PART—B

ARITHMETIC

101. $(0\cdot04)^{-(1\cdot5)}$ is equal to

(A) 25 (B) 125

(C) 60 (D) 5

102. Which term of the sequence 7, 10, 13, ... is 151?

(A) 29th

(B) 19th

(C) 59th

(D) 49th

103. The sum of all the 3-digit numbers, each of which on division by 5 leaves remainder 3, is

(A) 180 (B) 1550

(C) 6995 (D) 99090

104. The sum of the first 20 terms of the series

$$\frac{1}{5\times6}+\frac{1}{6\times7}+\frac{1}{7\times8}+\cdots$$

is

(A) 0·16 (B) 1·6

(C) 16 (D) 0·016

105. Given that $\sqrt{13}=3\cdot6$ and $\sqrt{130}=11\cdot4$, then the value of

$$\sqrt{1\cdot3}+\sqrt{1300}+\sqrt{0\cdot013}$$

is equal to

(A) 36·164 (B) 37·254

(C) 36·254 (D) 37·154

106. The value of

$$\frac{0\cdot125+0\cdot027}{0\cdot25-0\cdot15+0\cdot09}$$

is

(A) 0·2 (B) 0·25

(C) 0·3 (D) 0·8

107. The value of

$$\sqrt[3]{1372}\times\sqrt[3]{1458}\div\sqrt[3]{343}$$

is

(A) 18 (B) 15

(C) 13 (D) 12

108. The HCF and product of two numbers are 15 and 6300 respectively. The number of possible pairs of the numbers is

(A) 4 (B) 3

(C) 2 (D) 1

109. The sum of all the 3-digit numbers is

(A) 98901 (B) 494550

(C) 8991 (D) 899

110. $\sqrt{2+\sqrt{2+\sqrt{2+\cdots}}}$ is equal to

(A) 1·42 (B) 4

(C) 2 (D) 2·414

SPACE FOR ROUGH WORK

111. Given that

$$1+2+3+\cdots+x=\frac{x(x+1)}{2}$$

then $1+3+5+\cdots+99$ is equal to

(A) 2250 (B) 2500

(C) 2525 (D) 3775

112. The value of

$$999\frac{995}{999}\times 999$$

is

(A) 990809 (B) 998996

(C) 999824 (D) 998999

113. The simplified value of

$$\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right)\cdots\left(1-\frac{1}{99}\right)\left(1-\frac{1}{100}\right)$$

is

(A) $\frac{2}{99}$ (B) $\frac{1}{25}$

(C) $\frac{1}{50}$ (D) $\frac{1}{100}$

114. The product of two numbers is 4107. If the HCF of the numbers is 37, the greater number is

(A) 185 (B) 111

(C) 107 (D) 101

115. $\frac{8(3\cdot 75)^3+1}{(7\cdot 5)^2-6\cdot 5}$ is equal to

(A) 2·75 (B) $\frac{9}{5}$

(C) 4·75 (D) 8·5

116. If $p=999$, then the value of

$$\sqrt[3]{p(p^2+3p+3)+1}$$

is

(A) 1000 (B) 999

(C) 998 (D) 1002

117. Which one of the following numbers is ***not*** a square of any natural number?

(A) 17956 (B) 18225

(C) 63592 (D) 53361

118. If $x=1+\sqrt{2}+\sqrt{3}$, then the value of

$$\left(x+\frac{1}{x-1}\right)$$

is

(A) $1+2\sqrt{3}$ (B) $2+\sqrt{3}$

(C) $3+\sqrt{2}$ (D) $2\sqrt{3}-1$

119. What least number must be subtracted from 1936 so that the resulting number when divided by 9, 10 and 15 will leave in each case the same remainder 7?

(A) 37 (B) 36

(C) 39 (D) 30

120. A boy was asked to find $\frac{3}{5}$ of a fraction. Instead, he divided the fraction by $\frac{3}{5}$ and got an answer which exceeded the correct answer by $\frac{32}{75}$. The correct answer is

(A) $\frac{3}{25}$ (B) $\frac{6}{25}$

(C) $\frac{2}{25}$ (D) $\frac{2}{15}$

SPACE FOR ROUGH WORK

121. If $x = 3+\sqrt{8}$, then the value of

$$\left(x^2+\frac{1}{x^2}\right)$$

is

(A) 34

(B) 24

(C) 38

(D) 36

122. The LCM of two numbers is 12 times their HCF. The sum of the HCF and the LCM is 403. If one of the numbers is 93, then the other number is

(A) 124

(B) 128

(C) 134

(D) 138

123. The number, whose square is equal to the difference of the squares of the numbers 68 and 32, is

(A) 36

(B) 48

(C) 60

(D) 64

124. Which term of the sequence 6, 13, 20, 27, ... is 98 more than its 24th term?

(A) 36th

(B) 38th

(C) 35th

(D) 48th

125. $\frac{1}{\sqrt{9}-\sqrt{8}}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{\sqrt{7}-\sqrt{6}}-\frac{1}{\sqrt{6}-\sqrt{5}}+\frac{1}{\sqrt{5}-\sqrt{4}}$ is equal to

(A) 5

(B) 1

(C) 3

(D) 0

126. The value of

$$\frac{(2\cdot697-0\cdot498)^2+(2\cdot697+0\cdot498)^2}{2\cdot697\times2\cdot697+0\cdot498\times0\cdot498}$$

is

(A) 4

(B) 2

(C) 2·199

(D) 3·195

127. How many 3-digit numbers, in all, are divisible by 6?

(A) 140

(B) 150

(C) 160

(D) 170

128. A number, when divided by 899, leaves remainder 63. What will be the remainder if the same number is divided by 29?

(A) 3

(B) 1

(C) 5

(D) 0

SPACE FOR ROUGH WORK

129. By how much does $(\sqrt{12}+\sqrt{18})$ exceed $(2\sqrt{3}+2\sqrt{2})$?
(A) 2
(B) $\sqrt{3}$
(C) $\sqrt{2}$
(D) 3

130. The next number of the sequence

5, 10, 13, 26, 29, 58, 61, ...

is
(A) 122
(B) 120
(C) 93
(D) 64

131. In a certain year, the average monthly income of a person was Rs 3,400. For the first eight months of the year, his average monthly income was Rs 3,160 and for the last five months, it was Rs 4,120. His income in the eighth month of the year was
(A) Rs 3,160
(B) Rs 5,080 –
(C) Rs 15,520
(D) Rs 5,520

132. The average age of 40 students of a class is 18 years. When 20 new students are admitted to the same class, the average age of the students of the class is increased by 6 months. The average age of newly admitted students is
(A) 19 years
(B) 19 years 6 months
(C) 20 years
(D) 20 years 6 months

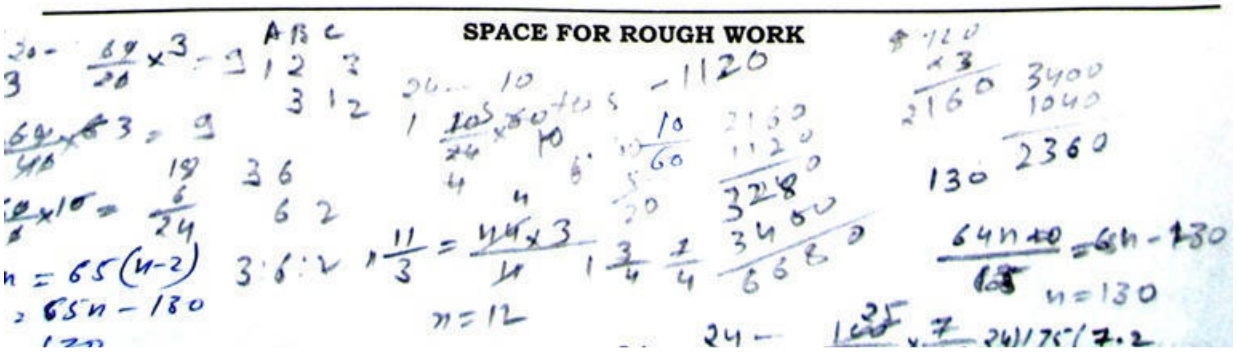
133. Of the three numbers, the second is twice the first and thrice the third. If the average of the three numbers is 44, the largest number is
(A) 24
(B) 72
(C) 36
(D) 108

134. A cricketer had a certain average of runs for his 64 innings. In his 65th innings, he is bowled out for no score on his part. This brings down his average by 2 runs. His new average of runs is
(A) 130
(B) 128
(C) 70
(D) 68

135. A man completed a certain journey by a car. If he covered 30% of the distance at the speed of 20 km/hr, 60% of the distance at 40 km/hr and the remaining distance at 10 km/hr; his average speed for the whole journey was
(A) 25 km/hr
(B) 28 km/hr
(C) 30 km/hr
(D) 33 km/hr

136. The time duration of 1 hour 45 minutes is what percent of a day?
(A) 7·218
(B) 7·291
(C) 8·3
(D) 8·24

SPACE FOR ROUGH WORK



137. In an examination, 35% of the candidates failed in Mathematics and 25% in English. If 10% failed in both Mathematics and English, then how much percent passed in both the subjects?

(A) 50
(B) 55
(C) 57
(D) 60

138. If $\frac{2}{3}$ of $A = 75\%$ of $B = 0{\cdot}6$ of C, then $A : B : C$ is

(A) 2 : 3 : 3
(B) 3 : 4 : 5
(C) 4 : 5 : 6
(D) 9 : 8 : 10

139. Each side of a rectangular field is diminished by 40%. By how much percent is the area of the field diminished?

(A) 32
(B) 64
(C) 25
(D) 16

140. The price of sugar rises by 25%. If a family wants to keep their expenses on sugar the same as earlier, the family will have to decrease its consumption of sugar by

(A) 25%
(B) 20%
(C) 80%
(D) 75%

141. The price of an article is reduced by 25% but the daily sale of the article is increased by 30%. The net effect on the daily sale receipts is

(A) $2\frac{1}{2}$% increase
(B) $2\frac{1}{2}$% decrease
(C) 2% increase
(D) 2% decrease

142. If x earns 25% more than y, what percent less does y earn than x?

(A) 16
(B) 10
(C) 20
(D) 25

143. The cost of an article was Rs 75. The cost was first increased by 20% and later on it was reduced by 20%. The present cost of the article is

(A) Rs 72
(B) Rs 60
(C) Rs 75
(D) Rs 90

144. If A and B are in the ratio 3 : 4, and B and C in the ratio 12 : 13, then A and C will be in the ratio

(A) 3 : 13
(B) 9 : 13
(C) 36 : 13
(D) 13 : 9

SPACE FOR ROUGH WORK

145. Four years ago, the ratio of *A*'s age to *B*'s age was 11 : 14 and four years later, their ages will be in the ratio 13 : 16. The present age of *A* is

(A) 48 years

(B) 26 years

(C) 44 years

(D) 28 years

146. In an alloy, zinc and copper are in the ratio 1 : 2. In the second alloy, the same elements are in the ratio 2 : 3. If these two alloys be mixed to form a new alloy in which the two elements are in the ratio 5 : 8, the ratio of these two alloys in the new alloy is

(A) 3 : 10

(B) 3 : 7

(C) 10 : 3

(D) 7 : 3

147. A jar contained a mixture of two liquids *A* and *B* in the ratio 4 : 1. When 10 litres of the mixture was taken out and 10 litres of liquid *B* was poured into the jar, this ratio became 2 : 3. The quantity of liquid *A* contained in the jar was

(A) 4 litres

(B) 8 litres

(C) 16 litres

(D) 32 litres

148. The salaries of *A*, *B* and *C* are in the ratio 1 : 3 : 4. If the salaries are increased by 5%, 10% and 15% respectively, then the increased salaries will be in the ratio

(A) 20 : 66 : 95

(B) 21 : 66 : 95

(C) 21 : 66 : 92

(D) 19 : 66 : 92

149. The total marks obtained by Arun in English and Mathematics are 170. If the difference between his marks in these two subjects is 10, then the ratio of his marks in these subjects is

(A) 7 : 8

(B) 8 : 7

(C) 9 : 8

(D) 9 : 7

150. *A* started a business with a capital of Rs 1,00,000. One year later, *B* joined him with a capital of Rs 2,00,000. At the end of 3 years from the start of the business, the profit earned was Rs 84,000. The share of *B* in the profit exceeded the share of *A* by

(A) Rs 10,000

(B) Rs 12,000

(C) Rs 14,000

(D) Rs 15,000

SPACE FOR ROUGH WORK

151. In a mixture of 75 litres, the ratio of milk to water is 2 : 1. The amount of water to be further added to the mixture so as to make the ratio of the milk to water 1 : 2 will be

(A) 45 litres

(B) 60 litres

(C) 75 litres

(D) 80 litres

152. The ratio in which two sugar solutions of concentrations 15% and 40% are to be mixed to get a solution of concentration 30% is

(A) 2 : 3

(B) 3 : 2

(C) 8 : 9

(D) 9 : 8

153. A boy has a few coins of denominations 50 paise, 25 paise and 10 paise in the ratio 1 : 2 : 3. If the total amount of the coins is Rs 6·50, the number of 10-paise coins is

(A) 5

(B) 10

(C) 15

(D) 20

154. A sum of Rs 13,360 was borrowed at $8\frac{3}{4}\%$ per annum compound interest and paid back in two years in two equal annual instalments. What was the amount of each instalment?

(A) Rs 5,769

(B) Rs 7,569

(C) Rs 7,009

(D) Rs 7,500

155. If Rs 12,000 is divided into two parts such that the simple interest on the first part for 3 years at 12% per annum is equal to the simple interest on the second part for $4\frac{1}{2}$ years at 16% per annum, the greater part is

(A) Rs 8,000

(B) Rs 6,000

(C) Rs 7,000

(D) Rs 7,500

156. At what rate of simple interest per annum will a sum become $\frac{7}{4}$ of itself in 4 years?

(A) 18%

(B) $18\frac{1}{4}\%$

(C) $18\frac{3}{4}\%$

(D) $18\frac{1}{2}\%$

SPACE FOR ROUGH WORK

157. A sum of money at a certain rate per annum of simple interest doubles in 5 years and at a different rate becomes three times in 12 years. The lower rate of interest per annum is

(A) 15%

(B) 20%

(C) $15\frac{3}{4}\%$

(D) $16\frac{2}{3}\%$ ✓

158. A certain sum, invested at 4% per annum compound interest, compounded half-yearly, amounts to Rs 7,803 at the end of one year. The sum is

(A) Rs 7,000

(B) Rs 7,200

(C) Rs 7,500 ✓

(D) Rs 7,700

159. The difference between compound and simple interests on a certain sum for 3 years at 5% per annum is Rs 122. The sum is

(A) Rs 16,000

(B) Rs 15,000

(C) Rs 12,000

(D) Rs 10,000

160. A certain sum amounts to Rs 5,832 in 2 years at 8% per annum compound interest; the sum is

(A) Rs 5,000 ✓

(B) Rs 5,200

(C) Rs 5,280

(D) Rs 5,400

161. The compound interest on a certain sum of money at 5% per annum for 2 years is Rs 246. The simple interest on the same sum for 3 years at 6% per annum is

(A) Rs 435

(B) Rs 450

(C) Rs 430

(D) Rs 432 ✓

162. A tradesman marks his goods at 25% above the cost price and allows purchasers a discount of $12\frac{1}{2}\%$. His profit is

(A) 8%

(B) 8·5%

(C) 8·625%

(D) 9·375% ✓

163. The marked price of a watch was Rs 820. A man bought the watch for Rs 570·72 after getting two successive discounts, of which the first was 20%. The second discount was

(A) 18%

(B) 15%

(C) 13% ✓

(D) 11%

SPACE FOR ROUGH WORK

164. While selling a cooler, a shopkeeper gives a discount of 10% on the marked price. If he gives a discount of 12%, he earns Rs 35 less as profit. The marked price of the cooler is

(A) Rs 1,650

(B) Rs 1,625

(C) Rs 1,725

(D) Rs 1,750

165. A trader gains 15% after selling an item at 10% discount on the printed price. The ratio of the cost price and printed price of the item is

(A) 18 : 23

(B) 17 : 18

(C) 17 : 23

(D) 18 : 25

166. A bicycle, marked at Rs 2,000, is sold with two successive discounts of 20% and 10%. An additional discount of 5% is offered for cash payment. The selling price of the bicycle at cash payment is

(A) Rs 1,368

(B) Rs 1,468

(C) Rs 1,568

(D) Rs 1,668

167. If p men working p hours per day for p days produce p units of work, then the units of work produced by n men working n hours a day for n days is

(A) $\frac{p^2}{n^2}$ (B) $\frac{p^3}{n^2}$

(C) $\frac{n^2}{p^2}$ (D) $\frac{n^3}{p^2}$

168. An empty tank can be filled by pipe A in 4 hours and by pipe B in 6 hours. If the two pipes are opened for 1 hour each alternately with first opening pipe A, then the tank will be filled in

(A) $1\frac{3}{4}$ hours

(B) $2\frac{3}{5}$ hours

(C) $4\frac{2}{3}$ hours

(D) $5\frac{1}{2}$ hours

169. A and B can separately complete a piece of work in 20 days and 30 days respectively. They worked together for some time, then B left the work. If A completed the rest of the work in 10 days, then B worked for

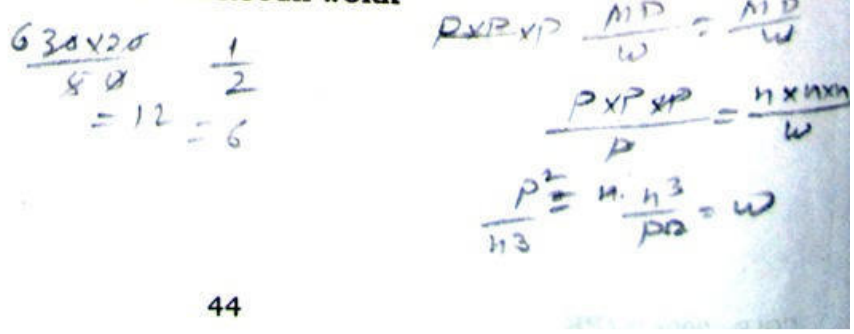
(A) 6 days

(B) 8 days

(C) 12 days

(D) 16 days

SPACE FOR ROUGH WORK



170. A boy and a girl together fill a cistern with water. The boy pours 4 litres of water every 3 minutes and the girl pours 3 litres every 4 minutes. How much time will it take to fill 100 litres of water in the cistern?

(A) 36 minutes

(B) 42 minutes

(C) 48 minutes

(D) 44 minutes

171. If 28 men complete $\frac{7}{8}$ of a piece of work in a week, then the number of men, who must be engaged to get the remaining work completed in another week, is

(A) 5 (B) 6

(C) 4 (D) 3

172. While working 7 hours a day, *A* alone can complete a piece of work in 6 days and *B* alone in 8 days. In what time would they complete it together, working 8 hours a day?

(A) 3 days

(B) 4 days

(C) 2·5 days

(D) 3·6 days

173. A man can row 15 km/hr downstream and 9 km/hr upstream. The speed of the boat in still water is

(A) 8 km/hr

(B) 10 km/hr

(C) 15 km/hr

(D) 12 km/hr

174. From two places, 60 km apart, *A* and *B* start towards each other at the same time and meet each other after 6 hours. Had *A* travelled with $\frac{2}{3}$ of his speed and *B* travelled with double his speed, they would have met after 5 hours. The speed of *A* is

(A) 4 km/hr

(B) 6 km/hr

(C) 10 km/hr

(D) 12 km/hr

175. A train, 150 m long, passes a pole in 15 seconds and another train of the same length travelling in the opposite direction in 12 seconds. The speed of the second train is

(A) 45 km/hr

(B) 48 km/hr

(C) 52 km/hr

(D) 54 km/hr

176. *A*, *B* and *C* start together from the same place to walk round a circular path of length 12 km. *A* walks at the rate of 4 km/hr, *B* 3 km/hr and *C* $\frac{3}{2}$ km/hr. They will meet together at the starting place at the end of

(A) 10 hours

(B) 12 hours

(C) 15 hours

(D) 24 hours

SPACE FOR ROUGH WORK

177. A train travelling at 48 km/hr crosses another train, having half its length and travelling in opposite direction at 42 km/hr, in 12 seconds. It also passes a railway platform in 45 seconds. The length of the railway platform is

(A) 200 m

(B) 300 m

(C) 350 m

(D) 400 m

178. Ravi and Ajay start simultaneously from a place *A* towards *B*, 60 km apart. Ravi's speed is 4 km/hr less than that of Ajay. Ajay, after reaching *B*, turns back and meets Ravi at a place 12 km away from *B*. Ravi's speed is

(A) 12 km/hr

(B) 10 km/hr

(C) 8 km/hr

(D) 6 km/hr

179. Two boats *A* and *B* start towards each other from two places, 108 km apart. Speeds of the boats *A* and *B* in still water are 12 km/hr and 15 km/hr respectively. If *A* proceeds down and *B* up the stream, they will meet after

(A) 4·5 hours

(B) 4 hours

(C) 5·4 hours

(D) 6 hours

180. In a fixed time, a boy swims double the distance along the current that he swims against the current. If the speed of the current is 3 km/hr, the speed of the boy in still water is

(A) 6 km/hr

(B) 9 km/hr

(C) 10 km/hr

(D) 12 km/hr

181. A person sold a horse at a gain of 15%. Had he bought it for 25% less and sold it for Rs 600 less, he would have made a profit of 32%. The cost price of the horse was

(A) Rs 3,750

(B) Rs 3,250

(C) Rs 2,750

(D) Rs 2,250

182. A piece of land came to a person through three middlemen each gaining 20%. If the person purchased the land for Rs 3,45,600, the original cost of the land was

(A) Rs 1,00,000

(B) Rs 1,50,000

(C) Rs 1,75,800

(D) Rs 2,00,000

SPACE FOR ROUGH WORK

183. A man sold some articles at a gain of 10%. He spent his total sale proceeds to purchase such articles again. This time, while selling them, he incurred a loss of 10%. His loss or gain in the transaction was

(A) 1% loss

(B) 1% gain

(C) no profit no loss

(D) 2% loss

184. A shopkeeper bought 80 kg of sugar at the rate of Rs 13·50 per kg. He mixed it with 120 kg of sugar costing Rs 16 per kg. In order to make a profit of 20%, he must sell the mixture at

(A) Rs 18 per kg

(B) Rs 17 per kg

(C) Rs 16·40 per kg

(D) Rs 15 per kg

185. Some toffees were bought at the rate of 11 for Rs 10 and the same number at the rate of 9 for Rs 10. If the whole lot was sold at one rupee per toffee, then the gain or loss in the whole transaction was

(A) loss of 1%

(B) gain of 1%

(C) neither gain nor loss

(D) gain of 1·5%

186. A merchant finds his profit as 20% of the selling price. His actual profit is

(A) 20%

(B) 22%

(C) 25%

(D) 30%

187. The height of an equilateral triangle is $4\sqrt{3}$ cm. The ratio of the area of its circumcircle to that of its in-circle is

(A) 2 : 1

(B) 4 : 1

(C) 4 : 3

(D) 3 : 2

188. A wire when bent in the form of an equilateral triangle encloses a region having area of $121\sqrt{3}$ cm^2. If the same wire is rebent into the form of a circle, its radius will be (take $\pi = \frac{22}{7}$)

(A) 21 cm

(B) 15·75 cm

(C) 10·5 cm

(D) 9 cm

189. If the perimeter of a semicircular field is 144 m, then the diameter of the field is (take $\pi = \frac{22}{7}$)

(A) 55 m

(B) 30 m

(C) 28 m

(D) 56 m

SPACE FOR ROUGH WORK

190. The sides of a triangle are 6 cm, 8 cm and 10 cm. The area of the greatest square that can be inscribed in it, is

(A) $18\ cm^2$

(B) $15\ cm^2$

(C) $\frac{2304}{49}\ cm^2$

(D) $\frac{576}{49}\ cm^2$

191. The perimeter (in metres) of a semicircle is numerically equal to its area (in square metres). The length of its diameter is (take $\pi = \frac{22}{7}$)

(A) $3\frac{6}{11}$ metres

(B) $5\frac{6}{11}$ metres

(C) $6\frac{6}{11}$ metres

(D) $6\frac{2}{11}$ metres

192. If S_1 and S_2 be the surface area of a sphere and the curved surface area of the circumscribed cylinder respectively, then S_1 is equal to

(A) $\frac{3}{4}S_2$

(B) $\frac{1}{2}S_2$

(C) $\frac{2}{3}S_2$

(D) S_2 ✓

193. The base of a conical tent is 19·2 metres in diameter and its height is 2·8 metres. The area (in square metres) of the canvas required to put up such a tent is nearly (use $\pi = \frac{22}{7}$)

(A) 3017·10

(B) 3170

(C) 301·71

(D) 30·17

194. A solid metallic sphere of radius 3 decimetres is melted to form a circular sheet of 1 millimetre thickness. The diameter of the sheet so formed is

(A) 26 metres

(B) 24 metres

(C) 12 metres

(D) 6 metres

195. The height and the radius of the base of a right circular cone are 12 cm and 6 cm respectively. The radius of the circular cross-section of the cone cut by a plane parallel to its base at a distance of 3 cm from the base is

(A) 4 cm

(B) 5·5 cm

(C) 4·5 cm

(D) 3·5 cm

SPACE FOR ROUGH WORK

196. Water flows through a cylindrical pipe, whose radius is 7 cm, at 5 metres per second. The time, it takes to fill an empty water tank, with height 1·54 metres and area of the base (3 × 5) square metres, is (take $\pi = \frac{22}{7}$)

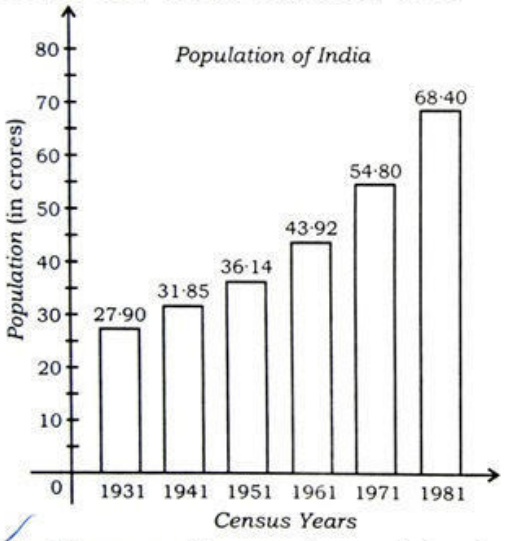
(A) 6 minutes

(B) 5 minutes

(C) 10 minutes

(D) 9 minutes

Directions : The Bar Graph given here shows the population (in crores) of India in various census years. Observe the graph and answer Question Nos. **197** to **200** based on it.



197. The percent increase in population from 1971 to 1981 is

(A) 24·8 (B) 20

(C) 16·7 (D) 22·9

198. In which census year, the percent increase in population is highest as compared to that in the previous census year?

(A) 1951

(B) 1961

(C) 1971

(D) 1981

199. In which census year, the percent increase in population is least as compared to that in the previous census year?

(A) 1961

(B) 1951

(C) 1971

(D) 1941

200. Per year increase in population from the year 1931 to 1981 is

(A) 8100000

(B) 7600000

(C) 8900000

(D) 6700000

SPACE FOR ROUGH WORK