∠TAB = 180°

29° + ∠BTA + 90° = 180°

∠BTA = 61°

∴ ∠ATQ = 61°

157. The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3, then the ratio of their volumes is ..

(1) 15 : 16   (2) 14 : 17   (3) 20 : 27   (4) 4 : 9

Ans. (3)

Sol. $\dfrac{V_1}{V_2} = \dfrac{\pi r_1^2 h_1}{\pi r_2^2 h_2} = \left(\dfrac{r_1}{r_2}\right)^2 \dfrac{h_1}{h_2} = \left(\dfrac{2}{3}\right)^2 \dfrac{5}{3} = \dfrac{20}{27}$

158. If the area of three adjacent faces of a cuboid are x, y and z respectively, then the volume of a cuboid is .....

(1) $\sqrt{xyz}$ (2) x + y + z   (3) $x^2 yz$ (4) xy + z

Ans. (1)

Sol. $\ell b = x$ .... (1)

$bh = y$ ...... (2)

$h\ell = z$ ....(3)

Multiplying equation (1), (2) and (3),

$(\ell bh)^2 = xyz$

$V^2 = xyz$

$V = \sqrt{xyz}$

159. If $\tan\theta + \cot\theta = 2$, then the value of $\tan^2\theta + \cot^2\theta$ is ...

(1) 4   (2) 2   (3) $\dfrac{3}{2}$ (4) 5

Ans. (2)

Sol. $\tan\theta + \cot\theta = 2$

$\tan^2\theta + \cot^2\theta + 2.\tan\theta.\cot\theta = 4$

$\tan^2\theta + \cot^2\theta = 2$

160. A bag contains 15 balls of which x are black and remaining are red. If the number of red balls are increased by 5, the probability of drawing the red balls doubles, then the probability of drawing red ball is .....

(1) $\dfrac{1}{5}$ (2) $\dfrac{4}{5}$ (3) $\dfrac{3}{5}$ (4) $\dfrac{2}{5}$

Ans. (1)

Sol. Let the number of black balls be x

∴ Number of red balls = 15 – x

$2\left(\dfrac{15-x}{15}\right) = \dfrac{20-x}{20}$

$\Rightarrow x = 12$

then number of red balls = 15 – 12 = 3

Probability (red ball) = $\dfrac{3}{15} = \dfrac{1}{5}$

161. "On the basis of iron, coal and textiles, Britain built up a type of civilisation which has been copied all round the world." Who said these words praising Britain ?

(1) Fisher   (2) James Watt   (3) Henry Fort   (4) Friedrich Engels

Ans. (1)

Sol. Fisher used these words to praise Britain.

162. "Which no European power would be allowed to build colonies in the American continents and US will not interfere in the affairs of Europe or colonies in other continents." Name the American President who declared this.

(1) James Monroe   (2) Franklin Roosevelt   (3) Harry S. Truman   (4) George W. Bush

Ans. (1)

Sol. James Monroe declared the quote given in the question.

163. Find the wrong statement about Cricket.

(1) The first written laws of Cricket were drawn up in 1744.

(2) The stumps must be 22 inches high and the bail across them six inches.

(3) The world's first Cricket Club was formed in Hambledon in the 1760's:

(4) The Sikhs founded the first ' Indian Cricket Club, the Punjab Club in Amritsar in 1820.

Ans. (4)

Sol. The Parsis founded the first Indian cricket club not the Sikhs.

164. What is the reason for increase in industrialisation in Germany after 1870 ? .

(1) Invention of Dynamo by Werner Siemens.

(2) Unification of Germany.

(3) Capturing of Loraine from France by Germany.

(4) All the above.

Ans. (3)

Sol. The capturing of Loraine from France increased the industrialization in Germany after 1870.

165. Find out the one, which is not related to French Revolution.

(1) Estate General Meeting in 1789.   (2) Destroy of Bastille Fort.

(3) Tennis Court Oath.   (4) Glorious Revolution.

Ans. (4)

Sol. Glorious revolution is related with Britain not with France.

166. Which of the following is not the result of the Treaty of Vienna of 1815?

(1) France lost the territories it had annexed under Napoleon.

(2) Poland was given to Prussia.

(3) Prussia was handed over to England.

(4) None of the above.

Ans. (3)

Sol. Prussia was not handed over to England after Treaty of Vienna 1815.

167. Hearing about this incident, Mahatma Gandhi called a halt to the Non-Cooperation movement.

(1) Chauri Chaura incident   (2) Jalian Wala Bagh incident

(3) Awadh incident   (4) Forest Revolt in Kumaon

Ans. (1)

Sol. Mahatma Gandhi called off Non Cooperation movement because of the violent Chauri Chaura incident.

168. Name the Viceroy of India during Civil Disobedience Movement.

(1) Lord Linlithgow   (2) Lord Irwin   (3) Lord Reading   (4) Lord Chelmsford

Ans. (2)

Sol. Lord Irwin was the Viceroy of India during the Civil Disobedience Movement.

169. In which year, did Gandhiji relaunch Civil Disobedience Movement?

    (1) 1931   (2) 1932   (3) 1933   (4) 1934

Ans. **(2)**

Sol. Gandhiji re-launched the Civil Disobedience Movement in 1932

170. Which of these is not a demand of Vladimir Lenin in April Theses?

    (1) Land to be transferred to the peasants.   (2) Nationalisation of factories and banks.

    (3) War be brought to a close.   (4) Transfer of political power to middle class

Ans. **(4)**

Sol. Transfer of political power to middle class was not a demand of Lenin in his April Thesis.

171. Who wrote about the injustices of the Caste system in his "Gulamgiri"?

    (1) E.V Ramaswamy Naikar   (2) Kashi baba

    (3) Jyotiba Phule   (4) B.R Ambedkar

Ans. **(3)**

Sol. The famous book Gulamgiri was written by Jyotiba Phule.

172. Who is the author of the novel "The Jungle Book"?

    (1) R.L Stevenson   (2) Charles Dickens

    (3) Thomas Hardy   (4) Rudyard Kipling

Ans. **(4)**

Sol. Rudyard Kipling is the author of 'Jungle Book'.

173. In which congress session, the resolution of Purna Swaraj was passed?

    (1) Lahore session   (2) Karachi session   (3) Nagpur session   (4) Wardha session

Ans. **(1)**

Sol. The resolution of Poorna Swaraj was passed in Lahore Session of Indian Congress.

174. On 15th August 1947, in which place to reduce the riots?

    (1) Noakhali   (2) Satara   (3) Nawadwip   (4) Jalandhar

Ans. **(1)**

Sol. On 15th August 1947, Gandhi was in Noakhali trying to bring peace to reduce riots.

175. Which party gave its support to the Britishers during Second World War?

    (1) Congress   (2) Muslim league

    (3) Communist party of India   (4) All the above.

Ans. **(2)**

Sol. Muslim League supported the British during the Second World War.

176. Match the list A with B and select the answer using the codes given below the list:

	A		B
A	Kankar	I	Small streams disappear
B	Khader	II	Contains calcareous deposits
C	Bhaber	III	Ideal for intensive agriculture
D	Terai	IV	Thickly forested region full of wild life

    (1) i-a, iii-b,iv-c,ii,d   (2) ii-a, iv-b,iii-c,i,d   (3) ii-a, iii-b,i-c,iv,d   (4) iii-a, iii-b,i-c,iv,d

Ans. **(3)**

Sol. Kankar : Contains calcareous deposits

    Khader :Ideal for intensive agriculture

    Bhaber: Small streams disappear

    Terai : Thickly forested region full of wild life

177. The time at 20° West longitude is 2.00 AM. Then what is the time at 90° East longitudes?

(1) 6.40 AM   (2) 9.20 AM   (3) 8.40 AM   (4) 10.20 AM

Ans. (2)

Sol. If the time at 20 degree West longitude is 2:00 AM then it will be 9:20 AM at 90 degree East longitude.

178. Which of the following Indus tributaries does not join Kashmir region?

(1) Zaskar   (2) Jhelum   (3) Shyok   (4) Nubra

Ans. (4)

Sol. Nubra is the tributary that does not join the Indus River in the Kashmir region.

179. Consider the following Statement.

(1) The amount of annual rainfall in the northern plains of India decreases from east to west.

(2) The Coromandel Coast receives winter rainfall

(3) The delta region of the eastern coast is frequently strucked with cyclones

(4) The speed of Jet Streams increases during winter

Which of the statement given above is/are correct?

(1) a only   (2) a,b,c   (3) b,c,d   (4) a,b,c,d

Ans. (4)

Sol. All four statements are correct with respect to the climate of India.

180. Name the Indian forests containing upper canopy .

(1) Tropical deciduous forests   (2) Mangrove forest

(3) Tropical evergreen forests   (4) Thorny forest

Ans. (3)

Sol. Tropical Evergreen Forests contains upper canopy.

181. Identify the pull factor that is not related to migrations.

(1) Better living conditions   (2) Employment opportunities

(3) Medical facilities   (4) None of the above

Ans. (4)

Sol. Given are not related to the pull factor of migration.

182. The famous hill station udgamandalam, popularly known as Ooty, is located in the …..

(1) Nilgiris   (2) Palani hills   (3) Anaimalai hills   (4) Cardamom hills

Ans. (1)

Sol. The famous hill station Ooty is situated in Nilgiris.

183. What is the reasons for the Troposphere to be at a greater height at the Equator ?

(1) Conventional Current   (2) Conduction

(3) Terrestrial radiation   (4) All the above

Ans. (3)

Sol. The Troposphere is at greater height at equator due to Terrestrial radiation.

184. Name the Planetary winds that meet the Inter Tropical Convergence Zone.

(1) Westerlies and Easterlies

(2) North east trade winds, South east trade winds

(3) South east trade winds, Westerlies

(4) Trade winds, Easterlies

Ans. (2)

Sol. The North East trade wind and South east trade winds converged at ITCZ.

185. East , west corridor does not pass through ....

    (1) Udaipur   (2) Jhansi   (3) Guwahati   (4) Gurgaon

Ans. (4)

Sol. The East-West Corridor does not pass through Gurgaon.

186. Magnetite is the ....

    (1) Highest quality coal   (2) Finest iron ore

    (3) Finest copper ore   (4) Highest quality limestone

Ans. (2)

Sol. Magnetite is the finest iron ore.

187. Which of the following is not correctly related to Jowar?

    (1) Jowar is a Karif crop

    (2) Jowar is the third most important food crop with respect to area and production

    (3) Maharashtra is the largest producer of Jowar

    (4) None of the above

Ans. (4)

Sol. All the statements are correctly related to the Jowar.

188. North eastern states are mostly covered with this soil.

    (1) Red and yellow soil   (2) Alluvial Soil

    (3) Forest and mountainous soils   (4) Laterite soils

Ans. (1)

Sol. North eastern states of India are mostly covered with red and yellow soil.

189. Find out the wrong one about National Parks.

    (1) Gir National Park - Gujarat   (2) Simlipal National Park- Odisha

    (3) Sanjay Gandhi National Park- Uttar Pradesh   (4) Guindi National Park- Tamilnadu

Ans. (3)

Sol. Sanjay Gandhi National Park is situated in Maharashtra.

190. Name the longest range in Himachal ranges ?

    (1) Mahabharath range   (2) Pir Panjal range   (3) Dhrula Dhar range   (4) Nagatiba range

Ans. (2)

Sol. Pir Panjal range is the longest among all the Himachal ranges.

191. Which of the following freedom is not available to Indian citizens?

    (1) Freedom to assemble peacefully without arms.

    (2) Freedom to move freely.

    (3) Freedom to resides and settle in any part of the territory of India

    (4) None of the above

Ans. (3)

Sol. Freedom to reside and settle in any part of the territory of India is not available to Indian citizens.

192. Find the wrong statements.

    (1) There was unanimity of opinions on all provisions during constitutions assembly

    (2) The makers of Constitution represented all regions of the country

    (3) Constitution provides certain provisions to amend articles in it

    (4) Supreme Court of India has said basic features of constitution may also be amended.

Ans. (4)

Sol. 4 is incorrect as basic features of Indian Constitution cannot be amended in any case.

193. As Per census 2001, what is the percentage of people with Hindi as their mother tongue?

(1) 41.03% (2) 52.02% (3) 32.14% (4) 64.91 %

Ans. (1)

Sol. As per the census 2001, 41.03% percent people recognized Hindi as their mother tongue.

194. Which Lok Sabha elections recorded heavy voting's ?

(1) 10th Lok Sabha elections (2) 12th Lok Sabha elections

3) 14th Lok Sabha elections (4) 16th Lok Sabha elections

Ans. (4)

Sol. The 16th Lok Sabha Election recorded the heaviest voting in Indian electoral history.

195. Which of the following subjects is nor under concurrent list?

(1) Adoption (2) Trade Union (3) Commerce (4) Succession

Ans. (3)

Sol. Commerce is the subject that is not under Concurrent List.

196. Largest income under direct taxes is obtained from …....

(1) Income tax (2) Corporation tax (3) Gift tax (4) Custom Duty

Ans. (1)

Sol. Largest income under direct taxes is obtained from Income Tax.

197. Which of the following statement is wrong about organised sector?

(1) People who work in the government or with companies or large establishment are all in organised sector

(2) They get paid leave payment during holidays provident fund etc.

(3) Workers in the organised sector enjoys security of employment

(4) 92 % of workers in India are found in organised sector

Ans. (4)

Sol. Statement 4 is not correct regarding the organize sector in India.

198. Find out the wrong statement about Ford Motors

(1) Ford Motors is the largest automobile manufacturers which belongs to America

(2) It came to India in 1995 and established a plant near Chennai

(3) The plant near Chennai was established in collaboration with Ashok Leyland

(4) None of the above

Ans. (3)

Sol. The plant of Ford Motors near Chennai was not established in collaboration with Ashok Leyland.

199. Find out the correct statement regarding Mid-Day Meal Scheme.

a) This is the largest school feeding programme in the world

b) About 14 crore children studying in schools ,eat mid-day meal today .

c) The Supreme Court ruled that prefernces be given to dalit cooks , widows and destitute women

d) The schemes was first implemented in Tamil Nadu

(1) a,b,c (2) b,c,d, (3) a,c,d, (4) a,b,c,d

Ans. (4)

Sol. All four statements are correct regarding Mid Day Meal Scheme.

200. The most common route for investments by MNC's in countries around the world, is to

(1) Establish new factories

(2) Buy existing local companies

(3) Form partnership with local companies

(4) Giving loans to the government

Ans. (2)

Sol. The most common route for investment by MNC's in countries around the world is to buy existing local companies.