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

101. Opposition of flow of electric current is called

(1) Potential difference

(2) Electric charge

(3) Resistance

(4) Electromagnetic induction

Ans. (3)

Sol. Resistance is property of conductor which oppose the flow of current.

102. Which of these does not require a medium?

(1) Conduction   (2) Convection   (3) Radiation   (4) None of these

Ans. (3)

Sol. Radiation (since both above methods require medium).

103. Capacity of a measuring flask is 1 litre. What it will be in cubic centimetre

(1) 1 Cubic centimetre

(2) 10 Cubic centimetre

(3) 100 Cubic Centimetre

(4) 1000 Cubic Centimetre

Ans. (4)

Sol. 1000 cubic centimeter

1 litre = 1000 cm^3

104. Noise is produced by

(1) Vibration with high frequency

(2) Regular vibration

(3) Regular and periodic vibration

(4) Irregular and non periodic vibration

Ans. (4) irregular and non periodic vibration.

Sol. Smooth and periodic vibration is music and irregular and non-periodic vibration is noise.

105. A ray passing through which part of a lens emerges undeviated ?

(1) Focus

(2) Centre of curvature

(3) Optical centre

(4) Between focus and centre of curvature

Ans. (3)

Sol. As ray falls normally on it.

106. To convert temperature in °F into °C we use the formula

(1) $\dfrac{F}{100} = \dfrac{C-32}{180}$ (2) $C = \dfrac{5}{9}(F-32)$ (3) $F = \dfrac{5}{9}(C-32)$ (4) $C = \dfrac{9}{5}(F-32)$

Ans. (2)

Sol. $\dfrac{C-0}{100} = \dfrac{F-32}{180}$

$\dfrac{C}{5} = \dfrac{F-32}{9}$

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

107. A swimming pool appears less deeper than its real depth

(1) due to reflection

(2) due to refraction
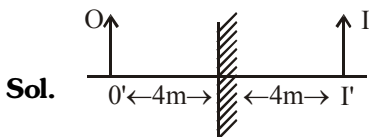
(3) due to dispersion

(4) Due to lateral displacement

Ans. (2)

Sol. Due to the bending of light ray, when it enters from one medium to another.

108. A person is standing 4 m away from plane mirror. Distance between mirror and image is

(1) 4 metre   (2) 8 metre   (3) 2 metre   (4) 6 metre

Ans. (1)

Sol.

O↑   ↑ I

0'←4m→ ←4m→ I'

So the distance between mirror and image is 4m.

109. According to law of floatation weight of a floating body is-

(1) Equal to the weight of liquid displaced

(2) Equal to the volume of liquid displaced

(3) Is greater than the weight of liquid displaced

(4) Is less than the weight of liquid displaced

Ans. (1)

Sol. According to Archimedes principle, weight of a body in water or liquid is equal to the weight of the liquid displaced by it.

110. Two resistance each of 2 ohm are connected in series and in parellel separately. Equivalent resistance is –

(1) $4\Omega, 1\Omega$ (2) $1\Omega, 4\Omega$ (3) $2\Omega, 2\Omega$ (4) $4\Omega, 4\Omega$

Ans. (1)

Sol. When resistance in series

$R_{eq} = R_1 + R_2 = 2 + 2$

Equivalent resistance = 4Ω

When resistance in parallel

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

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

$$\frac{1}{R_{eq}} = \frac{2}{2}$$

$R_{eq} = 1\Omega$

111. Time period of second's needle of clock -

(1) 1 Minute   (2) 1 Hour   (3) 12 Hour   (4) 24 Hour

Ans. (1)

Sol. Second's needle take 60 seconds or 1 minute to complete one cycle so time period of the needle is 1 minute.

112. If an object is placed between two plane mirror, how many images will be formed-

(1) Only one   (2) Two   (3) Infinite   (4) None of these

Ans. (3)

Sol. $n = \dfrac{360}{\theta} - 1$

as $\theta = 0$

$n = \dfrac{360}{0} - 1 = \infty - 1 = \infty$

So number of image are infinite.

113. In long sightedness image is formed-

(1) On Retina   (2) Infront of Retina   (3) Behind Retina   (4) On blind spot

Ans. (3)

Sol. In long sightedness eyes ball's size decrease or focal length of the lens increase due to which image will form behind in the retina.

114. Unsaturated hydrocarbon among the following is-

(1) Ethane   (2) Methane   (3) Ethylene   (4) Propane

Ans. (3)

Sol. Ethylene is common name of ethene (C_2H_4) which is an unsaturated hydrocarbon.

115. Nature of oxides of non-metal is -

(1) Acidic   (2) Basic   (3) Amphoteric   (4) Neutral

Ans. (1)

Sol. Non metallic oxides are generally acidic in nature.

116. Stainless steel is an alloy in which following is added along with iron-

(1) Zinc   (2) Chromium   (3) Tin   (4) Cupper

Ans. (2)

Sol. Iron, carbon, nickel and chromium together form alloy of stainless steel.

117. Which among the following coal contains highest % of Carbon -

(1) Peat   (2) Bituminous   (3) Anthracite   (4) Lignite

Ans. (3)

Sol. Anthracite contains highest % of carbon.

118. Most reactive metal is

(1) Na   (2) Mg   (3) Cu   (4) Au

Ans. (1)

Sol. According to reactivity series, sodium is the most reactive metal.

119. Zinc and HCl react to form

(1) H_2 (2) N_2 (3) CO_2 (4) He

Ans. (1)

Sol. Metals react with acids to form salt and hydrogen gas

120. Which among the following non metal is liquid at room temperature ?

(1) Chlorine   (2) Bromine   (3) Mercury   (4) Phosphorus

Ans. (2)

Sol. Bromine

121. Which metal forms hydrogen gas when reacts with cold water ?

(1) Na   (2) Mg   (3) Fe   (4) Zn

Ans. (1)

Sol. Sodium reacts with cold water as it is a very reactive metal.

122. Thermosetting plastic is

(1) Polythene   (2) PVC   (3) Bakelite   (4) Polypropene

Ans. (3)

Sol. Bakelite

123. Lens of Spectacles are made from

(1) Soft Glass   (2) Hard Glass   (3) Pyrex Glass   (4) Flint Glass

Ans. (4)

Sol. Flint glass

124. The reaction that take place in nuclear reactor is

(1) Nuclear fusion   (2) Nuclear fission

(3) Controlled nuclear fission   (4) Double decomposition

Ans. (3)

Sol. Controlled nuclear fission

125. Renewable source of energy is

(1) Coal   (2) Petroleum

(3) Natural gas   (4) Energy of flowing water

Ans. (4)

Sol. Energy of flowing water

126. Calcium carbide when reacts with water gives

(1) Methane gas   (2) Ethane gas

(3) Ethylene gas   (4) Ethyne gas

Ans. (4)

Sol. Ethyne gas, $CaC_2(s) + 2H_2O\ (l) \longrightarrow C_2H_2(g) + Ca(OH)_2(aq)$

127. What type of colloidal system is fog ?

(1) Gas in liquid   (2) Liquid in gas   (3) Liquid in liquid   (4) Solid in gas

Ans. (2)

Sol. In Fog, liquid is dispersed phase and gas is dispersion medium.

BIOLOGY

128. Which of these is not a viral disease ?

(1) Measles   (2) Rabies   (3) Polio   (4) Tuberculosis

Ans. (4)

Sol. Measles, Rabies and Polio are viral diseases but tuberculosis is a bacterial disease.

129. Marasmus occurs due to

(1) Protein deficiency   (2) Carbohydrate deficiency

(3) Fat deficiency   (4) None of these

Ans. (1)

Sol. Marasmus is caused by a severe deficiency of proteins.

130. 'Sonalika' is a variety of

(1) Rice   (2) Wheat   (3) Maize   (4) Bajra

Ans. (2)

Sol. Sonalika is developed from high yielding, semi dwarf, fertilizer responsive wheat variety. Sonalika is not an Indian wheat variety.

131. Blood cell without nucleus are

(1) Red blood corpuscles   (2) White blood corpuscles

(3) Blood platelets   (4) None of these

Ans. (1)

Sol. Mature Red blood corpuscles do not contain nucleus.

132. Which of the following conclusion is related to Lamarck ?

(1) Survival of the fittest   (2) Inheritance of acquired character

(3) Struggle for existence   (4) Origin of species by natural selection

Ans. (2)

Sol. Lamarck theory for evolution involved the inheritance of acquired traits. He believed that traits changed or acquired over an individual's lifetime could be passed to offspring.

133. Enzyme which is absent in pancreatic juice

(1) Amylase   (2) Lipase   (3) Pepsin   (4) Trypsin

Ans. (3)

Sol. Pancreatic juice is a liquid secreted by the pancreas, which contains a variety of enzymes, including trypsin, pancreatic amylase and pancreatic lipase. Pepsin is secreted by gastric glands present in stomach.

134. Chemical used for preservating Jam and Jelly is

(1) Sodium Chloride   (2) Acetic acid

(3) Citric acid   (4) Sodium Benzoate

Ans. (4)

Sol. Chemical used for preservating jam and jelly is Sodium Benzoate.

135. Retinol is a common name of

(1) Vit. A   (2) Vit B_1 (3) Vit. B_2 (4) Vit C.

Ans. (1)

Sol. Retinol is a common name of Vit. A.

136. Base which is absent in R.N.A -

(1) Guanine   (2) Adenine   (3) Uracil   (4) Thiamine

Ans. (4)

Sol. In DNA Nitrogenous base are Adenine, Guanine, Cytosine and Thymine but in RNA instead of Thymine, Uracil is present.

137. In maize plant the type of pollination is -

(1) Self Pollination   (2) Pollination by air   (3) Pollination by water   (4) Pollination by insects

Ans. (2)

Sol. Maize is monocot plant and belongs to family Graminae. It has light and fluffy pollen which pollinate by wind.

138. Most primitive mammal is -

(1) BAT   (2) Rat   (3) Platypus   (4) Kangaroo

Ans. (3)

Sol. There are three living genera of primitive mammals from Australia classified as Monotremes- the Duck billed platypus and 2 genera of Echidna.

139. Which of the following is not a true fish ?

(1) Silverfish　　　(2) Sea horse　　　(3) Flying fish　　　(4) Eel

Ans. **(1)**

Sol. Silver fish is an insect.

140. B.C.G. is a vaccine for which disease ?

(1) Cholera　　　(2) Measles　　　(3) Tetanus　　　(4) Tuberculosis

Ans. **(4)**

Sol. Bacillus Calmette Guerin vaccine is a vaccine primarily used against tuberculosis. In countries where tuberculosis is common one dose is recommended in healthy babies as close to the time of birth as possible.

141. In the early Rigvedic period, what was considered to be the most valuable property-

(1) Land　　　(2) Cow　　　(3) Grains　　　(4) Water

Ans. **(2)**

Sol. In the early Rigvedic period, cow was considered to be the most valuable property.

142. The Rath temples at Mahaballipuram were built by-

(1) Cholas　　　(2) Pallavas　　　(3) Chedis　　　(4) Chalukys

Ans. **(2)**

Sol. Pallavas built the Ratha temples at Mahabalipuram.

143. Who was the ruler of 'Vatsa' during the time of Buddha?

(1) Bodhi　　　(2) Udayana　　　(3) Satanika　　　(4) Nichakshu

Ans. **(2)**

Sol. Ruler of Vatsa was Udayana at the time of Buddha.

144. Who among the following called himself the 'Parrot of India'-

(1) Amir Hasan　　　(2) Jaisi　　　(3) Amir Khusrau　　　(4) Faizi

Ans. **(3)**

Sol. Amir Khusrau was sometimes known as "the Parrot of India".

145. The famous book "Geet Govind" is written by -

(1) Jayadev　　　(2) Mahadevi Verma　　　(3) Jaishankar Prasad　　　(4) Kalidas

Ans. **(1)**

Sol. Geet Govind was written by Jayadeva.

146. The birth place of Maharani Laxmibai is situated at -

(1) Varanasi　　　(2) Kanpur　　　(3) Allahabad　　　(4) Gwalior

Ans. **(1)**

Sol. Maharani Lakshmibai (Manikarnika) was born in Varanasi.

147. Who among the following emperors was called 'Qalandar'–

(1) Akbar　　　(2) Jahangir　　　(3) Shahjahan　　　(4) Babur

Ans. **(4)**

Sol. Babur was known as Qalandar for his honesty.

148. Who among the following were the ones to bring a printing press in India—

(1) Dutch　　　(2) British　　　(3) Portuguese　　　(4) French

Ans. **(3)**

Sol. Portuguese brought the first printing press to India.

149. Who was the leader of 1857 Revolt in Lucknow-

(1) Zeenat Mahal   (2) NanaSahab   (3) Hazrat Mahal   (4) TantyaTope

Ans. (3)

Sol. Begum Hazrat led the revolt of 1857 at Lucknow.

150. What was 'Kamagatamaru'–

(1) A ship   (2) An Industrial centre   (3) A harbour   (4) An army unit

Ans. (1)

Sol. Kamagatamaru was a Ship carrying 370 passengers, that was going from Singapore to Canada, but was turned back by Canadian authorities in the year 1914.

151. India House in London was established by–

(1) Shyam Ji Krishna Verma   (2) Bartullah

(3) Virendranath Chattopadheyay   (4) Lala Hardayal

Ans. (1)

Sol. Shyam Ji Krishna Verma established the India House at London.

152. Who is famous as 'Deenbandhu'–

(1) Vinoba Bhave   (2) C. F.Andrewz   (3) A. O. Hume   (4) VeerSavarkar

Ans. (2)

Sol. C.F Andrews , a close associate of Mahatma Gandhi was popularly known as 'Deenbandhu' .

153. 'Anand Math' was composed by–

(1) Bankim Chandra Chatterjee   (2) Mahatma Gandhi

(3) Swami Dayanand Saraswati   (4) Ram Krishna Paramhans

Ans. (1)

Sol. Anand Math was composed by Bankim Chandra Chatterji.

154. Who wrote 'Akbarnama'–

(1) Abdur Rahim Khankhana   (2) Faizi

(3) Abdul Quadir Badauni   (4) Abul FazI

Ans. (4)

Sol. Abul Fazl wrote the biography of Akbar 'Akbarnama'.

155. Which one of the following is not correctly matched–

(1) Blue revolution - fish production

(2) Yellow revolution- oil seeds production

(3) White revolution-thermal power production

(4) Green revolution-food grain production

Ans. (3)

Sol. White Revolution is associated with milk.

156. Nasik is located along the river–

(1) Narmada   (2) Godavari   (3) Penganga   (4) Mahi

Ans. (2)

Sol. Nasik is situated along the banks of Godavari.

157. In which one of the following states the Sun appears the earliest in India–

(1) Mizoram   (2) Assam   (3) Arunachal Pradesh   (4) Nagaland

Ans. (3)

Sol. Sun appears at the earliest in Arunachal Pradesh in India.

158. The highest peak of Indian Peninsula is –

(1) Ootakmund   (2) Anaimudi   (3) Dodabeta   (4) Mahabaleshwar

Ans. **(2)**

Sol. Anaimudi is the highest peak of peninsular India.

159. The capital of Sikkim is-

(1) Agartala   (2) Imphal   (3) Gangtok   (4) Itanagar

Ans. **(3)**

Sol. Sikkim's capital and largest city is Gangtok.

160. The World Population Day is observed on-

(1) 4th October   (2) 31st May   (3) 10th December   (4) 11th July

Ans. **(4)**

Sol. World Population day is an annual event, observed on July 11 every year, which seeks to raise awareness of global population issues.

161. Which one of the following rivers is longest in the world–

(1) Nile   (2) Amazon   (3) Brahmaputra   (4) Mississippi

Ans. **(1)**

Sol. Nile is the longest river in the world.

162. In India the highest production of Jute comes from-

(1) West Bengal   (2) Andhra Pradesh   (3) Maharashtra   (4) Rajasthan

Ans. **(1)**

Sol. West Bengal is the largest Jute producing state of India, second largest producer in Bihar.

163. Where are diamond mines in India-

(1) Karnataka   (2) Madhya Pradesh   (3) Uttar Pradesh   (4) Tamil Nadu

Ans. **(2)**

Sol. India does have one active diamond mine at Panna, in Madhya Pradesh, which is run by the state-owned National Mineral Development Corporation.

164. The largest quantity of saffron is produced in-

(1) Uttar Pradesh   (2) Kashmir   (3) Kerala   (4) Goa

Ans. **(2)**

Sol. Indian State Jammu & Kashmir is the largest producer of Saffron in India and India is the 3rd highest producer of Saffron in World.

165. Which one of the following is caused by the rotation of the earth-

(1) Tides   (2) Change of season   (3) Day and Night   (4) Eclipse

Ans. **(3)**

Sol. The change between day and night is caused by the rotation of the Earth on its axis.

166. Chilika Lake is situated

(1) Punjab   (2) Assam   (3) Tamil Nadu   (4) Odisha

Ans. **(4)**

Sol. Chilika lake is a brackish water lagoon, spread over the Puri, Khurda and Ganjam districts of Odisha state on the east coast of India, at the mouth of the Daya River, flowing into the Bay of Bengal, covering an area of over 1,100 km^2.

167. Which city is dedicated to Lord Shiva–

(1) Mathura   (2) Puri   (3) Ayodhya   (4) Varanasi

Ans. (4)

Sol. Varanasi is a city in the northern Indian state of Uttar Pradesh dating to the 11th century B.C. Regarded as the spiritual capital of India, the city draws Hindu pilgrims who bathe in the Ganges River's sacred waters and perform funeral rites. Along the city's winding streets are some 2,000 temples, including Kashi Vishwanath, the "Golden Temple," dedicated to the Hindu god Shiva.

168. The Headquarters of Reserve Bank of India is in-

(1) Delhi   (2) Mumbai   (3) Nasik   (4) Kanpur

Ans. (2)

Sol. The Reserve Bank of India was established on April 1, 1935 in accordance with the provisions of the Reserve Bank of India Act, 1934. The Central Office of the Reserve Bank was initially established in Calcutta but was permanently moved to Mumbai in 1937.

169. National Dairy Research Institute is established at-

(1) Karnal   (2) Hisar   (3) Anand   (4) Jaipur

Ans. (1)

Sol. The National Dairy Research Institute, Karnal is India's premier institute for dairy research. The institute was accorded the status of Deemed University in the year 1989.

170. Who is the present President of India-

(1) Sri Pranab Mukerjee   (2) Sri Rajnath Singh

(3) Sri Ramnath Kovind   (4) Sri Gopal Krishna Gandhi

Ans. (3)

Sol. The current President is Ram Nath Kovind, elected on 25 July 2017.

171. Which part of the Indian constitution deals with citizenship-

(1) Part IV   (2) Part III   (3) Part I   (4) Part II

Ans. (4)

Sol. Part II of the Indian Constitution deals with Citizenship.

172. Which one of the following is the major feature of the Indian economy-

(1) A capitalist economy   (2) A socialist economy   (3) A mixed economy   (4) None of the above

Ans. (3)

Sol. The Indian Economy is a mixed economy. Mixed economy implies demarcation and harmonization of the public and private sectors.

173. National Voters' day is celebrated on-

(1) 15th January   (2) 25th January   (3) 15th February   (4) 25th February

Ans. (2)

Sol. The National Voters' Day is celebrated every year to mark the foundation day of the Election Commission of India, which was established on 25th January, 1950.

174. Which one of the following Articles of Indian constitution is related to Indian foreign policy-

(1) Article 51   (2) Article 60   (3) Article 50   (4) Article 380

Ans. (1)

Sol. Article 51 of Indian Constitution deals with Indian Foreign Policy.

175. Panchayati Raj is included in the–

(1) Union list   (2) Concurrent List   (3) State List   (4) Residuary List

Ans. (3)

Sol. Panchayati Raj is included in the State List.

176. The tenure of Rajyasabha member is–

(1) 5 years   (2) 6 years   (3) 3 years   (4) 4 years

Ans. (2)

Sol. Tenure of Rajya Sabha member is 6 years.

177. International Institution related to labour welfare is–

(1) UNICEF   (2) I.L.O   (3) F.A.O   (4) C.N.T

Ans. (2)

Sol. International Labour Organisation is the institution of UNO working for the welfare of labour around the world.

178. In which year was the 'Pradhan Awas Yojna' launched–

(1) 2012   (2) 2014   (3) 2015   (4) 2017

Ans. (3)

Sol. Pradhan Mantri Awas Yojna was launched in 2015.

179. Uttarakhand State was created in-

(1) the year 1999   (2) the year 2000   (3) the year 2001   (4) the year 2002

Ans. (2)

Sol. On 9 November 2000, Uttarakhand became the 27th state of the Republic of India, being created from the Himalayan and adjoining northwestern districts of Uttar Pradesh.

180. Who is the author of 'Rebooting India'–

(1) ShivNadar   (2) Sundar Pichai   (3) Nandan Nilekani   (4) Satya Nadel

Ans. (3)

Sol. Nandan Nilekani, co-founder and former CEO of Infosys Technologies is the author of Rebooting India.

181. To make $(x^4 + 4y^4)$ perfect square we have to subtract –

(1) $4xy$ (2) $2y^2x^2$ (3) $2yx$ (4) $4y^2x^2$

Ans. (4)

Sol. To make $x^4 + 4y^4$ as $(a + b)^2$ or $(a - b)^2$ we need to add $4x^2y^2$ or subtract $4x^2y^2$, so according to the question we need to subtract $4x^2y^2$ so, we get

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

182. The perimeter of a right angled triangle is 24 cm. If its hypotenuse is 10 cm then area of this triangle is–

(1) $24\ cm^2$ (2) $10\ cm^2$ (3) $12\ cm^2$ (4) $48\ cm^2$

Ans. (1)

Sol. Perimeter = 24

Sum of other two sides = 24 – 10 = 14

(As 10 is hypotenuse)

So, applying pythagoras theorem, we get

$10^2 = x^2 + (14 - x)^2$

$\Rightarrow 100 = x^2 + 196 + x^2 - 28x$

$\Rightarrow 2x^2 - 28x + 96 = 0$

$\Rightarrow x^2 - 14x + 48 = 0$

$\Rightarrow x^2 - 8x - 6x + 48 = 0$

So, x = 8 or 6

Area = $\frac{1}{2}$ b $\times$ h

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

$= 24\ cm^2$
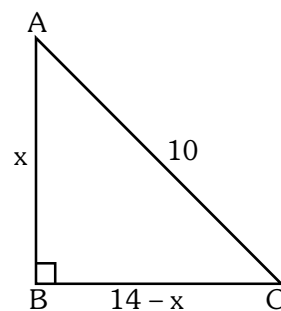
183. Value of $\sqrt{10+\sqrt{25+\sqrt{121}}}$ in the following is –

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

Ans. (3)

Sol. $\sqrt{10+\sqrt{25+\sqrt{121}}}$

$= \sqrt{10+\sqrt{25+11}}$

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

184. If points (1,2), (3,5) and (0, b) are collinear then value of b is-

(1) $\dfrac{1}{2}$ (2) $\dfrac{7}{2}$ (3) 2   (4) –1

Ans. (1)

Sol. Area $= \dfrac{1}{2}$ | 1(5 − b) + 3 (b − 2) + 0(2 − 5) |

As points are collinear, so area = 0

$\therefore \dfrac{1}{2}$ | 1(5 − b) + 3 (b − 2) + 0(2 − 5) | = 0

$\Rightarrow$ 5 − b + 3b − 6 = 0

$\Rightarrow$ 1 = 2b

$\therefore$ b = $\dfrac{1}{2}$

185. A polynomial in the following is–

(1) $7x^2 - 5\sqrt{x} + \sqrt{5}$ (2) $t^3 - 2t + 1$ (3) $x^2 - \dfrac{1}{x^2}$ (4) $\sqrt{y} + 5y - 1$

Ans. (2)

Sol. Degree of variables in polynomials (1), (3) and (4) are not whole numbers, therefore they are not polynomials. While in option (2) degrees of variable are whole numbers, therefore it is a polynomial.

186. If the radii of a cone and a cylinder are in the ratio 2 : 3 and their heights are in the ratio 4 : 3 then the ratio of their volumes will be-

(1) 16 : 27   (2) 16 : 81   (3) 16 : 9   (4) 27 : 16

Ans. (2)

Sol. $\dfrac{r_1}{r_2} = \dfrac{2}{3}, \dfrac{h_1}{h_2} = \dfrac{4}{3}$

$\dfrac{V_{cone}}{V_{cylinder}} = \dfrac{\frac{1}{3}\pi r_1^2 h_1}{\pi r_2^2 h_2} = \dfrac{1}{3} \times \left(\dfrac{r_1}{r_2}\right)^2 \times \left(\dfrac{h_1}{h_2}\right)$

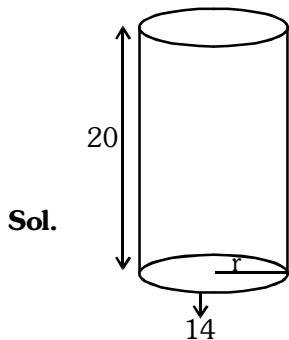$= \dfrac{1}{3} \times \dfrac{4}{9} \times \dfrac{4}{3}$

$= \dfrac{16}{81}$

So ratio = 16 : 81

187. A rectangular piece of paper of length 20 cm and breadth 14 cm is folded about its breadth the curved surface area of the cylinder so formed is–

(1) 180 cm^2 (2) 200 cm^2 (3) 280 cm^2 (4) 190 cm^2

Ans. (3)

Sol.

$2\pi r = 14$

C.S.A. $= 2\pi rh$

$\quad = 14 \times 20$

$\quad = 280 \text{ cm}^2$

188. If an angle is five times its supplementary angle then the angle is–

(1) $75°$ (2) $150°$ (3) $144°$ (4) $40°$

Ans. (2)

Sol. Let the angle be x

Then, $x = 5 \times (180 - x)$

$\Rightarrow 6x = 900$

$\Rightarrow x = 150°$

189. The value of K for which $(x - 1)$ is a factor of the polynomial $x^3 - kx^2 + 11x - 6$ is –

(1) -6 (2) 5 (3) 2 (4) 6

Ans. (4)

Sol. Here $p(x) = x^3 - kx^2 + 11x - 6$

If $(x - 1)$ is a factor, then $p(1) = 0$

$\Rightarrow p(1) = 0$

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

$\Rightarrow 1 - k + 5 = 0$

$\Rightarrow k = 6$

190. If in the given figure 'O' is the centre of the circle, then the value of x is-
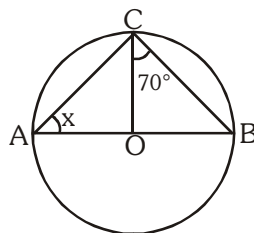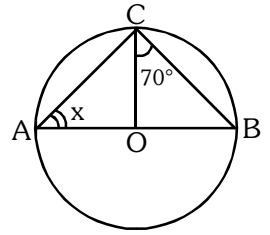

(1) $90°$ (2) $50°$ (3) $20°$ (4) $40°$

Ans. (3)

Sol. Here,

∠OBC = ∠OCB = 70°

(∵ OB = OC = radius of a circle)

Also, ∠ACB = 90° (Angle substended by diameter on circumference of a circle is 90°)

Now, In ΔACB

∠A + ∠C + ∠B = 180°

⇒ x + 90° + 70° = 180°

⇒ x = 20°

191. If ΔABC is an obtuse angled triangle in which ∠C = 110° then which one of the following is true–

(1) AB = AC (2) AB < AC (3) AB > AC (4) AB < BC

Ans. (3)

Sol. Here, ∠C = 110°
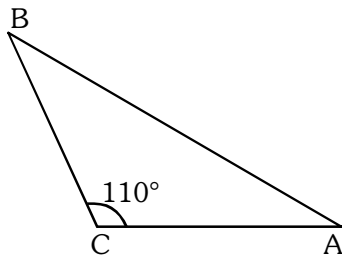
⇒ ∠A and ∠B are acute angles

⇒ ∠C > ∠B

∴ AB > AC

192. The number 50 is divided into two parts such that the sum of their reciprocals is $\dfrac{1}{12}$ then these parts are –

(1) 30 and 20 (2) 10 and 40 (3) 25 and 25 (4) 15 and 35

Ans. (1)

Sol. Let the two parts be x and 50 − x

then, according to the question

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

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

⇒ x(50 − x) = 600

⇒ x^2 − 50x + 600 = 0

⇒ (x − 20) (x − 30) = 0

⇒ x = 20 or 30

Therefore the two parts are 20 and 30.

193. Given 5cosA − 12sinA = 0 evaluate − $\dfrac{sinA + cosA}{2cosA - sinA}$

(1) $\dfrac{19}{17}$ (2) $\dfrac{17}{19}$ (3) $\dfrac{1}{2}$ (4) 1

Ans. (2)

Sol. Here, $5\cos A - 12\sin A = 0$

$$\Rightarrow \tan A = \frac{5}{12}$$

Then, $\dfrac{\sin A + \cos A}{2\cos A - \sin A}$

Dividing N^r and D^r by $\cos A$, we get

$$\frac{\tan A + 1}{2 - \tan A} = \frac{\frac{5}{12} + 1}{2 - \frac{5}{12}} = \frac{17}{19}$$

194. 'x' in the following is $\dfrac{\sqrt{a+x} + \sqrt{a-x}}{\sqrt{a+x} - \sqrt{a-x}} = b$

(1) $\dfrac{2ab}{(b^2+1)}$ (2) $\dfrac{2ab}{a+b}$ (3) $\dfrac{a+b}{2ab}$ (4) $\dfrac{b^2+1}{2ab}$

Ans. (1)

Sol. $\dfrac{\sqrt{a+x} + \sqrt{a-x}}{\sqrt{a+x} - \sqrt{a-x}} = \dfrac{b}{1}$

$$\Rightarrow \frac{\sqrt{a+x}}{\sqrt{a-x}} = \frac{b+1}{b-1} \text{ (By componendo and dividendo)}$$

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

$$\Rightarrow \frac{(a+x)+(a-x)}{(a+x)-(a-x)} = \frac{(b+1)^2 + (b-1)^2}{(b+1)^2 - (b-1)^2} \text{ (By componendo and dividendo)}$$

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

$$\Rightarrow x = \frac{2ab}{b^2+1}$$

195. If $\log_3[\log_4(\log_2 x)] = 0$ then the value of x is -

(1) 16   (2) 8   (3) 64   (4) 32

Ans. (1)

Sol. $\log_3 \log_4 \log_2 x = 0$

$\Rightarrow \log_4 \log_2 x = 3^0 = 1$

$\Rightarrow \log_2 x = 4^1$

$\Rightarrow x = 2^4$

$\Rightarrow x = 16$

196. The present population of a city is 8000 if it increases by 10% during the first year and by 20% during the second year, then population after two years will be –

(1) 12400   (2) 14400   (3) 10560   (4) None of these

Ans. (3)

Sol. Population after two years

$$= 8000 \times \frac{110}{100} \times \frac{120}{100} = 10560$$

197. If $5^p = 7^q = 35^{-r}$ then value of $\dfrac{1}{p} + \dfrac{1}{q} + \dfrac{1}{r}$ is –

(1) 1   (2) –1   (3) 0   (4) $\dfrac{3}{2}$

Ans. (3)

Sol. $5^p = 7^q = 35^{-r} = k$ (say)

$5^p = k \Rightarrow 5 = k^{1/p}$

$7^q = k \Rightarrow 7 = k^{1/q}$

$35^{-r} = k \Rightarrow 35 = k^{-1/r}$

Now

$5 \times 7 = 35$

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

$k^{\frac{1}{p} + \frac{1}{q}} = k^{\frac{-1}{r}}$

$\Rightarrow \dfrac{1}{p} + \dfrac{1}{q} = \dfrac{-1}{r}$

$\Rightarrow \dfrac{1}{p} + \dfrac{1}{q} + \dfrac{1}{r} = 0$

198. The angle of elevation of a cloud from a point 100 metre above the surface of a lake is 30° and the angle of depression of its image in the lake is 60° then height of the cloud above the lake is –

(1) 100 m.   (2) 50 m.   (3) 200 m.   (4) 150 m.

Ans. (3)

Sol. $\tan 30° = \dfrac{h - 100}{d} = \dfrac{1}{\sqrt{3}}$ ...(1)

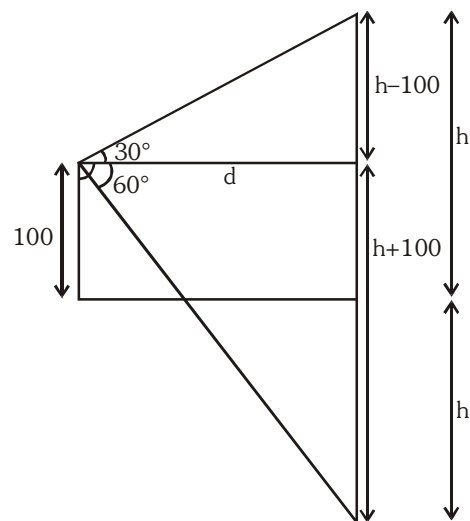$\tan 60° = \dfrac{h + 100}{d} = \sqrt{3}$ ...(2)

Dividing equation (1) by (2) we get

$\dfrac{h - 100}{h + 100} = \dfrac{1}{3}$

$\Rightarrow 3h - 300 = h + 100$

$\Rightarrow 2h = 400$

$h = 200$ metre

∴ Height above the lake = 200 m

199. The mean height of group of 8 students is 152 cm. Two more students of heights 143 cm and 156 cm join the group. The new mean height of the group is –

(1) 151.5 cm   (2) 115 cm   (3) 152 cm   (4) 200 cm

Ans. (1)

Sol. $\dfrac{h_1 + h_2 + \dots + h_8}{8} = 152$

New mean height $= \dfrac{h_1 + h_2 \dots h_8 + 143 + 156}{10}$

$\qquad\qquad\qquad = \dfrac{152 \times 8 + 143 + 156}{10}$

$\qquad\qquad\qquad = \dfrac{1515}{10}$

$\qquad\qquad\qquad = 151.5$ cm

200. If $0.\bar{6} = \dfrac{p}{q}$ where p and q are relatively prime integers, then value of q is-

(1) 10   (2) 3   (3) 1   (4) 9

Ans. (2)

Sol. $0.\bar{6} = \dfrac{6}{9} = \dfrac{2}{3} = \dfrac{p}{q}$

$\Rightarrow q = 3$