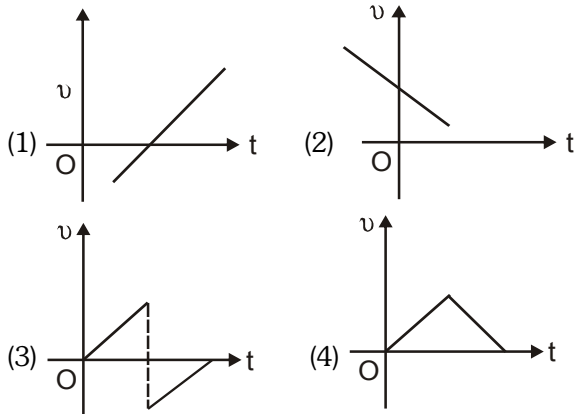


There are 100 questions in this paper. Each question carries 1 mark.

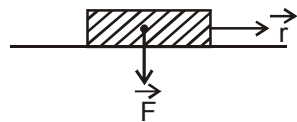
1. The velocity-time graph of a body falling from rest under gravity and rebounding from a solid surface is represented by



2. The gravitational force between two objects of mass 1 kg each, separated by a distance of 1 m in vacuum will be

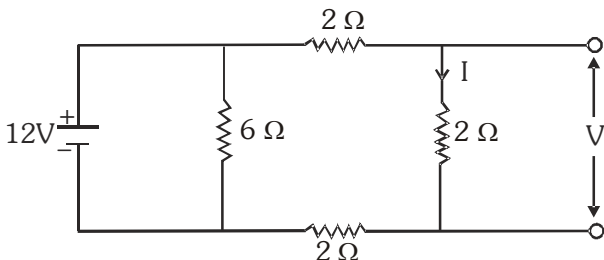
- (1) zero (2)  $6.675 \times 10^{-11} \text{ N}$   
 (3)  $13.350 \times 10^{-11} \text{ N}$  (4)  $3.337 \times 10^{-11} \text{ N}$

3. The force  $F$  is acting on an object of mass  $m$ . The direction of displacement ( $\vec{r}$ ) and force ( $\vec{F}$ ) for the object is shown by an arrow in the figure. Work done on the object by the force  $F$  will be



- (1) positive  
 (2) negative  
 (3) zero  
 (4) either positive or negative

4. The value of current  $I$  and voltage  $V$  in the given circuit will be



- (1) 2A, 4V (2) 4A, 2V (3) 1A, 2V (4) 2A, 1V

5. Lenz's law is a consequence of the law of conservation of

- (1) momentum (2) charge  
 (3) angular momentum (4) energy

6. For hearing distinct echoes, the minimum distance of the obstacle from the source of sound must be (Given velocity of sound = 344 m/s)

- (1) 17.2 m (2) 34.4 m  
 (3) 172 m (4) 344 m

7. Three equal resistors connected in series across a source of  $V$  voltage together dissipates 5 W power. If the same resistors are connected in parallel across the same source of voltage  $V$ , the power dissipated will be

- (1) 20 W (2) 25 W  
 (3) 40 W (4) 45 W

8. Every hot object emits

- (1) infrared rays (2) visible rays  
 (3) X-rays (4) ultraviolet rays

9. A bullet of mass 10 g travelling horizontally with a velocity of  $160 \text{ ms}^{-1}$  strikes a stationary wooden block and comes to rest in 0.02 s. The distance of penetration of the bullet into the block will be

- (1) 1.20 m (2) 1.60 m (3) 2.00 m (4) 2.40 m

10. The correct relation between  $u$ ,  $v$  and  $r$  for a lens will be

(symbols represent traditional meaning)

(1)  $r = \frac{2uv}{u-v}$  (2)  $r = \frac{uv}{2(u-v)}$

(3)  $r = \frac{1}{u+v}$  (4)  $\frac{1}{r} = \frac{1}{u} + \frac{1}{v}$

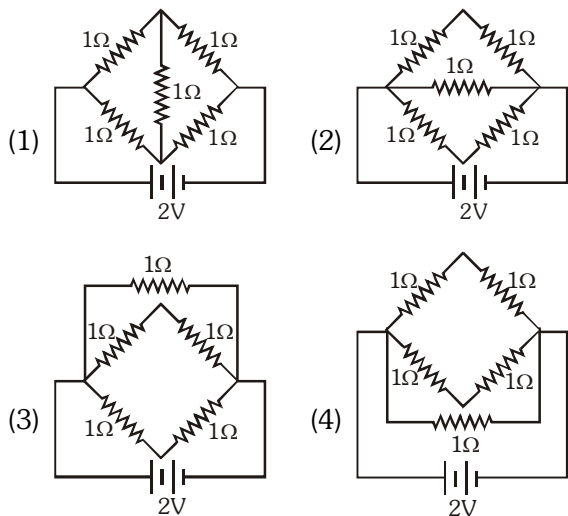
11. When a body is immersed in a liquid, the buoyant force that acts on the body will be

- (1) vertically downwards (2) vertically upwards  
 (3) horizontally right side (4) horizontally left side

12. The distance between the objective lens and the eye-piece of an astronomical telescope will be

- (1)  $\frac{f_o}{f_e}$  (2)  $\frac{f_e}{f_o}$   
 (3)  $f_o + f_e$  (4)  $f_o - f_e$

13. Which of the following network yields minimum current ?



14. Biogas is produced from biomass by  
 (1) anaerobic fermentation  
 (2) destructing distillation  
 (3) fractional distillation  
 (4) mixing petrol in biomass
15. Salt made of non-metallic elements only is  
 (1) NaCl (2) NH<sub>4</sub>Cl (3) AlN (4) MgCl<sub>2</sub>
16. By which property are gases and liquids different from solid ?  
 (1) Volume (2) Mass  
 (3) Conductivity (4) Fluidity
17. The action of cleaning of oily dirt by soap is based on  
 (1) solubility in water  
 (2) hydrophilic property  
 (3) hydrophobic property  
 (4) presence of both hydrophilic and hydrophobic groups
18. Adding an alpha particle to nucleus of sodium atom, product will be  
 (1) Na<sup>+</sup> (2) Mg<sup>2+</sup> (3) Al<sup>2+</sup> (4) Al
19. Benzene has \_\_\_\_\_ number of covalent bonds.  
 (1) 6 (2) 9 (3) 12 (4) 15
20. False statement for second period elements is  
 (1) change in number of electrons produces ions  
 (2) numbers of protons and electrons are equal in neutral atom

- (3) number of neutrons is less than the number of protons in atoms  
 (4) change in the number of neutrons in atom produces isotopes

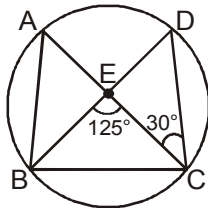
21. Which metal cannot displace hydrogen from dilute acids ?  
 (1) Cu (2) Mg (3) Zn (4) Na
22. At room temperature liquid non-metal is  
 (1) carbon (2) bromine (3) mercury (4) iodine
23. Neutronless neutral atom is  
 (1) H (2) He (3) Na (4) K
24. Displacement reaction is  
 (1) CaO (s) + H<sub>2</sub>O(l) → Ca(OH)<sub>2</sub> (aq)  
 (2) Pb(s) + CuCl<sub>2</sub>(aq) → PbCl<sub>2</sub>(aq) + Cu(s)  
 (3) MnO<sub>2</sub>(s) + 4HCl(l) → MnCl<sub>2</sub>(s) + 2H<sub>2</sub>O(l) + Cl<sub>2</sub>(g)  
 (4) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> + 6O<sub>2</sub> → 6CO<sub>2</sub> + H<sub>2</sub>O
25. pH of soda water is  
 (1) 7 (2) < 7 (3) > 7 (4) 0
26. Which of the following has maximum number of molecules?  
 (1) 7 grams nitrogen (g)  
 (2) 23 grams nitrous oxide (g)  
 (3) 2 grams Hydrogen (g)  
 (4) 16 grams oxygen (g)
27. Select the incorrect statement.  
 (1) C<sub>3</sub>H<sub>8</sub> does not have any isomer.  
 (2) HCOOCH<sub>3</sub> and CH<sub>3</sub>COOH are not same organic compounds.  
 (3) There is no organic compound with formula CH<sub>2</sub>O.  
 (4) C<sub>3</sub>H<sub>4</sub> has two π – bonds.
28. Three crops that contribute maximum to global foodgrain production are  
 (1) Wheat, Rice and Maize  
 (2) Wheat, Rice and Barley  
 (3) Wheat, Maize and Sorghum  
 (4) Rice, Maize and Sorghum
29. Cell organelle 'Bioplast' was given another name by Benda, which is  
 (1) Chloroplast (2) Mitochondria  
 (3) Ribosome (4) Lysosome

- 30.** In plants abscisic acid controls  
 (1) growth in shoot (2) flower formation  
 (3) cell division (4) fall of leaf
- 31.** Gambusia is a fish which is being introduced into the ponds in order to check the vector borne diseases such as  
 (1) dengue (2) malaria  
 (3) chikungunya (4) all of these
- 32.** The use of disposable paper-cups is more beneficial over disposable plastic-cups because  
 (1) it is cheaper  
 (2) it is easily available  
 (3) it can be reused  
 (4) its recycling process has no harmful impact on environment
- 33.** The endosperm of angiosperms is  
 (1) haploid (2) diploid  
 (3) triploid (4) polyploid
- 34.** The author of the book 'Systema Naturae' is  
 (1) Lamarck (2) Darwin  
 (3) Theophrastus (4) Carolus Linnaeus
- 35.** In which of the following animals joined legs are not found?  
 (1) Palaemon (2) Scorpion  
 (3) Housefly (4) Leech
- 36.** Which of the following diseases is not related with sexual transmission?  
 (1) Syphilis (2) Gonorrhoea  
 (3) Allergy (4) AIDS
- 37.** Which of the following enzymes is related with digestion of protein?  
 (1) Lipase (2) Pepsin  
 (3) Sucrase (4) Amylase
- 38.** The structure that connects a bone with muscles is known as  
 (1) Tendon (2) Cartilage  
 (3) Ligament (4) Areolar tissue
- 39.** Cell structure that allows certain substances to enter or come out from the cell is  
 (1) Ribosome (2) Plasma membrane  
 (3) Centrosome (4) Golgi body
- 40.** Which of the options given below would not work in the following sentence?  
 In order for the body to absorb and use \_\_\_\_\_ these must be broken down by hydrolysis into \_\_\_\_\_.  
 (1) polysaccharides, monosaccharides  
 (2) amino acids, proteins  
 (3) fats, glycerol and fatty acids  
 (4) disaccharides, monosaccharides
- 41.** If  $x, y, z$  are positive real numbers and  $a, b, c$  are rational numbers, then the value of  

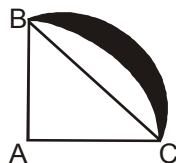
$$\frac{1}{1+x^{b-a}+x^{c-a}} + \frac{1}{1+x^{a-b}+x^{c-b}} + \frac{1}{1+x^{b-c}+x^{a-c}}$$
 is  
 (1) -1 (2) 0  
 (3) 1 (4) None of these
- 42.** If 3 is the least prime factor of number  $a$  and 7 is the least prime factor of number  $b$ , then the least prime factor of  $a + b$  is  
 (1) 2 (2) 3 (3) 5 (4) 10
- 43.** If 9,  $a, b - 6$  are in Arithmetic progression, then  $a + b =$   
 (1) 1 (b) 5 (3) 15 (4) 3
- 44.** If 2 is a root of the equation  $x^2 + bx + 12 = 0$  and the equation  $x^2 + bx + q = 0$  has equal roots, then  $q =$   
 (1) 8 (2) -8  
 (3) 16 (4) -16
- 45.** If  $\sin \theta - \cos \theta = \sqrt{2} \sin(90^\circ - \theta)$ , then  $\tan \theta =$   
 (1)  $\sqrt{2} - 1$  (2)  $\sqrt{2}$   
 (3)  $1 - \sqrt{2}$  (4)  $\sqrt{2} + 1$
- 46.** If  $a \cos \theta - b \sin \theta = c$ , then  $a \sin \theta + b \cos \theta =$   
 (1)  $\pm\sqrt{a^2 + b^2 + c^2}$  (2)  $\pm\sqrt{a^2 + b^2 - c^2}$   
 (3)  $\pm\sqrt{c^2 - a^2 - b^2}$  (4) None of these
- 47.** From the top of a 7 m high building, the angle of elevation of the top of a cable tower is  $60^\circ$  and the angle of depression of its foot is  $45^\circ$ . The height of the tower in metre is  
 (1)  $7(\sqrt{3} - 1)$  (2)  $7\sqrt{3}$   
 (3)  $7 + \sqrt{3}$  (4)  $7(\sqrt{3} + 1)$

48. If the system of equations  $kx + 3y - (k - 3) = 0$ ,  $12x + ky - k = 0$  has infinitely many solutions, then  $k =$   
 (1) 6 (2) -6  
 (3) 0 (4) None of these
49. The median of first 12 prime numbers is  
 (1) 13 (2) 14 (3) 15 (4) 17
50. A die is thrown twice. The probability that 5 will not come up either of the time is  
 (1)  $\frac{35}{36}$  (2)  $\frac{25}{36}$  (3)  $\frac{1}{36}$  (4)  $\frac{11}{36}$

51. If the diameter of a sphere is decreased by 25%, by what percent does its curved surface area decrease?  
 (1) 43.75% (2) 21.88% (3) 50% (4) 25%
52. In figure, A, B, C and D are four point on a circle. AC and BD intersect at a point E such that  $\angle BEC = 125^\circ$  and  $\angle ECD = 30^\circ$ . Then  $\angle BAC =$



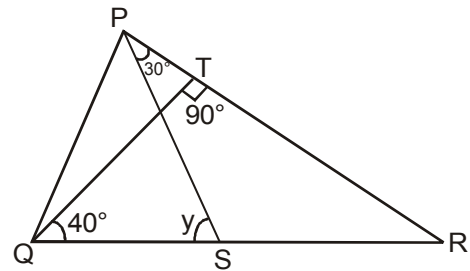
- (1)  $95^\circ$  (2)  $110^\circ$  (3)  $85^\circ$  (4)  $105^\circ$
53. ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is  
 (1) 2 : 1 (2) 1 : 2  
 (3) 4 : 1 (4) 1 : 4
54. In  $\triangle ABC$ ,  $AB = 6\sqrt{3}$  cm,  $AC = 12$  cm and  $BC = 6$  cm. The angle B is  
 (1)  $120^\circ$  (2)  $60^\circ$  (3)  $90^\circ$  (4)  $45^\circ$
55. In figure, ABC is a quadrant of a circle of radius 14 cm and a semicircle is drawn with BC as diameter. The area of the shaded region is



- (1)  $98 \text{ cm}^2$  (2)  $154 \text{ cm}^2$   
 (3)  $56 \text{ cm}^2$  (4) None of these

56. The ratio of the volume of a cube to that of a sphere which exactly fits inside the cube is  
 (1)  $6 : \pi$  (2)  $\pi : 6$  (3)  $\pi : 12$  (4)  $12 : \pi$
57. If  $\alpha, \beta$  are the zeros of polynomial  $f(x) = x^2 - p(x + 1) - c$ , then  $(\alpha + 1)(\beta + 1) =$   
 (1)  $c - 1$  (2)  $1 - c$  (3)  $c$  (4)  $1 + c$
58. The area of a triangle is 5 square units. Two of its vertices are (2, 1) and (3, -2). The third vertex lies on  $y = x + 3$ . The third vertex is  
 (1)  $(\frac{7}{2}, \frac{3}{2})$  (2)  $(-\frac{3}{2}, \frac{3}{2})$   
 (3)  $(-\frac{3}{2}, \frac{13}{2})$  (4)  $(\frac{7}{2}, \frac{5}{2})$

59. In figure, if  $QT \perp PR$ ,  $\angle TQR = 40^\circ$  and  $\angle SPR = 30^\circ$ , then  $y$  is



- (1)  $70^\circ$  (2)  $110^\circ$  (3)  $90^\circ$  (4)  $80^\circ$
60.  $(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta)$  is equal to  
 (1) 0 (2) 2 (3) 1 (4) -1
61. The club which was most successfully constituted by the men and women of France, after the Constitution of 1791.  
 (1) Liberty club (2) Zollverein  
 (3) Jacobin club (4) Equality club
62. The great Indians who were influenced by the thoughts of French Revolution were  
 (1) Haider Ali & Tipu Sultan  
 (2) Tipu Sultan & Raja Rammohan Roy  
 (3) Lala Lajpat Rai & Tilak  
 (4) Bahadur Shah Jafar & Laxmibai
63. The use of wood was much needed in 1850s to spread the Indian Railway tracks. It was used  
 (1) in Buildings (2) in Railway wagons  
 (3) in Furniture (4) in Sleepers
64. The shepherds of Himachal Pradesh are called  
 (1) Gujjar (2) Gaddi (3) Bakarwal (4) Bhotia

- 65.** Kosovo was a province of which country before splitting?  
 (1) Yugoslavia (2) France  
 (3) USSR (4) US
- 66.** The institution like Indian Parliament that was established after the French Revolution in France was  
 (1) Duma (2) Zollverein  
 (3) House of Lords (4) National Assembly
- 67.** The founder of 'Hoa Hao' movement in Vietnam was  
 (1) Confucius (2) Laotse  
 (3) Huynh Pho So (4) Liang Qichao
- 68.** In which Conference were International Monetary Fund and World Bank established ?  
 (1) Brussels (2) Bretton Woods  
 (3) Vienna (4) Washington
- 69.** Bombay was a group of how many islands in 17th Century ?  
 (1) Seven (2) Nine (3) Eleven (4) Five
- 70.** In which text did Jyotiba Phule write about the injustices of Caste system ?  
 (1) Amar Jivan (2) Gulamgiri  
 (3) Indirabad (4) Indralkha
- 71.** Hill station located in Palani Hills is  
 (1) Panchmarhi (2) Kodaikanal  
 (3) Udagamandalam (4) Panchgani
- 72.** The correct pair amongst the following is  
 (1) Chamba – River Chenab  
 (2) Kanchipuram – River Parvati  
 (3) Nanded – River Godavari  
 (4) Ujjain – River Son
- 73.** Match the following column :

|     | Column - I  |       | Column - II                |
|-----|-------------|-------|----------------------------|
| (A) | Uttarakhand | (i)   | Sariska Wildlife Sanctuary |
| (B) | Assam       | (ii)  | Periyar Tiger Reserve      |
| (C) | Rajasthan   | (iii) | Manas Tiger Reserve        |
| (D) | Kerala      | (iv)  | Corbett National Park      |

- A B C D
- (1) iii iv ii i  
 (2) iv ii i iii  
 (3) iii i iv ii  
 (4) iv iii i ii

- 74.** By using code, arrange the following cities of India from south to north :  
 (A) Amritsar (B) Anantapur  
 (C) Alwar (D) Amaravati  
 (1) B, C, D, A (2) B, D, C, A  
 (3) D, C, B, A (4) D, B, A, C
- 75.** 'Mango showers' are  
 (1) Western disturbances in Punjab and Himachal Pradesh  
 (2) Rainfall by north-east trade winds in coastal Tamil Nadu  
 (3) Pre monsoon rains in Kerala and Karnataka  
 (4) Cloud burst in Khasi hills.
- 76.** Consider the following statements :  
 Assertion (A) : Manganese is used in the manufacturing of steel.  
 Reason (R) : Nearly 10 kilogram of manganese is needed to make one tonne of steel.  
 Select the correct option from the given alternatives.  
 (1) (A) is true, but (R) is false  
 (2) Both (A) and (R) are true and (R) is the correct explanation of (A)  
 (3) Both (A) and (R) are true, but (R) is not the correct explanation of (A)  
 (4) Both (A) and (R) are false.
- 77.** Where is the national headquarters of Software Technology Parks of India ?  
 (1) Bengaluru (2) Chennai  
 (3) New Delhi (4) Pune
- 78.** National Highway -7 passes through how many states of India ?  
 (1) 6 (2) 5 (3) 8 (4) 7
- 79.** Consider the following statements and choose the correct option  
 Statement I : Humus content is less in Laterite soils.  
 Statement II : Red laterite soils are suitable for crops of cashewnut.  
 Statement III : Laterite soils are found in Kerala and Tamil Nadu.  
 (1) Statement I and Statement II are true, but Statement III is false  
 (2) Statement II and Statement III are true, but Statement I is false  
 (3) Statement I and Statement III are true, but Statement II is false  
 (4) All the three statements are true.

80. According to Census 2011, the state having highest density of population is

- (1) Kerala (2) West Bengal  
(3) Uttar Pradesh (4) Bihar

81. Match List - I with List - II and select the correct answer :

|     | List - I  |       | List - II            |
|-----|---|-------|----------------------|
| (A) | Division of powers among organs of government   | (I)   | Community government |
| (B) | Division of powers between Centre and States    | (II)  | Coalition government |
| (C) | Sharing of powers among different social groups | (III) | Separation of powers |
| (D) | Sharing of powers between two or more than two  | (IV)  | Federal government   |

A B C D

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

82. The organ of government which makes laws is

- (1) Legislature (2) Executive  
(3) Judiciary (4) Press

83. The institution in which  $\frac{1}{3}$ rd reservation for women has been constitutionally given, is

- (1) Lok Sabha  
(2) State Legislature  
(3) Panchayati Raj institution  
(4) Judiciary

84. Which right of the Constitution of India negates the bonded labour and child labour ?

- (1) Right to equality  
(2) Right to liberty  
(3) Right to religious freedom  
(4) Right against exploitation.

85. How many seats are reserved for Scheduled Castes in the Lok Sabha ?

- (1) 84 (2) 47 (3) 32 (4) 22

86. 'Maharashtrawadi Gomantak party' is related to which state ?

- (1) Maharashtra (2) Goa  
(3) Kerala (4) Andhra Pradesh

87. Who was the editor of 'Young India' magazine ?

- (1) Jawaharlal Nehru  
(2) Gopal Krishna Gokhale  
(3) Mahatma Gandhi  
(4) Bal Gangadhar Tilak

88. Which country holds 'Veto Power' in United Nations?

- (1) Germany (2) Japan  
(3) Italy (4) France

89. Which state was created on the basis of culture, geography and ethnicity ?

- (1) Uttarakhand (2) Punjab  
(3) Gujarat (4) Maharashtra

90. Match List - I with List - II and select the correct answer :

|     | List - I                              |       | List - II              |
|-----|---------------------------------------|-------|------------------------|
| (A) | Organisation of employees             | (I)   | Narmada Bachao Andolan |
| (B) | Long term movement                    | (II)  | Asom Gana Parishad     |
| (C) | Support to common or general interest | (III) | FEDECOR                |
| (D) | Political party                       | (IV)  | BAMCEF                 |

A B C D

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

91. Which work of the following is an economic activity?

- (1) Teacher teaches his son  
(2) Service rendered by a wife to her sick husband  
(3) Service to a patient rendered by a nurse  
(4) Growing vegetables in kitchen garden.

92. People deposit money in the bank because

- (A) Get interest  
(B) Money remains secured  
(C) Money is used in country's development  
(D) Value of money increases

- (1) A and B (2) B and C  
(3) A, B and C (4) A, B, C and D

- 93.** Which of the following statements are true for National Rural Employment Guarantee Act ?  
(A) Right to work with guarantee of job  
(B) 100 days employment in a year  
(C) Implemented in all the regions of the country  
(D) Provision of unemployment allowances  
(1) A, B and C                      (2) B, C and D  
(3) A, B and D                      (4) A, B, C and D
- 94.** Since five years Lalita's father is working in Government school as a teacher. To purchase goods from a government ration shop which of the following cards should he possess ?  
(1) BPL card  
(2) APL card  
(3) Aadhar card  
(4) Antyodaya card
- 95.** Which of the following statements are true for mid-day meal scheme ?  
(A) Increase in attendance of children in school  
(B) Improvement in nutrition status of the children  
(C) Improvement in examination results of the children  
(D) Increase the interest towards games in the children.  
(1) A and B                      (2) B and C  
(3) A and D                      (4) C and D
- 96.** In India seats are reserved for women in which of the following bodies?  
(1) Lok Sabha  
(2) State Legislative Assemblies  
(3) Panchayati Raj  
(4) Cabinet
- 97.** Which type of challenge is being faced by most of the democracies of the world?  
(1) Foundational challenge  
(2) Challenge of expansion  
(3) Challenge of deepening of democracy  
(4) None of these
- 98.** The Judges of Supreme Court are appointed by  
(1) President  
(2) Prime Minister  
(3) Auditor General  
(4) Law Minister
- 99.** What is a public Interest Litigation?  
(1) Filing a case in the court in the interest of the public  
(2) Procedure of removal of President  
(3) Reviewing Judgement  
(4) All of the above
- 100.** Consider the following statements on parties :  
A. Political parties do not enjoy much trust among the people.  
B. Parties are often rocked by scandals involving top party leaders.  
C. Parties are not necessary to run governments.  
Which of the statements given above are correct?  
(1) A, B, and C                      (2) A and B  
(3) B and C                      (4) A and C

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SPACE FOR ROUGH WORK