QUESTION PAPER

101. A bomb of Mass 30 kg at rest explodes into two pieces of masses 18 kg and 12 kg. The velocity of 18 kg mass is 6 m/s. The kinetic energy of the other mass is.
(1) 324 J   (2) 486 J
(3) 256 J   (4) 524 J

102. A body initially at rest start moving when a constant external force F is applied on it. The force F is applied for time t = 0 to time t = T. Which of the following graph represents the variation of the speed (v) of the body with time (t)
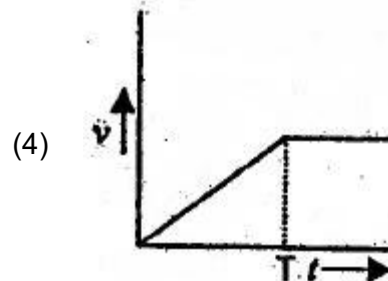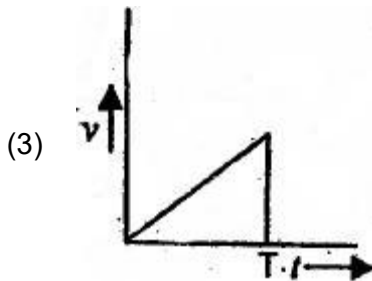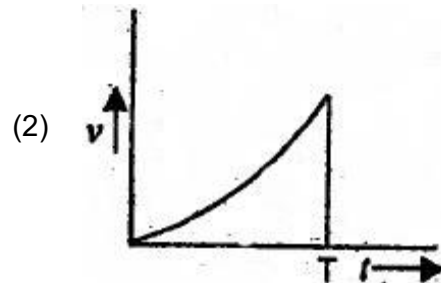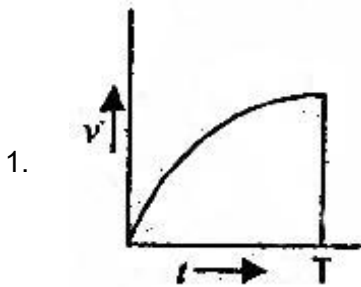

103. A person can not clearly see objects at a distance more than 40 cm. He is advised to use lens of power
(1) –2.5D   (2) 2.5D
(3) –1.5D   (4) 1.5D

104. Gravitational force is essentially required for
(1) Stirring in liquid   (2) Convection
(3) Conduction   (4) Radiation

105. An observer moves towards a stationary plane mirror at a speed of 4 m/s the speed with which his image move towards him?
(1) 2 m/s   (2) 4 m/s
(3) 8 m/s   (4) Image will stay at rest

106. If the ammeter in the given circuit reads 2 A, What is the value of resistance R (the resistance of ammeter is negligible).

(1) 1 Ω   (2) 2 Ω
(3) 3 Ω   (4) 4 Ω
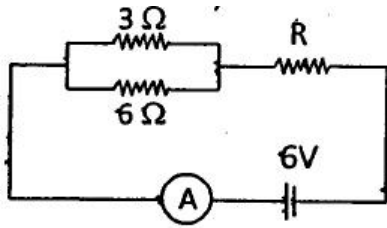
107. A particle starts its motion from rest under the action of a constant force. If the distance covered in first 10 seconds is S_1 and that covered in next 10 seconds is S_2 then
(1) $S_2 = 6 S_1$ (2) $S_2 = 2 S_1$
(3) $S_2 = 8 S_1$ (4) $S_2 = 3 S_1$

108. Two planets of radii r_1 and r_2 are made from the same material having same density. The ratio of acceleration due to gravity $g_1|g_2$ at the surfaces of the planets is
(1) $r_1|r_2$ (2) $r_2|r_1$
(3) $(r_1|r_2)^2$ (4) $(r_2|r_1)^2$

109. A concave mirror of focal length 15cm forms an image. The position of the object when the image is virtual and linear magnification is 2 is.
(1) 22.5 cm   (2) 7.5 cm
(3) 30 cm   (4) 45 cm

110. A body on an inclined plane slides down $\frac{1}{4}$th of distance in 2 seconds. It will slide down the complete distance along the plane in (the inclined plane have zero friction) –
(1) 4 s   (2) 5 s
(3) 2 s   (4) 3 s

111. When four equal resistors are connected in series with a battery they dissipate power of 10W. The power dissipated through any of them if connected across the same battery will be-
(1) 40 W   (2) 10/3 W
(3) 90 W   (4) 10 W

112. An electron move with velocity v in a uniform magnetic field B. The magnetic force experienced by the electron is
(1) always zero   (2) Never zero
(3) zero if v is perpendicular to B   (4) zero if v is parallel to B

113. In the given circuit the voltmeter reads 5V. The resistance of the voltmeter in Ohm is.
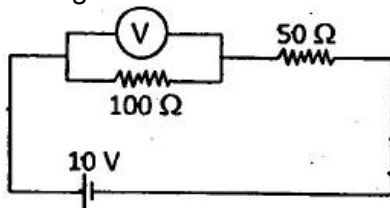
(1) 200   (2) 100
(3) 10   (4) 50

114. Which of the following contain seven molecules of water of crystallization?
(1) Epsom salt   (2) Green vitriol
(3) Blue vitriol   (4) White vitriol

115. Which elements are used for galvanization?
(1) Zn and Sn
(2) Na and K
(3) Cu and Fe
(4) Ca and Mg

116. Ramesh dropped a metal piece 'A' in the solution of another metal 'M'. After some time a new colourless compound 'N' is formed. A, M, N respectively can be
(1) Mg, NaCl, $MgCl_2$
(2) Fe, $ZnSO_4$, $FeSO_4$
(3) Zn, $CuSO_4$, $ZnSO_4$
(4) Cu, $ZnSO_4$, $CuSO_4$

117. Which fuel has highest calorific value?
(1) LPG
(2) Petrol
(3) CNG
(4) Hydrogen

118. The pH of acid rain is
(1) less than 5.6
(2) more than 5.6
(3) equal to 5.6
(4) more than 6.6

119. IUPAC name of the following compound will be

$$CH_3 - \overset{\overset{\displaystyle O}{\|}}{C} - CH_2 - CH_2 - CH_2 - COOH$$

(1) 2-Keto hexan – 6 oic acid
(2) 5 – Keto hexanoic acid
(3) Methyl Ketone butanoic acid
(4) 5 – Aldo hexanoic acid

120. Products obtained on electrolysis of brine are
(1) $NaHCO_3$, H_2, Cl_2
(2) H_2, NaOH, $NaHCO_3$
(3) Cl_2, NaOH, Na_2O_2
(4) NaOH, H_2, Cl_2

121. In balanced chemical equation
$$aKMnO_4 + bH_2SO_4 \longrightarrow cK_2SO_4 + dMnSO_4 + eH_2O + f[O]$$
Which of the following alternative are correct?
(1) a = 2, b = 3, c = 1, d = 2, e = 3, f = 5
(2) a = 1, b = 2, c = 1, d = 3, e = 2, f = 3
(3) a = 2, b = 3, c = 2, d = 3, e = 2, f = 5
(4) a = 3, b = 1, c = 3, d = 3, e = 1, f = 3

122. Benzene(C_6H_6) have
(1) 12 covalent bonds
(2) 15 covalent bonds
(3) 18 covalent bonds
(4) 9 covalent bonds

123. 1.0 Kg of Iron(Fe), having atomic mass equal to 56 g mol^{-1} contains
(1) 2.88×10^{24} atoms
(2) 6.93×10^{23} atoms
(3) 6.93×10^{21} atoms
(4) 1.075×10^{25} atoms

124. Aqueous solution of CsO_2 is
(1) Basic
(2) Neutral
(3) Acidic
(4) Amphoteric

125. A student added a drop of universal indicator to 1.00 mL of given solution and found that a green colour is produced, The pH value of the solution will be
(1) 7 – 9
(2) 0 – 3
(3) 10 – 12
(4) 4 – 6

126. Elements present in any group have the same number of
(1) valence electrons
(2) neutrons
(3) protons
(4) none of the above

127. Which of the following reactions takes place during break down of molecules in the respiration in our body?
(1) Oxidation
(2) Reduction
(3) Oxidation-reduction
(4) Photo-oxidation

128. Lactic acid is produced when pyruvate is broken down.
(1) in presence of oxygen in mitochondria
(2) in absence of oxygen in mitochondria
(3) in presence of oxygen in muscle cells
(4) in absence of oxygen in muscle cells

129. Separation of oxygenated and deoxygenated blood.
I. Fulfils energy requirement of the body
II. Ensures the effect transfer of oxygen in the body
(1) Both statements are true
(2) Statement I is true but statement II is false
(3) Statement I is false but statement II is true
(4) Both the statements are false

130. Root pressure is effective way transporting water in xylem. This pressure is generated
(1) in bright sunlight
(2) during night
(3) at very low temperature
(4) in high trees

131. Choose the correct option to complete 'A', 'B', 'C' and 'D' in the following table.

Hormone	Function
A	Stimulates growth in all organs
B	Stimulates igituitary to release growth hormone
C	Controls blood sugar level
D	Regulates carbohydrate metabolism

(1) A – Insulin, B – Thyroxine, C – Growth hormone, D – Growth hormone release factor
(2) A – Growth hormone, B – Insulin, C – Thyroxine, D – Growth hormone release factor
(3) A – Thyroxine, B – Insulin, C – Growth hormone, D – Growth hormone release factor
(4) A – Growth hormone, B – Growth hormone release factor, C – Insulin, D – Thyroxine

132. If a pea plant with wrinkled seeds and heterozygous tall plants were self pollinated, what will be the phenotypes of plants of F_2 generation.
(1) 75% plants will be tall and have wrinkled seeds and other 25% will be dwarf with wrinkled seeds.
(2) 50% plants will be tall and have wrinkled seeds and other 50% will be dwarf with wrinkled seeds.
(3) 50% plants will be tall and have wrinkled seed and other 50% will be dwarf with round seeds.
(4) 25% plants will be tall and have wrinkled seed and other 75% will be dwarf with wrinkled seeds.

133. Two similar pea plants are growing in two different islands separated by a vast ocean. The phenomenon of geographical isolation will
(1) not be seen as the plants get self pollinated
(2) be seen as the plants are growing in isolated regions
(3) not be seen as the plants get pollinated by ocean water currents
(4) be seen as the plants do not get pollinated and reproduces asexually

134. DDT is non-biodegradable chemical when it enters food chain it gets accumulated in each tropical level. The phenomenon is called as
(1) Eutrophication
(2) Chemical amplification
(3) Biomagnification
(4) Chemical magnification

135. Presence of _____ is an indicator of pollution level in water
(1) Colour
(2) Coliform bacteria
(3) Rhizo bacteria
(4) Spiral bacteria

136. Leaves of tendu are the source of income of large number of people of India. These leaves are used to make
(1) thatched roofs
(2) bidis
(3) leaf plates
(4) teetch cleaning agent

137. Maximum number of trophic levels supported in any ecosystem is
(1) one
(2) two
(3) three
(4) four

138. Correct sequence of reflex arc is
(1) Receptor → Motor Neuron → Sensory Neuron → Effector organ → Relay Neuron
(2) Receptor → Sensory Neuron → Motor Neuron → Effector organ → Relay Neuron
(3) Receptor → Sensory Neuron → Motor Neuron → Relay Neuron → Effector organ
(4) Receptor → Sensory Neuron → Relay Neuron → Motor Neuron → Effector organ

139. Tricuspid valve is present in
(1) right atria and right ventricle
(2) left atria and left ventricle
(3) wall of atrium
(4) wall of ventricle

140. BCG vaccine provide protection against
(1) measles
(2) T.B
(3) cholera
(4) small pox

141. Find the area of the square ABCD.
(1) 160 m^2
(2) 140 m^2
(3) 125 m^2
(4) 120 m^2

D — C

6 cm

8 cm

10 cm

A — B
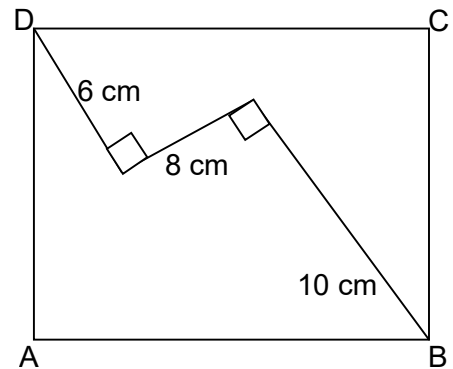
142. If $\left(2^x - 4\right)^3 + \left(4^x - 2\right)^3 = \left(4^x + 2^x - 6\right)^3$, then the sum of all real values of x is
(1) 0.5
(2) 1.5
(3) 2.5
(4) 3.5

143. If $2019^x + 2019^{-x} = 3$, then the value of $\sqrt{\dfrac{2019^{6x} - 2019^{-6x}}{2019^x - 2019^{-x}}}$ is:
(1) 3
(2) 6
(3) 9
(4) 12

144. Let 'p' be a root of the equation $x^2 - 5x + 7 = 0$, then the area of circle with centre at (p, p) and passing through point (1, 4) is
(1) 3π sq. units
(2) 5π sq. units
(3) 7π sq. units
(4) None of these

145. If $\dfrac{1}{x+y} = \dfrac{1}{x} + \dfrac{1}{y}$, then the value of $\left(\dfrac{x}{y}\right)^6 + \left(\dfrac{x}{y}\right)^3$ is

(1) 0   (2) $\dfrac{1}{2}$

(3) 1   (4) 2

146. Let a, b and c are the roots of the polynomial equation $x^3 - 597x - 5236 = 0$ then the value of $\left(a^3 + b^3 + c^3\right)$ is

(1) 597   (2) 15708

(3) 5236   (4) 10472

147. If $\operatorname{cosec} x + \cot x = a$, then the value of $\cos x$ is

(1) $a^2 + \dfrac{1}{a^2}$ (2) $\dfrac{a^2 + 1}{a^2 - 1}$

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

148. In an AP 2, 5, 8, 11,.....452. The mean of 15th, 16th 136th and 137th terms is

(1) 120   (2) 227

(3) 220   (4) 454

149. The minimum value of $\tan^2 x + \cot^2 x$ is:

(1) 1   (2) 0

(3) 2   (4) 3

150. If $f(x) = x^4 + ax^3 + bx^2 + cx + d$ is a polynomial such that

$f(1) = 5, f(2) = 10, f(3) = 15, f(4) = 20$, find the value of $\dfrac{f(12) + f(-8)}{100}$

(1) 198   (2) 198.4

(3) 198.6   (4) 199.2

151. The product of two 2 digits numbers is 2160 and their H.C. F is 12. Then sum of the number is

(1) 72   (2) 84

(3) 96   (4) 60

152. The angles of a pentagon are in arithmetic progression. The sum of the smallest and largest angle is

(1) 172°   (2) 108°

(3) 180°   (4) 216°

153. If $\sqrt{p} - \sqrt{q} = 20$, then the maximum value of $\left(\dfrac{p - 5q}{100}\right)$ is:

(1) 5   (2) 10

(3) 15   (4) 25

154. The area of trapezium ABCD where AB = 52 cm, BC = 12 cm, CD = 39 cm and DA = 5 cm and $AB \parallel CD$, is
(1) 210 sq. cm.
(2) 234 sq. cm.
(3) 260 sq. cm.
(4) 280 sq. cm.
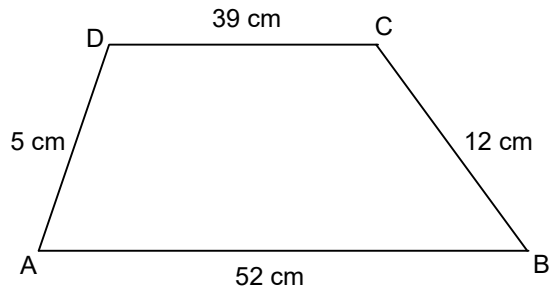
155. The difference between area of a triangle of largest area inscribed in a circle of radius 'r' units and a triangle of largest area inscribed in a semicircle of radius 'r' units is
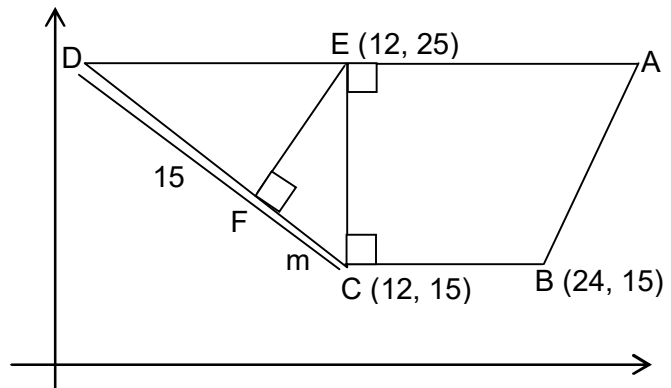
(1) $\left(\dfrac{2\sqrt{3}-1}{4} \right) r^2$ Sq. units

(2) $\left(\dfrac{4-2\sqrt{3}}{4} \right) r^2$ Sq. units

(3) $\left(\dfrac{3\sqrt{3}+4}{4} \right) r^2$ Sq. units

(4) $\left(\dfrac{3\sqrt{3}-4}{4} \right) r^2$ Sq. units

156. If p, q, r and s are distinct prime numbers such that $p+q+r = 72$, $p+r+s = 74$, $q+r+s = 89$. The largest of these p, q, r and s is
(1) $r = 53$
(2) $q = 53$
(3) $s = 53$
(4) $s = 49$

157. In the given figure, the value of m is
(1) 5
(2) 10
(3) 7
(4) 12

158. Find the sum of all real values of x which satisfy
$$\frac{1}{x^2 -10x -45} + \frac{1}{x^2 -10x -29} = \frac{2}{x^2 -10x -69}$$
(1) 7
(2) 10
(3) 13
(4) –3

159. If $N = \sqrt[3]{4} + \sqrt[3]{2} + 1$, then the value of $\dfrac{1}{N^3} + \dfrac{3}{N^2} + \dfrac{3}{N}$ is:
(1) 2
(2) 4
(3) 7
(4) 1

160. In a class average height of all students is 'p' cm. Among them, average height of 10 students is 'q' cm and the average height of the remaining students is 'r' cm. The number of students in the class is:

(1) $\dfrac{p(q-r)}{(p-r)}$

(2) $\dfrac{q-r}{p-r}$

(3) $\dfrac{q-r}{10(p-r)}$

(4) $\dfrac{10(q-r)}{(p-r)}$

161. What are the National colours of France?
(1) Blue-Green-Red
(2) Green-White-Red
(3) Green-Yellow-Red
(4) Blue-White-Red

162. Which was not included in Lenin's April theses?
(1) Formation of Duma
(2) Bank be Nationalised
(3) Land be transferred to peasant
(4) War be brought to a close

163. Hitler assigned the responsibility of Economic recovery to
(1) Herbert Spancer
(2) Hyalmar Schacht
(3) W Shirer
(4) Robert Lay

164. Which of these had worked as indentured Labourer?
(1) Shaukat Ali
(2) Alluri Sita Ram Raju
(3) Jawahar Lal Nehru
(4) Baba Ramchandra

165. Who wrote the Book "Hind Swaraj"?
(1) Subhash Chandra Bose
(2) J. L. Nehru
(3) Kamla Nehru
(4) Mahatma Gandhi

166. Which country was known as 'Siam'
(1) England
(2) Thailand
(3) Holand
(4) Swaziland

167. Which of the following Prime Minister Constituted "Simon Commission"?
(1) Robert Walpole
(2) Stanley Baldwin
(3) Ramsay Mac Donald
(4) Winston Churchil

168. Dr. B. R. Ambedkar formed the 'Depressed Classes Association in
(1) 1928
(2) 1929
(3) 1930
(4) 1931

169. Jeevita Samaram' is the autobiography of
(1) C. Kesavan
(2) Saudamini
(3) Mankojee
(4) R. C. Dutt

170. Who established the Vietnamese Communist Party?
(1) Phu So
(2) Mao Zedong
(3) Ho Chi Minh
(4) Phan Boi

171. "When France sneezes, the rest of Europe catches cold" who remarked this?
(1) Mazzini
(2) Metternich
(3) Gottfried
(4) John Lock

172. Which one of the following is the main cause of land degradation in Punjab.
(1) Intensive Cultivation
(2) Deforestation
(3) Over Irrigation
(4) Over Grazing

173. Traditional rain water harvesting is called in Rajasthan.
(1) Tank
(2) Tanka
(3) Pond
(4) Lake

174. Which of the state has most sugar mills in India?
(1) Haryana
(2) Punjab
(3) Maharashtra
(4) Bihar

175. In which industry Bauxite is used as raw material?
(1) Steel
(2) Cement
(3) Aluminium
(4) Jute

176. Roof top rain water harvesting is the most common practice in which of the following cities :-
(1) Shillong   (2) Imphal
(3) Guwahati   (4) Patna

177. Which of the following groups constitute the basic rock from :-
(1) Sandy, Igneous, Metamorphic   (2) Igneous, Sedimentary, Metamorphic
(3) Lignite, Volcanic, Sedimentory   (4) Sandy, Volcanic, Igneous

178. Mango showers occur in which one of the following group of two states :-
(1) Bihar & West Bengal   (2) Tamil Nadu & Andhra Pradesh
(3) Karnataka & Kerala   (4) Maharashtra & Andhra Pradesh

179. Tropic of Cancer does not pass through
(1) Chattisgarh   (2) Odisha
(3) Rajasthan   (4) Tripura

180. AMUL milk scheme is an example of which type of industry :-
(1) Basic Industry   (2) Agrobased Industry
(3) Joint Industry   (4) Co-operative Industry

181. Which one of the figures represents the working age groups of the population
(1) 15 – 65 years   (2) 15 – 66 years
(3) 15 – 59 years   (4) 15 – 64 years

182. Chemical Industries usually are located near :-
(1) Iron & steel Industries   (2) Thermal Power Plant
(3) Oil refineries   (4) Automobile Industry

183. BAMCEF means –
(1) Backward and minority community employees federation.
(2) Backward and mining community employees federation.
(3) Backward and majority community employees federation.
(4) Backward and malabar coastal employees federation.

184. General Election are called as :-
(1) On death of any member.
(2) Election before specific time in whole country and states.
(3) On completing five years.
(4) Empty seat due to any reason.

185. In 44th Amendment which fundamental right has been removed from the list of fundamental rights.
(1) Freedom to speech   (2) Freedom to make groups
(3) Right to work   (4) Right to property

186. Which of the following statement is correct?
(1) Union list – 66 subjects; state list – 97 subjects; Concurrent list – 47 subjects.
(2) Union list – 47 subjects; state list – 97 subjects; Concurrent list – 66 subjects.
(3) Union list – 97 subjects; state list – 47 subjects; Concurrent list – 66 subjects.
(4) Union list – 97 subjects; state list – 66 subjects; Concurrent list – 47 subjects.

187. A person who is not a member of any house of Parliament, if he is appointed as minister. He has to get elected to the one of the house of Parliament with in
(1) A month   (2) Six month
(3) Three month   (4) Stipulated time is fixedly the President

188. Why is "Power sharing" regarded as good?
(1) Reduces poverty
(2) Maximizes wealth
(3) Provides employment
(4) Reduces social conflict

189. Main feature of 'Pressure Groups' is :
(1) Direct control on political power.
(2) Try to influence the politics of Government
(3) Lax organization
(4) Direct participation in political powers.

190. Among the following which are/is the main aim of starting civil rights movements in America:-
(1) Adult franchise
(2) Vote to right for women
(3) Abolishing social discrimination
(4) Fan direct election of Congress

191. President can declare emergency :-
(1) Prime Minister advises him to do so.
(2) Parliament advises him to declare emergency.
(3) The council of minister, in writing, advises him to do so.
(4) Home Minister asks him to do so.

192. Amnesty International is an international organization which works for :-
(1) Work peace
(2) Justice
(3) Restoration of democracy
(4) Human Rights

193. In which year 'Universal Adult Franchise' was implemented in India?
(1) 1947
(2) 1950
(3) 1919
(4) 1935

194. In which year, consumer protection act was enacted?
(1) 1986
(2) 1988
(3) 1985
(4) 1987

195. Which among the following is considered to be most liquid assets?
(1) Gold
(2) Demand Deposits
(3) Land
(4) Money

196. Food security is ensured in a country only if –
(1) Enough food is available for all the person
(2) All persons have the capacity to buy food of acceptable quality
(3) There is no barrier on access to food
(4) All above

197. The headquarter of world trade organization is situated in
(1) New York
(2) China
(3) Japan
(4) Geneva

198. Under National Rural Employment Guarantee Act (2005), how many days of work are Guaranteed in a year?
(1) 80 days
(2) 100 days
(3) 200 days
(4) 300 days

199. Who is the founder of Grameen Bank of Bangladesh
(1) Abdul Rehman
(2) M. Yunis
(3) Mujibur Rehman
(4) Amartya Sen

200. From the following in which state of India the use of chemical fertilizer is highest?
(1) Punjab
(2) Haryana
(3) Rajasthan
(4) Himachal Pradesh