

101. The sky appears blue due to:
(1) reflection of light (2) refraction of light
(3) total internal reflection of light (4) scattering of light
101. 4
101. *Due to scattering of light.*
102. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$, this reaction is an example of a:
(1) combination reaction (2) double displacement reaction
(3) decomposition reaction (4) displacement reaction
102. 4
102. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
This reaction is an example of displacement reaction.
103. The chemical formula of baking soda is:
(1) $NaHCO_3$ (2) Na_2CO_3
(3) $CaOCl_2$ (4) $CaSO_4$
103. 1
103. $NaHCO_3$, sodium bicarbonate is commonly called as baking soda.
104. Which one of the following types of medicines is used for treating indigestion:
(1) antibiotic (2) analgesic
(3) antacid (4) antiseptic
104. 3
104. *Antacids like $Mg(OH)_2$ Milk of magnesia are used for treating indigestion.*
105. The kidney in human being are a part of the system for:
(1) nutrition (2) respiration
(3) excretion (4) transportation
105. 3
105. *The filtration of blood takes place in kidney.*
106. The xylem in plants are responsible for:
(1) transport of water (2) transport of food
(3) transport of amino acid (4) transport of oxygen
106. 1
106. *Transport of water in plants is through Xylem.*
107. The least distance of distinct vision for a young adult with normal vision is about:
(1) 25 meter (2) 2.5 cm
(3) 25 cm (4) 2.5 meter
107. 3
107. *25 cm*
108. The plant hormone is:
(1) insulin (2) thyroxine
(3) oestrogen (4) cytokinin
108. 4
108. *The plant hormones include Auxin, Cytokinin, Gibberellins, Abscisic acid, ethylene.*
109. The gap between two neurons is called a:
(1) dendrite (2) synapse
(3) axon (4) impulse
109. 2
109. *The gap between two neurons is called synapse.*
110. The device used for measuring electric current is:

110. **(1) generator** **(2) galvanometer**
(3) ammeter **(4) motor**
110. 3
110. *ammeter*
111. **The image produced by a concave lens is always:**
(1) real **(2) virtual**
(3) inverted **(4) enlarged**
111. 2
111. *Virtual*
112. **The unit of electrical energy is:**
(1) watt **(2) kilowatt**
(3) kilowatt per hour **(4) kilowatt hour**
112. 4
112. *kilowatt hours.*
113. **A solution turns red litmus into blue, its pH is likely to be:**
(1) 1 **(2) 4**
(3) 5 **(4) 10**
113. 4
113. *A solution of pH 10 would be basic and will turn red litmus into blue.*
114. **The anther contains:**
(1) sepals **(2) ovules**
(3) carpel **(4) pollengrains**
114. 4
114. *Anther is the male part of a flower and contains male gametes in pollen grains.*
115. **The main factor of depletion of ozone layer is:**
(1) chlorofluorocarbons **(2) oxygen**
(3) sulphur **(4) nitrogen**
115. 1
115. *CFCs react with ozone (O_3) and thus deplete the ozone layer.*
116. **Which part of the human brain is most developed:**
(1) cerebrum **(2) cerebellum**
(3) hypothalamus **(4) medulla oblangeta**
116. 1
116. *Since birth, cerebrum is the most developed part of the human brain.*
117. **The full form of T. S. H is:**
(1) thyroxin stimulating hormone **(2) thymein stimulating hormone**
(3) tyrocin stimulating hormone **(4) thyroid stimulating hormone**
117. 4
117. *TSH = Thyroid Stimulation Hormone*
118. **The drugs obtain from plant is:**
(1) caolin **(2) insulin**
(3) magnesium sulphate **(4) morphine**
118. 4
118. *It is an analgesic and narcotic drug obtained from opium (poppy plant)*
119. **Artificial soap is:**
(1) sodium stearate **(2) lloril sulphuric acid**
(3) lloril alcohol **(4) sodium lloril sulphate**
119. 4

119. *Sodium lauryl sulphate. Soaps are sodium salts of fatty acids whereas as detergents are sulphate salts of fatty acids.*
120. **The example of thermosetting plastic is:**
(1) polythene (2) polyvinyl chloride
(3) bakelite (4) polystyrene
120. 3
120. *Thermosetting plastics are those which cannot be remoulded. Eg. Bakelite*
121. **The suitable catalyst in hydrogenation of oil is:**
(1) Fe (2) Pt
(3) Ni (4) Mo
121. 3
121. *H₂ adsorbed on Ni, Pt or Pd is used for the hydrogenation of vegetable oil to vegetable ghee.*
122. **Sphygmomanometer measure:**
(1) blood pressure (2) pulse-rate
(3) heart beat (4) sugar level
122. 1
122. *Sphygmomanometer measures blood pressure.*
123. **A lens have power +5D. This lens will be:**
(1) a convex lens of focal length 0.20 m (2) a concave lens of focal length 0.20 m
(3) a convex lens of focal length 0.20 m (4) a concave lens of focal length 0.05 m
123. 3
123. *A convex lens of focal length 0.20 m as $P(D) = \frac{1}{f(m)}$*
124. **The magnetic field inside a long straight solenoid carry current:**
(1) is zero (2) decreases as we move towards its end
(3) increases as we move towards its end (4) is the same at all points
124. 4
124. *Is same for all points $\mu_0 ni$*
125. **Which of the following is incorrect:**
(1) 1 ampere \times 1 second = 1 coulomb (2) 1 coulomb \times 1 joule = 1 volt
(3) 1 volt \times 1 coulomb = 1 joule (4) 1 volt \times 1 ampere = 1 joule per second
125. 2
125. *As $W = QV \Rightarrow 1C \times 1J \neq 1 \text{ volt}$. So option 2 is in correct.*
126. **Gene are present:**
(1) in cell (2) in nucleus
(3) in mitochondria (4) on chromosomes
126. 4
126. *Genes are segment of DNA present on chromosomes.*
127. **Which of the following is made in anaerobic respiration:**
(1) ethyl alcohol (2) ethylene
(3) glucose (4) glycerol
127. 1
$$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + 2ATP$$

Glucose Ethyl Alcohol
128. **Explosive material is:**
(1) picric acid (2) tetracycline

- (3) cellulose nitrate (4) Bakelite
128. 1, 3
128. Both picric acid and cellulose nitrate are used as explosives.
129. A simple pendulum perform 18 oscillation per second the mechanical wave produced by it will be:
(1) sound wave (2) ultrasonic wave
(3) subsonic wave (4) electromagnetic wave
129. 1
129. Sound wave but of frequency which is less then audible range.
130. The power of electric power station is 200 mega watt, the electrical energy produced by it daily, will be:
(1) 200 mega watt hour (2) 4800 mega watt hour
(3) 4800 mega watt (4) 48 joule
130. 2
130. Energy produced in 1S = 200×10^6 J.
Energy produced in 1 day
= $200 \times 10^6 \times 86400$ S
= 1728×10^{10} J
In KWHs = $= \frac{1728 \times 10^{10}}{3.6 \times 10^6} = 4800$ megawatt hour
131. MPO_4 is the formula of phosphate of an element. The molecular formula of its nitrate will be:
(1) MNO_3 (2) $M(NO_3)_3$
(3) $M_2(NO_3)$ (4) $M(NO_3)_2$
131. 2
131. The valency of the metal is 3. The cation formed is M^{+3} , thus the formula of its nitrate will be $M(NO_3)_3$
132. It is written 100 watt – 250 volt on any bulb its resistance will be:
(1) 25000 ohm (2) 625 ohm
(3) 25 ohm (4) 2.5 ohm
132. 2
132. $P = V^2 / R$
133. Food cans are coated with tin and not with zinc because:
(1) zinc is costier than tin (2) zinc has a higher melting point than tin
(3) zinc is more reactive than tin (4) zinc is less reactive than tin
133. 3
133. As zinc is more reactive than tin thus food cans are coated with tin and not with zinc.
134. The refractive index of glass is maximum for:
(1) red colour (2) yellow colour
(3) violet colour (4) green colour
134. 3
134. Refractive index increases as wave length decreases
135. The human eye can focus objects at different distances by adjusting the focal length of the eye-lens. This is due to:
(1) presbyopia (2) near-sightedness
(3) accommodation (4) far-sightedness
135. 3
136. Which one of the following is not an acidic salt:
(1) $NaHSO_4$ (2) NaH_2PO_4
(3) Na_3PO_4 (4) Na_2HPO_2

136. 3
136. Na_3PO_4 is a simple or normal salt. As it does not release H^+ ions in solution.
137. The water solution of SO_2 is:
(1) sulphurous acid (2) sulphuric acid
(3) pyrosulphuric acid (4) None of these
137. 1
137. SO_2 on dissolving in water forms sulphurous acid
$$\text{H}_2\text{O} + \text{SO}_2 \rightarrow \text{H}_2\text{SO}_3$$
38. Which one of the following is not a semiconductor:
(1) pure silicon (2) pure germanium
(3) germanium with arsenic (4) silver
138. 4
138. Silver is the best conductor of electricity.
139. By which reaction metals are obtained from metal oxide:
(1) liquefaction (2) reduction
(3) calcination (4) roasting
139. 2
139. Metal oxides on reduction with a suitable reducing agent are converted into metals.
140. One nano meter is equal to:
(1) 10^9 meter (2) 10^6 meter
(3) 10^{-9} meter (4) 10^{-6} meter
140. 3
140. One nano meter $1\text{nm} = 10^{-9}\text{m}$
141. By whom 'Saka Era' was start:
(1) Kanishka (2) Ashoka
(3) Harshvardhan (4) Chandra Gupta Second
141. 1
141. Shaka Era was started by Kanishka.
142. 'Avesta' belongs to which religion:
(1) Muslim (2) Hindu
(3) Parsis (4) Christian
142. 3
142. Avesta belongs to Parsis.
143. Which city was founded by Sikandar:
(1) Allahabad (2) Sikandrabad
(3) Jaunpur (4) Agra
143. 4
143. Agra was founded by Sikander Lodi in 1504.
144. 'Din-E-Illahi' was related to:
(1) Akbar (2) Jhangir
(3) Shahjahan (4) Shershah
144. 1
144. Din-e-Illahi was started by Akhar.
145. Who devided the Bengal:
(1) Lord Curzon (2) Lord Minto
(3) Lord Erwin (4) Lord Mountbettan
145. 1
145. Lord Curzon divided Bengal in 1905.

146. Who among the following was associated with news paper 'Kesari':
(1) Mahatma Gandhi (2) Bal Gangadhar Tilak
(3) Subhas Chandra Bose (4) A. O. Hume
146. 2
146. Bal Gangadhar Tilak started the news paper Kesari.
147. Who wrote 'Chandrakanta':
(1) Srinivas Dass (2) Deviki Nandan Khatri
(3) raja ram mohan ray (4) mahatma Gandhi
147. 2
147. Devki Nandan Khatri wrote Chandrakanta Santati.
148. Who is called the 'Grand Old Man' of India:
(1) Surendra Nath Banerjee (2) Firozshah Metha
(3) Dadabhai Navroji (4) Motila Nehru
148. 3
148. Dadabhai Navroji was also called 'Grand Old Man of India'.
149. The first women President of the Indian National Congress was:
(1) Sucheta Kriplani (2) Rajkumari Amrit Kaur
(3) Sarojini Naidu (4) Annie Besant
149. 4
149. Annie Besant was the first woman President of Congress in 1917 session of Calcutta.
150. Sankhya Darshan is related with:
(1) Kapil (2) Gautam
(3) Jaimini (4) Patanjali
150. 1
150. Sankhya Darshan is related with Kapil.
151. The Chipko Movement is associated with:
(1) Women rights (2) Child rights
(3) Political rights (4) Forest conservation
151. 4
151. Chipko Movement is associated with Forest conservation.
152. The father of 'Green Revolution' in India is:
(1) Nagarjun (2) M. S. Swaminathan
(3) A. P. J. Abdul Kalam (4) Ramanujam
152. 2
152. M.S. Swaminathan is the father of Green Revolution in India.
153. Jharia, Raniganj & Bokaro are famous for:
(1) Petroleum (2) Bauxite
(3) Coal (4) Diamond
153. 3.
153. Jharia, Raniganj & Bakaro are famous for Coal.
154. When was the 'Project Tiger' launched:
(1) 1973 (2) 1976
(3) 1978 (4) 1980
154. 1
154. 'Project Tiger' was launched in 1973.
155. Napanagar is situated at:
(1) Uttar Pradesh (2) Madhya Pradesh
(3) Bihar (4) Rajasthan

155. 2
155. *Nepanagar is situated in Madhya Pradesh.*
156. **Extreme heat is found on**
(1) Tropic of Cancer (2) Equator
(3) Tropic of Capricorn (4) Antarctic line
156. 2
156. *Extreme heat is found on equator.*
157. **The world's highest peak is found in**
(1) Asia (2) South America
(3) North America (4) Europe
157. 1
157. *World's largest peak is found in Asia.*
158. **It is called the Earth's twin sister**
(1) Mars (2) Saturn
(3) Pluto (4) Venus
158. 4
158. *Venus is called as Earth's twin sister.*
159. **Gift of Nile river is called**
(1) China (2) Ethophiya
(3) Egypt (4) Sudan
159. 3
159. *Egypt is called as gift of Nile river.*
160. **Air pressure is commonly measured by an instrument called**
(1) Speedometer (2) Windvane
(3) Barometer (4) Anemometer
160. 3
160. *Air pressure is measured by Barometer.*
161. **Etna volcano is situated at**
(1) Chile (2) Sicily Island
(3) Japan (4) Philippines
161. 2
161. *Etna Volcano is situated in Sicily Islands, Italy.*
162. **The deep narrow valley found in mountaneous region is know as**
(1) Gorge (2) Meander
(3) Cliff (4) None of these
162. 1
162. *Deep Narrow valley in mountaneous region is called as Gorge.*
163. **Who was the first chairman of planning commission**
(1) Mahatma Gandhi (2) Pandit Jawaharlal Nehru
(3) Dr. Rajendra Prasad (4) Lal Bahadur Shastri
163. 2
163. *Nehru was the first chairman of Planning Commission.*
164. **The lowest level of trilevel Panchayati raj is**
(1) Nyay Panchayat (2) Block Panchayat
(3) Village Panchayat (4) Zila Panchayat
164. 3
164. *Village panchayat is the lowest level of Tri level Panchayati Raj.*
165. **United Nations organization was founded in**

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165. 4
165. UN was founded on 24th October 1945.
166. How many seats are there in Rajaya Sabha
(1) 250 (2) 245
(3) 233 (4) 145
166. 2
166. Rajya Sabha has maximum 250 seats but now at present it is 245 seats.
167. Which of the following is not the fundamental right
(1) Right against exploitation (2) Right to property
(3) Right of freedom of religion (4) Right of equality
167. 2
167. Right to property is not the fundamental right but it is a legal right (Article 300A).
168. Which is the 29th state of India
(1) Telangana (2) Purvanchal
(3) Uttaranchal (4) Jharkhan
168. 1
168. Telangana is the 29th state of India.
169. The First Indian Scientist who got Noble Prize was
(1) Prafulla Chand Roy (2) Meghanath Saha
(3) Birbal Sahani (4) C.V. Raman
169. 4
169. C.V. Raman was the first Indian Scientist who got Noble prize.
170. Who among the following has been Vice President of India
(1) Justice H.J. Kania (2) Justice Y.V. Chandrachud
(3) Justice M. Hidayatulla (4) Justice M.N. Venkatchelianh
170. 3
170. Justice M. Hidayatulla has been appointed vice-president of India.
171. The retirement age of Supreme Court judges is
(1) 60 Years (2) 62 Years
(3) 65 years (4) 68 years
171. 3
171. The retirement age of supreme court judge is 65 years.
172. The Pradhanmantri Jan-Dhan Yojna is related to
(1) Road Construction (2) Education
(3) Banking (4) Drinking water
172. 3
172. Pradhanmantri Jan-Dhan Yojana is related to Banking.
173. When did the community development programme start in India
(1) 1951 (2) 1952
(3) 1958 (3) 1961
173. 2
173. Community development programme started in 1952 in India.
174. The chairman of Neeti Aayog is
(1) Prime Minister (2) President
(3) Vice President (4) Finance Minister
174. 1
174. Prime minister is the chairman of 'Neeti Aayog'.

175. The duration of the 12th five year plan in India is
(1) 2012-2017 (2) 2014-2019
(3) 2013-2018 (4) 2015-2020
175. 1
175. Duration of 12th five years plan in India is 2012-2017.
176. Who built the 'Khajuraho' temple
(1) Holkars (2) Parmar
(3) Pallav (4) Chandela
176. 4
176. Chandela rulers built Khajuraho Temple.
177. Which of the following is not a source of income of central Government
(1) Custom Duty (2) Income Tax
(3) Central Excise Duty (4) Land Revenue
177. 4
177. Land revenue goes to state government.
178. Which among the following is a developing country
(1) France (2) Japan
(3) Argentina (4) Britain
178. 3
178. Among the following Argentina is a developing Country.
179. A crop grown in Zaid is
(1) Water melon (2) Wheat
(3) Maize (4) Jute
179. 1
179. Water Melon is a Zaid Crop.
180. White revolution is related with
(1) Agricultural (2) Dairy
(3) Fisheries (4) Poultry
180. 2
180. White revolution is related with Dairy.
181. The value of $\sin^2 \theta + \frac{1}{(1 + \tan^2 \theta)}$ is
(1) $\sin^2 \theta$ (2) $\cos^2 \theta$
(3) $\sec^2 \theta$ (4) 1
181. 4
181. $\sin^2 \theta + \frac{1}{1 + \tan^2 \theta} = \sin^2 \theta + \frac{1}{\sec^2 \theta} = \sin^2 \theta + \cos^2 \theta = 1.$
182. If $\sec \theta + \tan \theta = P$ then the value of $\frac{P^2 - 1}{P^2 + 1}$ is
(1) $\operatorname{cosec} \theta$ (2) $\sin \theta$
(3) $\frac{\tan \theta}{\sec \theta}$ (4) 1
182. 2 or 3
182. $P^2 - 1 = \sec^2 \theta + \tan^2 \theta + 2\sec \theta \tan \theta - 1 = 2\tan^2 \theta + 2\sec \theta + \tan \theta$
 $= 2\tan \theta(\sec \theta + \tan \theta)$
 $P^2 + 1 = 2\sec \theta(\sec \theta + \tan \theta)$

$$\therefore \frac{P^2 - 1}{P^2 + 1} = \frac{2 \tan \theta (\sec \theta + \tan \theta)}{2 \sec \theta (\sec \theta + \tan \theta)} = \frac{\tan \theta}{\sec \theta} = \sin \theta.$$

183. If $\tan \theta = \frac{a}{b}$ then the value of $\frac{b \sin \theta - a \cos \theta}{b \sin \theta + a \cos \theta}$ is

(1) 1

(2) $\frac{a^2 - b^2}{a^2 + b^2}$

(3) $\frac{b^2 - a^2}{b^2 + a^2}$

(4) 0

183. 4

183. $\frac{b \sin \theta - a \cos \theta}{b \sin \theta + a \cos \theta}$

Dividing Nr. & Dr. by $\cos \theta$

$$= \frac{b \tan \theta - a}{b \tan \theta + a} = \frac{b \times \frac{a}{b} - a}{b \times \frac{a}{b} + a} = \frac{0}{2a} = 0.$$

184. If $\sin \theta = \frac{4}{5}$, then value of $\cos 2\theta$ is

(1) 8/5

(2) 3/5

(3) 7/35

(4) -7/25

184. 4

184. $\sin \theta = \frac{4}{5}$

$$\sin^2 \theta = \frac{16}{25}$$

$$\cos 2\theta = 1 - 2 \sin^2 \theta$$

$$= 1 - 2 \times \frac{16}{25}$$

$$= \frac{-7}{25}$$

185. Each exterior angle of a regular Polygon of m sides is

(1) $\left(\frac{360}{m}\right) \pi$ degree

(2) $\left(\frac{360}{m}\right)$ degree

(3) $\left(\frac{180}{m}\right) \pi^2$ degree

(4) $\left(\frac{180}{m}\right)$ degree

185. 2

185. Sum of exterior angles of regular polygon of m sides = 360° .

$$\therefore \text{Each exterior angle} = \left(\frac{360}{m}\right)^\circ$$

186. If two equal circles of radius r passes through centre of the other, then the length of their common chord is

(1) $\frac{r}{\sqrt{3}}$

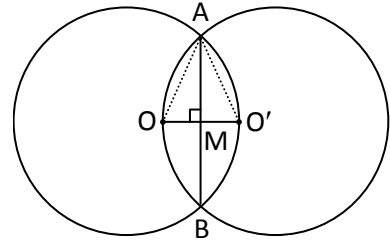
(2) $r\sqrt{3}$

(3) $r\sqrt{3}$

(4) $r\sqrt{2}$

186. 2

186. In right angled $\triangle AMO$
 $OM^2 + AM^2 = r^2$... (1)
 In right angled $\triangle AMO'$
 $(MO')^2 + AM^2 = r^2$... (2) ($\because OA = O'A$ given)
 From (1) and (2)



$$OM = O'M = \frac{r}{2}$$

$$\therefore \frac{r^2}{4} + AM^2 = r^2 \quad \text{from (1)}$$

$$\Rightarrow AM^2 = \frac{3}{4}r^2$$

$$\Rightarrow AM = \frac{\sqrt{3}}{2}r$$

$$\Rightarrow AB = \sqrt{3}r$$

Alternate solution

Since $\triangle OAO'$ is an equilateral triangle

$$\therefore AM = \frac{r\sqrt{3}}{2}$$

$$\therefore AB = 2AM = r\sqrt{3}$$

187. The H.C.F. of expression $(x+1)(x-1)^2$ and $(x+1)^2(x-1)$ is

(1) $(x+1)(x-1)$

(2) $(x+1)^2$

(3) $(x-1)^2$

(4) $(x+1)^2(x-1)^2$

187. 1

187. Let $f(x) = (x+1)(x-1)^2$ and $g(x) = (x+1)^2(x-1)$

$$\therefore \text{HCF} = (x+1)(x-1)$$

188. If a, b and c are any positive real number then the value of $\sqrt{a^{-1}b} \cdot \sqrt{b^{-1}c} \cdot \sqrt{c^{-1}a}$ is

(1) $1/2$

(2) 0

(3) 1

(4) -1

188. 3

$$188. \sqrt{a^{-1}b} \times \sqrt{b^{-1}c} \times \sqrt{c^{-1}a} = \sqrt{\frac{b}{a} \times \frac{c}{b} \times \frac{a}{c}} = \sqrt{1} = 1.$$

189. If roots of equation $2x^2 - 8x + c = 0$ are equal. Then the value of c will be

(1) 2

(2) 4

(3) 6

(4) 8

189. 4

189. \therefore Roots of the equation in equal.

$$\therefore b^2 - 4ac = 0$$

$$\Rightarrow (-8)^2 - 4 \times 2 \times c = 0$$

$$\Rightarrow 64 - 8c = 0$$

$$\Rightarrow c = 8$$

190. If mean of 5,10,15,P,20,35,40 is 21. Then the value of P will be

(1) 18

(2) 22

(3) 25

(4) 30

190. 2

$$190. \text{Mean} = \frac{5+10+15+P+20+35+40}{7}$$

$$\begin{aligned}\Rightarrow 21 \times 7 &= 125 + P \\ \Rightarrow 147 - 125 &= P \\ \Rightarrow P &= 22\end{aligned}$$

191. The median of first 10 prime numbers will be

- (1) 5 (2) 11
(3) 12 (4) 13

191. 3

191. First 10 prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

$$\text{Medium} = \frac{\left(\frac{10}{2}\right)^{\text{th}} + \left(\frac{10}{2} + 1\right)^{\text{th}}}{2} = \frac{5^{\text{th}} + 6^{\text{th}}}{2} = \frac{11 + 13}{2} = 12$$

192. The equation of a line which passes through points P (4,0) and Q(0,-3) will be

- (1) $\frac{x}{4} + \frac{y}{3} = 1$ (2) $\frac{x}{3} - \frac{y}{4} = 7$
(3) $\frac{x}{4} - \frac{y}{3} = 1$ (4) $\frac{x}{3} + \frac{y}{4} = 7$

192. 3

192. Using intercept form

$$\frac{x}{a} + \frac{y}{b} = 1 \text{ Here, } a = 4, b = -3$$

$$\therefore \text{Equation of line will be } \frac{x}{4} - \frac{y}{3} = 1.$$

193. If a numbers is divided by 6, the remainder is 3 then what will be the remainder when the square of the same numbers is divided by 6 again

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

193. 4

193. Let P be the number

$$P = 6q + 3$$

$$P^2 = (6q + 3)^2$$

$$= 36q^2 + 36q + 9 = 36q^2 + 36q + 6 + 3$$

$$= 6(6q^2 + 6q + 1) + 3$$

$$\therefore \text{Remainder} = 3$$

194. The radius of a sphere is r and radius of base of a cylinder is r and height is 2r. The ratio of their volumes will be

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

194. 1

$$194. \frac{\text{Volume of sphere}}{\text{Volume of cylinder}} = \frac{\frac{4}{3} \pi r^3}{\pi r^2 h} = \frac{\frac{4}{3} \pi r^3}{2 \pi r^3} = \frac{2}{3} = 2:3$$

195. In two spheres, the radius of first is half than second. Then what will be volume of second in comparison of first

- (1) 2 times (2) 4 times
(3) 8 times (4) $\frac{22}{7}$ times

195. 3

195. Let $R_1 = r$

$$R_2 = 2r$$

$$\frac{V_2}{V_1} = \frac{\frac{4}{3}\pi R_2^3}{\frac{4}{3}\pi R_1^3} = \left(\frac{2r}{r}\right)^3 = 8$$

$$\Rightarrow V_2 = 8V_1$$

196. The length of line segment is 3 which is perpendicular on line $4x+3y+C=0$ from the origin. Then value of c will be

(1) 0

(2) 7

(3) 10

(4) 15

196. 4

196. Length of perpendicular from point $P(x_1, y_1)$ to line $ax + by + c$ is given by

$$d = \frac{ax_1 + by_1 + c}{\sqrt{a^2 + b^2}}$$

$$d = 3, \text{ Point } (0, 0)$$

$$\text{line } 4x + 3y + c = 0$$

$$\Rightarrow 3 = \frac{4 \times 0 + 3 \times 0 + c}{\sqrt{3^2 + 4^2}}$$

$$\Rightarrow 3 = \frac{c}{\sqrt{25}} = \boxed{c = 15}$$

197. if $x = (3 + \sqrt{8})$, then $\left(x^2 + \frac{1}{x^2}\right)$ will be

(1) 38

(2) 36

(3) 34

(4) 30

197. 3

$$197. x = 3 + \sqrt{8}$$

$$\frac{1}{x} = 3 - \sqrt{8}$$

$$x + \frac{1}{x} = 3 + \sqrt{8} + 3 - \sqrt{8} = 6$$

$$x^2 + \frac{1}{x^2} + 2 = 36$$

$$x^2 + \frac{1}{x^2} = 34$$

198. If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$ then the value of x will be

(1) -1

(2) 1

(3) 2

(4) 3

198. 3

$$198. \left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$$

$$\Rightarrow \left(\frac{a}{b}\right)^{x-1} = \left(\frac{a}{b}\right)^{3-x}$$

On comparing the exponent, as base is same

$$x - 1 = 3 - x$$

$$\Rightarrow 2x = 4$$

$$\Rightarrow x = 2$$

199. If $x - y = 5$, $xy = 24$ then the value of $x^2 + y^2$ will be

(1) 23

(2) 73

(3) 65

(4) 74

199. 2

199. $x - y = 5$, $xy = 24$

$$(x - y)^2 = 25$$

$$\Rightarrow x^2 + y^2 - 2xy = 25$$

$$\Rightarrow x^2 + y^2 = 25 + 48$$

$$\Rightarrow x^2 + y^2 = 73$$

200. If mode of any series is 9 and median is 7 then mean of that series will be

(1) -6

(2) 6

(3) $-5/3$

(4) $5/3$

200. 2

200. Using formula

$$\text{mode} = 3 \text{ median} - 2 \text{ mean.}$$

$$\Rightarrow 2 \text{ mean} = 3 \text{ median} - \text{mode}$$

$$\Rightarrow \text{mean} = \frac{3 \times 7 - 9}{2}$$

$$\Rightarrow \text{mean} = 6$$