

MOCK TEST - 2

MATHMETICS

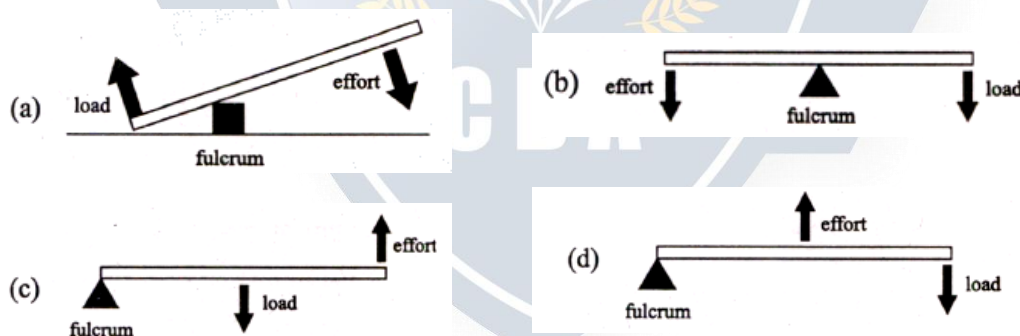
A university awarded medals in basketball, football and volleyball. Only x students ($x < 6$) got metal in all the three sports and the medals went to a total of $15x$ students. It awarded $5x$ medals in basketball, $(4x + 15)$ medals in football and $(x + 25)$ medals in volleyball.

- How many received medals in exactly two of the three sports?
 (a) $30 - 4x$ (b) $35 - 7x$ (c) $40 - 7x$ (d) $45 - 5x$
- How many received medals in at least two of three sports?
 (a) $30 - 6x$ (b) $35 - 6x$ (c) $40 - 5x$ (d) $40 - 6x$
- How many received medals in exactly one of three sports?
 (a) $21x - 40$ (b) $21x - 35$ (c) $20x - 35$ (d) $20x - 25$
- If ω is a non real cube root of 1, then what the value of $\left| \frac{1-\omega}{\omega+\omega^2} \right|$?
 (a) 3 (b) $\sqrt{3}$ (c) 1 (d) none of these
- If $X = \{(4^n - 3n - 1): n \in \mathbb{N}\}$ and $Y = \{9(n - 1): n \in \mathbb{N}\}$ then
 (a) $X \subset Y$ (b) $y \subset X$ (c) $X \cap Y = \emptyset$ (d) none of these
- If $f = \{(1,2), (3,5), (4,1)\}$ and $g = \{(2,3), (5,1), (1,3)\}$ then $g \circ f =$?
 (a) $\{(1,3), (3,1), (4,3)\}$ (b) $\{(1,5), (2,5), (5,2)\}$
 (c) $\{(3,1), (1,3), (3,4)\}$ (d) $\{(5,1), (5,2), (2,5)\}$
- Let $f(x) = \frac{1}{1-x}$ then $(f \circ f \circ f)(x) =$?
 (a) $\frac{x}{1-3x}$ (b) $\frac{1}{1-3x}$ (c) x (d) none of these
- If $f(x) = x^2 - 1$ and $g(x) = 3x + 1$ then $g \circ f(x) =$?
 (a) $9x^2 + 6x$ (b) $3x^2 - 1$ (c) $2x^2 - 1$ (d) $3x^2 - 2$
- The value of $\left(\frac{i+\sqrt{3}}{2}\right)^{100} + \left(\frac{i-\sqrt{3}}{2}\right)^{100}$ is
 (a) 1 (b) -1 (c) ω (d) ω^2
- Find the value of $\frac{a+b\omega+c\omega^2}{c+a\omega+b\omega^2} + \frac{a+b\omega+c\omega^2}{b+c\omega+a\omega^2} =$?
 (a) 2 (b) -2 (c) 1 (d) -1
- If $|z + \bar{z}| = |z - \bar{z}| = 2$, then z lies on
 (a) a straight line (b) a set of four lines (c) a line (d) a set of four lines
- $3(\cos 300^\circ - i \sin 30^\circ)$ when expressed in polar form:
 (a) $\frac{3}{\sqrt{2}}(\cos \frac{\pi}{4} + i \sin \frac{\pi}{4})$ (b) $\frac{3}{\sqrt{2}}(\cos \frac{\pi}{4} - i \sin \frac{\pi}{4})$ (c) $\frac{3}{\sqrt{2}}(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4})$ (d) none of these
- Which of the following statements is correct?
 (a) $2 + 3i > 1 + 4i$ (b) $3 + 5i > 4 + 3i$ (c) $4 + 5i > 2 + 3i$ (d) none of these
- Find 'n' if $P(n, 5) = 20 \cdot P(n, 3)$
 (a) 8 (b) 9 (c) 10 (d) 11
- How many diagonals are there in a decagon?
 (a) 10 (b) 25 (c) 35 (d) 45

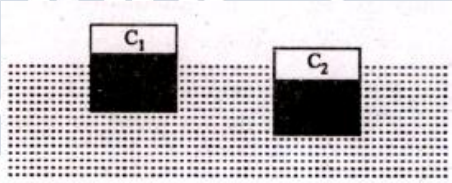
16. How many words can be formed from the letters of the word 'DAUGHTER' so that the vowels always come together?
 (a) 720 (b) 726 (c) 4320 (d) none of these
17. In how many ways can a party of 4 men and 4 women be seated at circular table so that no two women are adjacent?
 (a) 24×24 (b) $2 \times 4!$ (c) 144 (d) 4^4
18. In how many ways 6 rings of different type can be had in 4 fingers?
 (a) 6^4 (b) 4^6 (c) 6P_4 (d) none of these
19. How many 10 digits' numbers can be formed by using digits 1 and 2?
 (a) 10! (b) ${}^{10}C_2$ (c) ${}^{10}P_2$ (d) 2^{10}
20. In how many ways can the letters of the word MACHINE be arranged so that the vowels may occupy only odd positions?
 (a) $4 \times 7!$ (b) 576 (c) 288 (d) none of these
21. The number of positive integers greater than 6000 and less than 7000 which are divisible by 5, such that no digit repeated, is
 (a) 28 (b) 56 (c) 1440 (d) 722
22. The point equidistant from the points $O(0, 0, 0)$, $A(a, 0, 0)$, $B(0, b, 0)$ and $C(0, 0, c)$ is:
 (a) (a, b, c) (b) $\left(\frac{a}{2}, \frac{b}{2}, \frac{c}{2}\right)$ (c) $\left(\frac{a}{3}, \frac{b}{3}, \frac{c}{3}\right)$ (d) $\left(\frac{a}{4}, \frac{b}{4}, \frac{c}{4}\right)$
23. The vertices of triangle ABC are $A(3, 2, 0)$, $B(5, 3, 2)$ and $C(-9, 6, -3)$. The bisector AD of $\angle A$ meets BC at D. The coordinates of D are:
 (a) $\left(\frac{19}{4}, \frac{57}{4}, \frac{17}{4}\right)$ (b) $\left(\frac{19}{8}, \frac{57}{16}, \frac{17}{16}\right)$ (c) $\left(\frac{9}{2}, \frac{17}{2}, \frac{11}{2}\right)$ (d) none of these
24. Equation of the plane parallel to x axis is
 (a) $x = 0$ (b) $y = 0, z = 0$ (c) $by + cz + d = 0$ (d) none of these
25. Range of the function of $f(x) = \frac{x^2}{1+x^2}$ is
 (a) $[1, \infty[$ (b) $[0, 1[$ (c) $[-1, 1]$ (d) $]0, 1]$
26. Find set of solution for in equation $|x+1| + |x| > 3$.
 (a) $(-2, 1)$ (b) $(-\infty, 1) \cup (2, \infty)$ (c) $(-\infty, -2) \cup (1, \infty)$ (d) can't be determined
27. Set of solution for in equation $\left|\frac{x}{x-4}\right| > 1, x \neq 4$
 (a) $(6, \infty)$ (b) $(-\infty, 2)$ (c) $[2, 6]$ (d) none of these
28. If $f(x) = |x - 1|$ then minimum value of the function will be:
 (a) 1 (b) can't be determined (c) 0 (d) -1
29. The equation of the locus of a point equidistance from the points (1, 3, 2) and (4, 5, 6) will be given as:
 (a) $4x + 6y + 8z = 63$ (b) $6x - 4y + 8z + 63 = 0$ (c) $6x + 4y - 8z - 63 = 0$ (d) none of these
30. If $2f(x) - 3f\left(\frac{1}{x}\right) = x^2$ then find the value of $f(2)$.
 (a) $-\frac{7}{4}$ (b) $\frac{5}{2}$ (c) -1 (d) none of these

PHYSICS

31. A bullet of mass 40 g moving with a speed of 90 ms^{-1} enters a heavy wooden block and is stopped after a distance of 60 cm. The average resistive force exerted by the block on the bullet is
(a) 180 N (b) 220 N (c) 270 N (d) 320 N
32. A mass of 2Kg travelling with 10m/s collides with spring of constant 100N/m, then the maximum compression of spring is:
(a) 1m (b) 1.4m (c) 2m (d) 2.25m
33. An object A of mass 5kg moving with velocity of 10 m/s collides elastically with other mass B of 5kg at rest, then:
(a) Both A & B moves with 10 m/s (b) A comes to rest, B moves with 10 m/s
(c) A & B come to rest. (d) None of the above
34. A 80 kg man runs up a staircase of 4m in 8 s. If the value of acceleration due to gravity is 10 m/s^2 , then his average power output is
(a) 400 W (b) 800 W (c) 1600 W (d) 3200 W
35. A 4 kg mass and a 1 kg mass are moving with equal kinetic energies. The ratio of their momentum is
(a) 3 : 1 (b) 1 : 1 (c) 4 : 1 (d) 2 : 1
36. Which of the following describes lever of second class?



37. A cricketer while playing a stroke swings the bat with some velocity, then chose the right statement:
(a) The handle and end of bat moves with same linear velocity.
(b) The handle has lower linear velocity than end of the bat.
(c) The end of bat has lower linear velocity than the handle.
(d) The velocities will depend on the mass of the bat.
38. How does the weight of a body vary while moving from the earth to the moon?
(a) It gradually decreases till it reaches the moon surface
(b) It gradually increases till it reaches the moon surface
(c) First it gradually decreases to zero value and then increases till it reaches the moon surface
(d) First it gradually increases and then decreases till it reaches the moon surface.

39. There is no air on the surface of moon because:
 (a) Escape velocity of moon is less than the velocity of air molecule
 (b) Escape velocity of moon is more than the velocity of air molecule
 (c) There is no gravity on moon
 (d) All of the above
40. The escape velocity of a body on the surface of the earth is 11.2 km/s. What is the escape velocity of the body on the surface of a planet which is 32 times as heavy as the earth and whose radius is twice the radius of the earth?
 (a) 11.2 km/s (b) 44.8 km/s (c) 31.7 km/s (d) 179.2 km/s
41. A person having mass of 80Kg stands on weighing machine in a lift, if lift starts to accelerate upwards with 4 m/s^2 , then the weight of person read in weighing machine is ($g = 10 \text{ m/s}^2$)
 (a) 100Kgf (b) 112 Kgf (c) 48 Kgf (d) 0 Kgf
42. The densities of three liquids are D, 2D and 3D. What will be the density of the resulting mixture, if equal volumes of the three liquids are mixed?
 (a) 6D (b) 1.4 D (c) 2D (d) 3D
43. A stone weighing 750 g appears to weigh only 500 g when it is submerged in water of density 1 g/cc . The volume of the stone is
 (a) 250 cc (b) 500 cc (c) 750 cc (d) 1000 cc
44. Shown in the figure are two hollow cubes C_1 and C_2 of negligible mass partially filled with liquids of densities ρ_1 and ρ_2 respectively, floating in water of density ρ_w , then:
- 
- (a) $\rho_2 < \rho_w < \rho_1$
 (b) $\rho_2 < \rho_1 < \rho_w$
 (c) $\rho_1 < \rho_2 < \rho_w$
 (d) $\rho_1 < \rho_w < \rho_2$
45. Airplanes fly on the basis of which principle?
 (a) Newton First Law (b) Archimedes Principle
 (c) Stokes Law (d) Bernoulli's Principle
46. A water proofing agent changes the angle of contact from
 (a) $\frac{\pi}{2}$ to an obtuse (b) an obtuse to an acute value
 (c) acute to $\frac{\pi}{2}$ (d) an acute to an obtuse value
47. Which the temperature of a liquid increases, then the surface tension of the liquid
 (a) increases (b) decreases
 (c) remains the same (d) first increases and then decreases

48. A vessel contains oil of density 0.8 gm/cm^3 over mercury of density 13.6 gm/cm^3 . A homogeneous sphere floats with half of its volume immersed in mercury and the other half in oil. The density of the material of the sphere in CGS unit is
(a) 3.3 (b) 6.4 (c) 7.2 (d) 12.8
49. Water flows out of the hole of a bucket and follows a parabolic path. If the bucket falls freely under gravity, the water flow (ignoring air resistance).
(a) follows a straight-line path relative to the falling bucket
(b) follows a parabolic path relative to the falling bucket
(c) stops
(d) decreases but continues to flow
50. Two wires of the same radius and material have their lengths in the ratio 1 : 2. If these are stretched by the same force, then the strain produced in the two wires will be in the ratio
(a) 4 : 1 (b) 1 : 2 (c) 4 : 2 (d) 1 : 1

CHEMISTRY

51. Among halogens, the correct order of amount of energy released in electron gain (electron gain enthalpy) is:
(a) $F > Cl > Br > I$ (b) $F < Cl < Br < I$ (c) $F < Cl > Br > I$ (d) $F < Cl < Br < I$
52. In the modern periodic table, the period indicates the value of:
(a) Atomic number (b) Atomic mass
(c) Principal quantum number (d) Azimuthal quantum number.
53. The elements in which electrons are progressively filled in 4f-orbital are called
(a) actinoids (b) transition elements (c) lanthanoids (d) halogens
54. Which of the following molecule has net dipole moment?
(a) CO_2 (b) H_2O (c) BF_3 (d) CH_4
55. Which of the following statements about a compound is incorrect?
(a) A molecule of a compound may have atoms of different elements.
(b) A compound cannot be separated into its constituent elements by physical methods of separation.
(c) A compound retains the physical properties of its constituent elements.
(d) The ratio of atoms of different elements in a compound is fixed.
56. Which one of the following statements is NOT correct?
(a) Water of crystallization is the fixed number of water molecules present in one formula unit of a salt
(b) The molecular formula of Plaster of Paris is $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
(c) Washing soda is used for removing the permanent hardness of water
(d) The atmosphere of Venus is made up of thick white and yellow clouds of sulphuric acid
57. Which one of the following salts is responsible for temporary hardness of water?
(a) Sulphates of calcium (b) Chlorides of magnesium
(c) Bicarbonates of magnesium (d) Sulphates of magnesium

58. Common salt (NaCl) is not used as a raw material for preparation of which one of the following compounds?
- (a) Bleaching powder (b) Baking soda
(c) Plaster of Paris (d) Washing soda
59. Solder is an alloy of:
- (a) Cu & Sn (b) Fe & Zn (c) Pb & Sn (d) Ag & Zn
60. The desirable range of pH for drinking water is
- (a) 6.5 to 8.5 (b) 5 to 6.5 (c) 6.5 to 7 (d) 7 to 8.5
61. Biological catalysts are protein molecules which
1. speed up a chemical reaction.
 2. remain unchanged after reaction
 3. function optimally at 37°C
 4. do not have an enzymatic activity.
- Select the correct answer using the code given below:
- (a) 1 only (b) 1, 2 and 3 (c) 2 and 3 only (d) 1, 3 and 4
62. Which one of the following materials is not an allotrope of carbon?
- (a) Diamond (b) Graphene (c) Fly ash (d) Fullerene
63. The temperature at which "vapour pressure of the liquid in an open vessel becomes equal to the atmospheric pressure" is called
- (a) Melting point (b) Boiling point (c) Liquid point (d) None of the above
64. Which one of the following is NOT a chemical change?
- (a) Burning of coal (b) Rusting of metal (c) Melting of ice (d) Reaction of acid with base
65. Which one of the following wavelength radiations may correspond to an X – ray?
- (a) 1 nm (b) 10 nm (c) 100 nm (d) 300 nm
66. Which one of the following is an endothermic reaction?
- (a) $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{O}_2(\text{g})$
(b) $\text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) + 6\text{O}_2(\text{g}) \rightarrow 6\text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\text{l})$
(c) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
(d) $2\text{Pb}(\text{NO}_3)_2(\text{s}) \rightarrow 2\text{PbO}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
67. Which one of the following statements is NOT correct?
- (a) Diamond is hard due to extended covalent bonding in it
(b) Fullerene is composed of five and six membered rings
(c) Diamond is a good conductor of electricity
(d) Graphite is used as a lubricant
68. The temperature of a body increases from 310 K to 340 K. What is the increase in temperature in degree Celsius?
- (a) 20°C (b) 30°C
(c) 37°C (d) 67°C

69. Match List I with List II and select the answer using the code given below the Lists:

List I

(Reaction)

- A. $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$
 B. $\text{CaCO}_3 \text{ (s)} \rightarrow \text{CaO (s)} + \text{CO}_2 \text{ (g)}$
 C. $\text{Pb (s)} + \text{CuCl}_2 \text{ (aq)} \rightarrow \text{PbCl}_2 \text{ (aq)} + \text{Cu (s)}$
 D. $\text{Na}_2\text{SO}_4 \text{ (aq)} + \text{BaCl}_2 \text{ (aq)} \rightarrow \text{BaCl}_2 \text{ (s)} + 2 \text{ NaCl (aq)}$

List II

(Type)

1. Single displacement
 2. Double displacement
 3. Combination
 4. Decomposition

Code:

	A	B	C	D
(a)	2	1	4	3
(b)	2	4	1	3
(c)	3	4	1	2
(d)	3	1	4	2

70. The pair of ions having same electronic configuration is:

- (a) Cr^{3+} , Fe^{3+} (b) Fe^{3+} , Mn^{2+}
 (c) Fe^{3+} , Co^{3+} (d) Sc^{3+} , Cr^{3+}

**ENGLISH
IDIOMS**

71. **Back to the drawing board!** –

- (a) Attempts have failed (b) to start over again
 (c) use different method (d) done a poor job

72. **An Arm and A Leg** –

- (a) very exorbitant (b) Very costly
 (c) expensive (d) all of the above

73. **Cut to the chase** –

- (a) Getting to the point (b) giving non-essential information
 (c) stop the chase (d) chase somebody

74. I am going to stay at home because I am **feeling under the weather** today.

- (a) unhappy (b) depressed (c) irritated (d) sick

75. **A doubting Thomas**–

- (a) doubtful (b) deceptive (c) A sceptic (d) A conformist

SYNONYMS

76. **THRIVE**–

- (a) destroy (b) flourish (c) raise (d) create

77. **FETCH**–

- (a) order (b) bring (c) scoop (d) take

78. **GARRULOUS**–

- (a) talkative (b) sedative (c) vocative (d) positive

79. **ADVERSITY**–

- (a) opponent (b) misfortune (c) adversary (d) hostility

80. **QUICKEN**-a) accelerate b) delay c) hinder d) stop

ANTONYMS

81. **Withdraw-**

(a) reduce (b) need (c) advance (d) want

82. **Secret-**

(a) friendly (b) covert (c) hidden (d) overt

83. **Heartfelt-**

(a) loving (b) insincere (c) unhealthy (d) humorous

84. **Impartial-**

(a) hostile (b) biased (c) dislike (d) worried

85. **Luminous-**

(a) clear (b) dim (c) brittle (d) clever

PAIRED WORDS

86. The soldier showed great -----in the face of danger.

a) valor b) valour c) value d) valance

87. The doctor tried to ----- the patient that the operation would be successful.

a) assure b) ensure c) insure d) secure

88. The speaker's -----to Shakespeare was lost on many in the audience. –

a) allusion b) illusion c) delusion d) elusion

89. The principal will not -----any late submissions after the deadline.

a) except b) accept c) accent d) ascent

90. His actions were ----- and shocked even the most liberal of thinkers.

a) immoral b) amoral c) unmoral d) non-moral

IDENTIFICATION OF PARTS OF SPEECH

91. Nathan is finishing his chores early so that he can enjoy the rest of the day. –

(a) Conjunction (b) Interjection (c) Pronoun (d) Verb

92. Honesty is a desirable characteristic trait. –

(a) Adjective (b) Noun (c) Pronoun (d) Verb

93. Samantha forgot to bring her homework to school.

(a) Adjective (b) Determiner (c) Noun (d) Pronoun

94. The storm uprooted the eight-foot tree.

(a) Adverb (b) Adjective (c) Verb (d) Noun

95. Many students are excited about the class trip.

(a) Noun (b) Determiner (c) Pronoun (d) Verb

GAT

96. Article 21 guarantees:

(a) Right to life and personal liberty (b) Right to equality
(c) Right to education (d) Right against exploitation

97. PM-KUSUM scheme is related to:
(a) Solar energy in agriculture (b) Rural housing
(c) Industrial finance (d) MSMEs
98. Bharatmala Pariyojana focuses on:
(a) Highways development (b) Rural roads
(c) Rail freight (d) Border area roads
99. Gini coefficient is a measure of:
(a) Poverty (b) Income inequality
(c) GDP growth (d) Inflation
100. The "Garibi Hatao" slogan was given during which Five-Year Plan?
(a) Fourth Plan (b) Fifth Plan (c) Sixth Plan (d) Seventh Plan
101. Which state is the largest producer of wheat in India?
(a) Uttar Pradesh (b) Punjab (c) Haryana (d) Madhya Pradesh
102. Largest vegetable-producing state in India:
(a) Uttar Pradesh (b) West Bengal (c) Bihar (d) Madhya Pradesh
103. The Law of Demand states that:
(a) Price ↑, Demand ↑ (b) Price ↑, Demand ↓ (c) Price ↓, Demand ↓ (d) None of the above
104. The term Budget in India refers to:
(a) Annual financial statement of the government
(b) Monetary policy statement
(c) Fiscal deficit report
(d) Five-year plan
105. Which part of the budget shows revenue and expenditure?
(a) Capital budget (b) Revenue budget (c) Fiscal budget (d) Performance budget
106. GST was introduced in India through which Constitutional Amendment Act?
(a) 99th Amendment (b) 100th Amendment (c) 101st Amendment (d) 102nd Amendment
107. CGST is collected by:
(a) State Government (b) Central Government
(c) Both (d) RBI
108. The 12th Five-Year Plan period was:
(a) 2007–2012 (b) 2010–2015
(c) 2012–2017 (d) 2015–2020
109. The Himalayas were formed due to the collision of which two tectonic plates?
(a) Eurasian Plate and Arabian Plate
(b) Indian Plate and Eurasian Plate
(c) Indo-Australian Plate and Pacific Plate
(d) African Plate and Eurasian Plate

110. The President is elected by:
(a) Direct election by people (b) Electoral college
(c) Parliament only (d) State Legislatures only
111. The Gulf of Mannar is located between:
(a) Tamil Nadu and Kerala (b) Tamil Nadu and Sri Lanka
(c) Andhra Pradesh and Odisha (d) Kerala and Lakshadweep
112. The western boundary of the Thar Desert touches which international border?
(a) Nepal (c) China (c) Bangladesh (d) Pakistan
113. Earthquakes in India are most common in which region?
(a) Thar Desert (b) Gangetic Plain (c) Himalayas (d) Deccan Plateau
114. What does NDMA stand for?
(a) National Disaster Management Authority
(b) National Defence Monitoring Agency
(c) National Development Management Act
(d) National Department for Meteorology Agency
115. Which type of rock is formed by the cooling of magma?
(a) Sedimentary (b) Igneous (c) Metamorphic (d) Alluvial
116. Which planet is known for having a Great Red Spot?
(a) Earth (b) Saturn (c) Jupiter (d) Venus
117. Article 14 guarantees:
(a) Equality before law (b) Equal protection of laws
(c) Both A and B (d) Equality of opportunity
118. Which Article abolishes untouchability?
(a) Article 15 (b) Article 16 (c) Article 17 (d) Article 18
119. The Governor-General of Bengal became Governor-General of India under:
(a) Charter Act, 1793 (b) Charter Act, 1813
(c) Charter Act, 1833 (d) Charter Act, 1853
120. Lok Sabha is also called:
(a) Upper House (b) House of People (c) Council of States (d) House of Commons