STATE LEVEL NATIONAL TALENT SEARCH EXAMINATION, 2019
MENTAL ABILITY AND SCHOLASTIC APTITUDE TEST
For Class X

Part – I
MENTAL ABILITY TEST

Questions 1 – 5: In the following letter series what will come in the place of question mark (?)

1. Z, X, V, T, R, ?, ?
   (1) O, K (2) N, M (3) K, S (4) P, N

2. Nd, iy, dt, yo, tj, ?
   (1) mp (2) nq (3) of (4) oe

3. BDF, CFL, DHL, ?
   (1) CJM (2) EIM (3) EJO (4) EMI

4. YEB, WFD, UHG, SKI, ?
   (1) QOL (2) QGL (3) TOL (4) QNL

5. ABD, DGK, HMS, MTB, SBL, ?
   (1) ZKW (2) ZKU (3) ZAB (4) XKW

Questions 6 – 7: Choose from the following options which will continue the series given below :

6. P 3 C, R 5 F, T 8 I, V 12 l, ?
   (1) Y 17 O (2) X 17 M (3) X 17 O (4) X 16 O

7. D – 4, F – 6, H – 8, J – 10,?, ?
   (1) K – 12, M – 13 (2) L – 12, M -14 (3) L – 12, N – 14 (4) K – 12, M – 14

Questions 8 – 12: In these question pair of words to the left of : : have certain relationship with each other. Select the correct alternative so that similar relationship is established to the right of : :

8. Newspaper : Press :: Cloth : ?
   (1) Tailor (2) Fibre (3) Factory (4) Mill

9. Mumbai : Maharashtra :: Trivandrum : ?
   (1) Kolkata (2) Gujarat (3) Rajasthan (4) Kerala

10. Eye : Myopia :: Teeth : ?
    (1) Pyria (2) Cataract (3) Eczema (4) Trachoma

11. Doctor : Nurse : : ? : Follower
    (1) Employer (2) Leader (3) Worker (4) Manager

12. Cattle : Herd :: Sheep : ?
    (1) Flock (2) Swarm (3) Crowd (4) Shoal

Questions 13 – 17: In each of the following questions the first two words (given in italics) have a definite relationship. Choose one word out of the given four alternatives which will fill in the blank space and show the same relationship with the third word as between the first two.

13. Tempest is to Storm as Slim is to
    (1) Fat (2) Plump (3) Slender (4) Beautiful

14. Water is to Oxvsen as Salt is to_____
(1) Iron (2) Sodium (3) Calcium (4) Protein

15. Trumpet is to Band as Knife is to_____
(1) Fork (2) Metal (3) Cutlery (4) Cut

16. *Kilometre is to Distance as Poundal is to*
(1) Velocity (2) Momentum (3) Force (4) Atlas

17. *Liquid is to Fluidity as Comedian is to*_____
(1) Energy (2) Awareness (3) Uniformity (4) Humour

Questions 18 – 22: In the following question complete the given number series with the most suitable alternative in place of question mark (?)

18. 7, 12, 19, ?, 39
(1) 29 (2) 28 (3) 26 (4) 24

19. 0, 6, 24, 60, 120, 210, ?
(1) 240 (2) 290 (3) 336 (4) 504

20. 4, 6, 12, 14, 28, 30, ?
(1) 32 (2) 60 (3) 62 (4) 64

21. 1, 3, 3, 6, 7, 9, ?, 12, 21
(1) 10 (2) 11 (3) 12 (4) 13

22. In the given series 357, 363, 369,……..what will be the 10^{th} term?
(1) 405 (2) 411 (3) 413 (4) 417

Question 23 – 27: Certain rules are followed in the given series of alphabets where some alphabets are missing. Find out the missing alphabet series from the given four alternatives and mark it on your Answer Sheet

23. A_bbc_aab_cca_bbcc
(1) bacb (2) acba (3) abba (4) caba

24. Ab_aa_bb_aaa_bbba
(1) abba (2) baab (3) aaab (4) abab

25. be_b_c_b_ccb
(1) cbcb (2) bbcb (3) ebbe (4) bcbc

26. abb_baa_a_bab_aba
(1) abba (2) abab (3) ccac (4) aabb

27. abca_bcaab_ca_bbc_a
(1) ccaa (2) bbaa (3) abac (4) abba

Questions 28 – 30: The following questions are based on position number of letters in alphabetic order. Find out the correct answer from the given alternatives and mark it on your answer-sheet as directed.

28. If PAINT is coded as 74128 and EXCEL is coded as 93596, then how would you encode ACCEPT ?
(1) 455978 (2) 547978 (3) 554978 (4) 735961

29. In a certain code, SIKKIM is written as THLJJL. How is TRAINING written in that code?
(1) SQBHOHOH (2) JQBH0H0F (3) UQBJOHHO (4) UQBJOHOH

30. If in a certain language. GAMBLE is coded as FBLCKF, how is FLOWER coded in that code?
(1) GKPVFQ (2) EMNXDS (3) GMPVDS (4) HNQYGT

Questions 31 – 33: In substitution coding some particular objects are assigned as code names and the question is asked that is to be answered in the code language.

31. If 'Cook' is called 'Butler', 'Butler' is called 'Manager', 'Manager' is called 'Teacher', 'Teacher' is called 'Clerk' and 'Clerk' is called 'Principal', who will teach in a class?
(1) Cook (2) Butler (3) Clerk (4) Teacher

32. If 'Diamond' is called 'Gold', 'Gold' is called 'Silver', 'Silver' is called 'Ruby' and 'Ruby' is called 'Emerald', which is the cheapest jewel ?
(1) Diamond (2) Silver (3) Gold (4) Ruby

33. If 'Eye' is called 'Hand', 'Hand' is called 'Mouth', 'Mouth' is called 'Ear', 'Ear' is called 'Nose' and 'Nose' is called 'Tongue', with which of the following would a person hear ?
(1) Eye (2) Mouth (3) Nose (4) Ear

Questions 34 – 38: In this type of questions, a round about description is given in the form of certain small relationships and direct relationship between the persons concerned is to be deciphered and choose correct answer.

34. Pointing to a man on the stage, Rita said, "He is the brother of the daughter of the wife of my husband". How is the man on the stage related to Rita ?
(1) Son (2) Husband (3) Cousin (4) Nephew

35. Showing the man receiving the prize. Saroj said, He is the brother of my uncle's daughter." How is the man related to Saroj ?
(1) Son (2) Brother–in-Law (3) Cousin (4) Uncle

36. Pointing to a man, a woman said. "His mother is the only daughter of my mother." How is the woman related to the man ?
(1) Mother (2) Daughter (3) Sister (4) Grandmother

37. If Kamal says, "Ravi's mother is the only daughter of my mother how is Kamal related to Ravi ?
(1) Grandfather (2) Father (3) Brother (4) None of these

38. Rahul told Anand, "Yesterday I defeated the only brother of the daughter of my grandmother." Whom did Rahul defeat ?
(1) Son (2) Father (3) Brother (4) None of these

Questions 39 - 43: Read the following information and answer the questions based on it:
In a school, there were five teachers. A and B were teaching Hindi and English. C and B were teaching English and Geography. D and A were teaching Mathematics and Hindi. E and B were teaching History and French.

39. Who among the teachers were teaching maximum number of subject?
(1) A (2) B (3) C (4) D

40. Which of the following pairs was teaching both Geography and Hindi ?
(1) A and B (2) B and C (3) D and B (4) None of these

41. Which subject was taught by more than two teachers ?
(1) History (2) Hindi (3) French (4) Geography

42. D, B and A were teaching which of the following subjects ?
(1) English only (2) Hindi and English
(3) Hindi only (4) English and Geography

43. Who among the teachers was teaching less than two subjects ?
(1) A (2) B (3) D (4) There is no such teacher

Questions 44 – 48: Each of the following questions consists of two words that have a certain relationship with each other, followed by four pairs of words. Select the correct pair which has the same relationship as the original pair of words .

44. Light: Darkness
(1) Anger : Friendship (2) Education : Illiteracy
(3) Sanity : Madness (4) Medicine : Patient

45. Bear : Hibernation
(1) Man : Immigration (2) Bird : Migration
(3) Food : Adulteration (4) Frog : Aestivation

46. Doctor : Hospital
(1) Plumber : Wrench (2) Chef: Kitchen
(3) Water : Reservoir (4) Farmer : Village

47. Bird : Cage
(1) Animals : Zoo (2) Thief: Prison
(3) Antique : Museum (4) Crime : Punishment

48. Geology : Earth
(1) Architect: Building (2) Biology : Science
(3) Aquarium : Fish (4) Archaeology : Artifacts

Questions 49 – 52: A successive follow up of directions is formulated and the candidate is required to ascertain the final direction or the distance between two points.

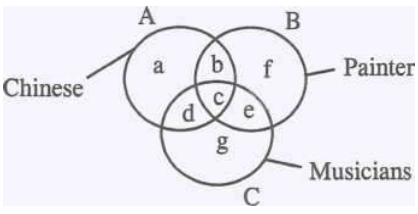
49. A man is facing south. He turns 135° in the anticlockwise direction and then 180° in the clockwise direction. Which direction is he facing now ?
(1) North-East (2) North-West (3) South-East (4) South – West

50. A man is facing north-west. He turns 90° in the clockwise direction and then 135° in the anticlockwise direction. Which direction is he facing now ?
(A) East (2) West (3) North (4) South

51. Gaurav walks 20 metres towards North. He then turns left and walks 40 metres. He again turns left and walks 20 metres. Further, he moves 20 metres after turning to the right. How far is he from his original position ?
(1) 20 metres (2) 30 metres (3) 50 metres (4) 60 metres

52. Ankit walks 10 metres in front and 10 metres to the right. Then every time turning to his left, he walks 5, 15 and 15 metres respectively. How far is he now from his starting point ?
(A) 5 metres (2) 10 metres (3) 15 metres (4) 20 metres

Questions 52 – 53: In the figure given below there are there intersecting circles each representing certain section of people. Different regions are marked a to g. Read the statements in each of the following questions and choose the letter of the region which correctly represents the statement.



53. Chinese who are painters but not musicians
(1) b (2) c (3) d (4) g

54. Painters who are neither Chinese nor musicians –
(1) b (2) c (3) f (4) g

55. Chinese who are musicians but not painters_
(1) d (2) c (3) b (4) a

56. Chinese who are painters as well as musicians_____
(1) a (b) b (3) c (4) d

Questions 57 – 59: In the diagram, the triangle stands for graduates, square stands for membership of professional organisations and the circle stands for membership of social organisations. Read each statement and find out the appropriate number(s) to represent the people covered by the given statement.

57. Number of graduates in social organisations_____
(1) 1 (2) 5 (3) 6 (4) 5 and 6

58. Number of graduates in social Organisations only_____
(1) 3 (2) 4 (3) 5 (4) 6

59. Number of graduates in professional Organisations_____
(1) 5 and 7 (2) 5, 6 and 7 (3) 6 and 7 (4) 4, 5 and 6

Questions 60 – 62: Arrange the given words in alphabetical order and choose the one that comes first.

60. (1) Wasp (2) Waste (3) War (4) Wrinkle

61. (1) Science (2) Scrutiny (3) Scripture (4) Scramble

62. (1) Nature (2) Native (3) Narrate (4) Nascent

Questions 63 – 64: In each of the following questions, arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence.

63. 1. Preach 2. Praise 3. Precinct 4. Precept 5. Precede
(1) 2,1,5,4,3 (2) 2,1,3,4,5 (3) 2,5,1,4,3 (4) 1,2,5,4,3

64. 1. Select 2. Seldom 3. Send 4. Selfish 5. Seller
(1) 1,2,4,5,3 (2) 2,1,5,4,3 (3) 2,1,4,5,3 (4) 2,5,4,1,3

Questions 65 – 66: In each of the following questions, choose one word which cannot be formed from the letters of the given word.

65. HIGHLIGHTS
(1) HIGH (2) LIGHT (3) HEAT (4) HITS

66. DESTRUCTION
(1) CURE (2) START (3) ROUTE (4) NEST

Questions 67 – 69: Study the following number sequence and answer the questions given below it:
5 14739857263 15863852243496

67. How many odd numbers are there in the sequence which are immediately followed by an odd number ?
(1) 1 (2) 2 (3) 3 (4) More than 3

68. How many even numbers are there in the sequence which are immediately preceded by an odd number but immediately followed by an even number ?
(1) 1 (2) 2 (3) 3 (4) 4

69. How many odd numbers are there in the sequence which are immediately preceded and also immediately followed by an even number ?
(1) 1 (2) 2 (3) (4) 4

70. How many numbers from 11 to 50 are there which are exactly divisible by 7 but not by 3?
(1) Two (2) Four (3) Five (4) Six

71. A number is greater than 3 but less than 8. Also it is greater than 6 but less than 10. The number is
(1) 5 (2) 6 (3) 7 (4) 8

72. In a row of 21 girls, when Monika was shifted by four places towards the right, she became 12^{th} from the left end. What was her earlier position from the right end of the row ?
(1) 9^{th} (2) 10^{th} (3) 11^{th} (4) 14^{th}

73. In a row of trees, one tree is fifth from either end of the row. How many trees are there in the row?
(1) 8 (2) 9 (3) 10 (4) 11

74. 1.12.91 is the first Sunday. Which is the fourth Tuesday of December 1991 ?
(1) 17.12.91 (2) 24.12.91 (3) 26.12.91 (4) 31.12.91

75. If the day before yesterday was Thursday, when will Sunday be?
(1) Today (2) Two days after today
(3) Tomorrow (4) Day after tomorrow

Questions 76 – 80: In the given below question substitutes for various mathematical symbols, followed by a question involving calculation of an expression is given. put the real signs in the given equations and solve the questions-

76. If 'x' means '$-$','$-$' means 'x', '$+$' means '$\div$' and '$\div$' means '$+$' ,then
$13-12\div 400+20\times 100=?$
(1) 1/1760 (2) 76 (3) 176 (4) 186

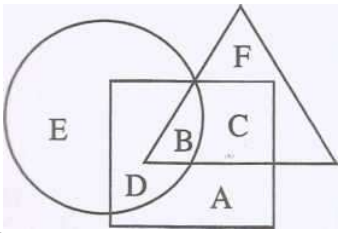
77. If '$+$' means 'x','x' means '$+$' '-'means'$\div$' and '$\div$' means '$-$', then
$16\times 2\div 4+7\times 8=?$
(1) 31 (2) 43/2 (3) 29/2 (4) 15

78. If'$+$' means '$\div$','$\div$' means '-' '-'means'x' and 'x' means '$+$', then
$64\times 8\div 6-4\times 2=?$
(1) -14 (2) 34 (3) 24 (4) 16

79. If'$+$' means '-','$-$' means 'x' 'x'means'$\div$' and '$\div$' means '$+$', then
$48\times 4\div 7+8-2=?$
(1) 3 (2) -3 (3) 26 (4) 35

80. If'$+$' means '$\div$','$\div$' means '-' '-'means'x' and 'x' means '$+$', then
$12+2\times 9\div 4=?$
(1) 9 (2) 11 (3) 4 (4) 15

Questions 81- 85: In the following diagram three classes of population are represented by three figures. The triangle represents the school teachers, the square represents the married persons and the circle represents the persons living in joint families.



81. Married persons living in joint families but not working as school teachers are represented by.
(1) C (2) F (3) D (4) A

82. Persons who live in joint families, are unmarried and who do not work as school teachers are represented by
(1) C (2) B (3) E (4) D

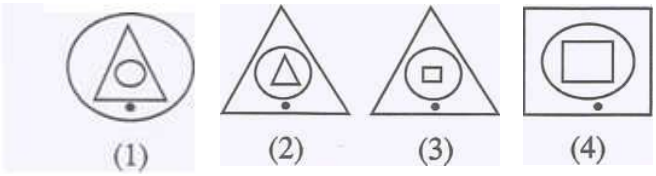
83. Married teachers living in joint families are represented by
(1) C (2) B (3) D (4) A

84. School teachers who are married but do not live in joint families are represented by
(1) C (2) F (3) A (4) D

85. School teachers who are neither married nor do live in joint families are represented by
(1) F (2) C (3) B (4) A

Questions 86 – 90: In each of the following sets of figures, select the one figure that is different from the other figures from the given options.

86.



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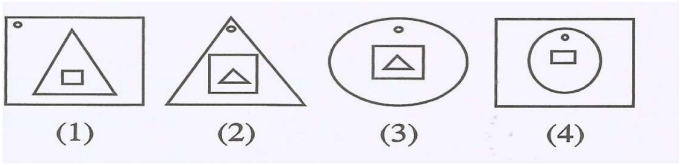

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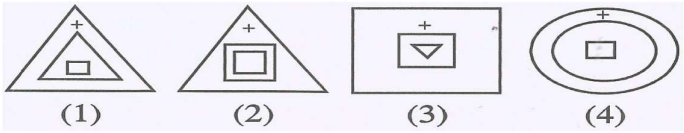

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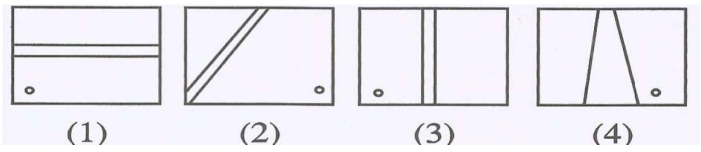

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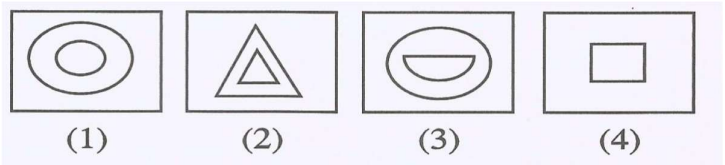
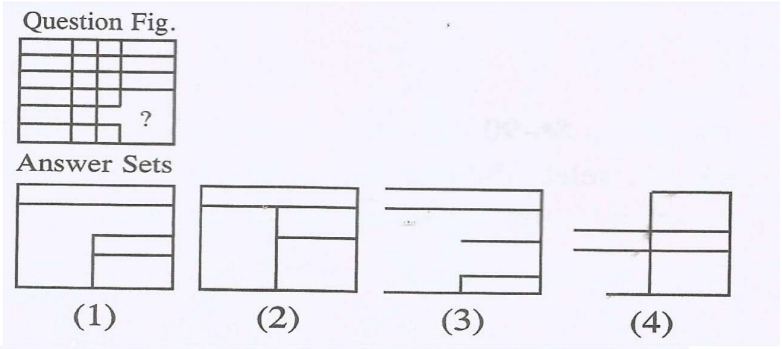


Questions 91 – 95: Select the figure from the answer choices that fits in the question figure to complete its original design/ pattern.

91.



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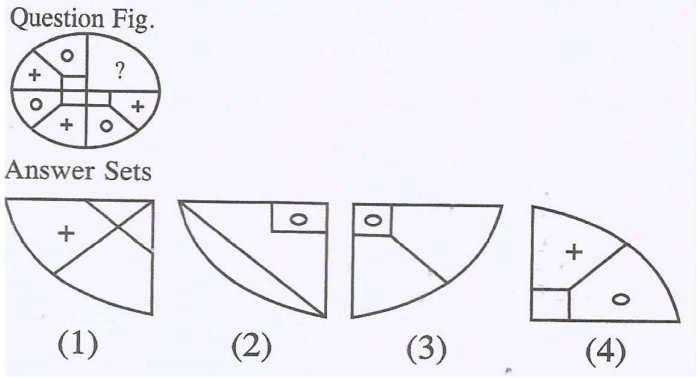

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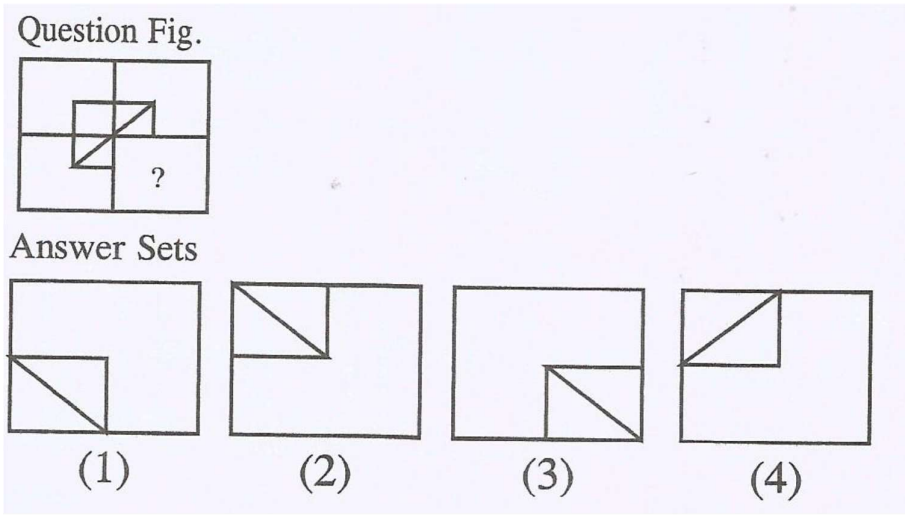

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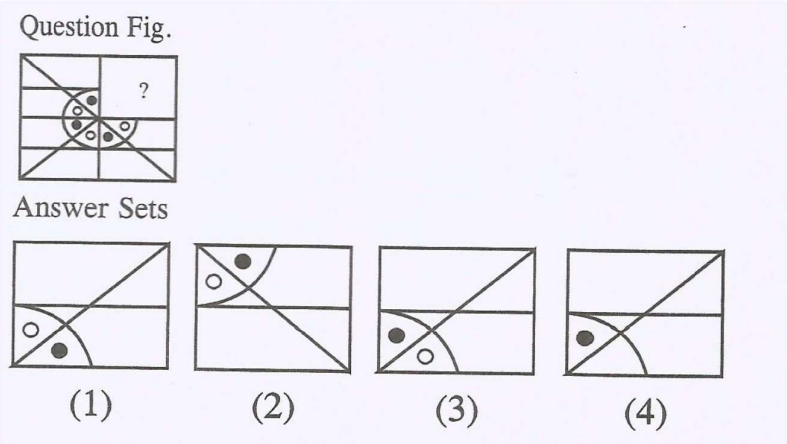

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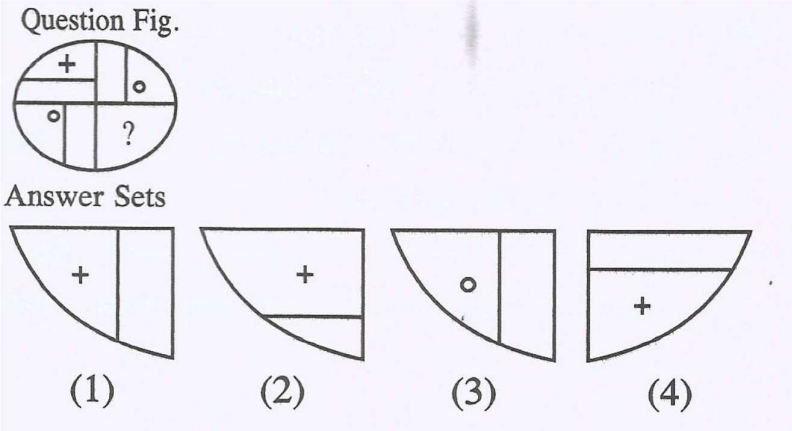


96. In a Post-Office, stamps of three different denominations Rs. 7, Rs. 8, Rs. 10 are available. The exact amount for which one cannot buy stamps is
(1) 19 (2) 20 (3) 23 (4) 29

97. A person, decided to go to a weekend trip and decided not to exceed 8 hours driving in a day. Average speed of forward journey is 40 m/h. Due to traffic in Sundays; the return journey average speed is 30 m/h. How far he can select a picnic spot ?
(1) 120 miles (2) 130 miles (3) 150 miles (4) 145 miles

98. A batsman in his 18th innings makes a score of 150 runs and thereby increasing his average by 6. Find his average after 18th innings.
(1) 52 (2) 42 (3) 60 (4) 45

99. In a cricket season, India defeated Australia twice, West Indies defeated India twice, Australia defeated West Indies twice, India defeated New Zealand twice and West Indies defeated New Zealand twice. Which country has lost most number of times.
(1) India (2) Australia (3) New Zealand (4) West Indies

100. If rains is called pink, pink is called cloud, cloud is called water, water is called breeze and breeze is called moon, what do you wash your hands with ?
(1) water (2) rain (3) breeze (4) moon

PART-II
SCHOLASTIC APTITUDE TEST II
(b) OTHER SUBJECTS

(A) SCIENCE DISCIPLINE

Physics

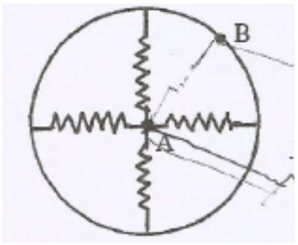
1. A bar magnet of magnetic moment M is bent to form a semicircle. What is the magnetic moment of the bent magnet ?
(1) $\frac{M}{\pi}$ (2) $\frac{2M}{\pi}$ (3) $\frac{M\pi}{2}$ (4) M

2. The SI unit of self-induction is :
(1) henry (2) $\frac{weber}{ampere}$ (3) $\frac{volt \times \sec}{ampere}$ (4) all of the above

3. Critical angle for total internal reflection will be smallest for light travelling from :
(1) Water to Glass (2) Glass to Water (3) Glass of Air (4) Water to Air

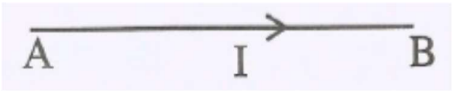
4. A lens behaves as a coverging lens in air and a diverging lens in water. The refractive index of lens is :
(1) 1 (2) 1.33
(3) between unity and 1.33 (4) Greater than 1.33

5. What is the equivalent resistance of the network between points A and B ? (each resistance is of value r).



(1) $\frac{r}{2}$ (2) 4r (3) $\frac{r}{4}$ (4) zero

6. Current from A to B in the straight wire is decreasing. The direction of induced current in circular loop will be :



(1) clock wise (2) anticlockwise
(3) no induced current flows (4) seebeck effect

7. Dynamo works on the principle of :
(1) Heating effect of current (2) Electromagnetic induction
(3) Chemical effect of current (4) Seebeck effect

8. Lorentz force is given by : (symbols have their usual meanings)
(1) $\vec{F} = q\left(\vec{E} + \vec{V} \times \vec{B}\right)$ (2) $\vec{F} = q\left(\vec{B} + \vec{V} \times \vec{E}\right)$
(3) $\vec{F} = q\left(\vec{E} - \vec{V} \times \vec{B}\right)$ (4) $\vec{F} = q\left(\vec{E} - \vec{V} \times \vec{B}\right)$

9. The radius of the path of a charged particle in a uniform magnetic field is directly proportional to :
(1) Charge of the particle (2) Momentum of the particle
(3) Energy of the particle (4) Intensity of field

10. A short sighted person uses a spectacle of power -0.4 D to see very distant objects. How far can he see without using spectacle ?
(1) 40m (2) 100m (3) 2.5m (4) 10m

11. Determine the potential difference between ends of a wire of resistance 5Ω if 720C charge passes through it per minute.
(1) 10V (2) 20V (3) 30V (4) 60V

12. 15 cells each of emf 2 volt are connected in series but 2 of them are connected wrongly. Calculate the emf of the combination
(1) 30 volt (2) 26 volt (3) 22 volt (4) 28 volt

13. Copper is
(1) Paramagnetic (2) Diamagnetic (3) Ferromagnetic (4) None of these

Chemistry

14. Match the following :
List -I :

(a) Frequency of distribution of the emitted radiation from a black body.

(b) Spin quantum numbers(m_s)

(c) Angular Momentum

(d) All orbital have equal energy

List - II :

(i) degeneracy

(ii) temperature dependent

(iii) vector quantity

(iv) mass times velocity times radius

Codes :

	(a)	(b)	(c)	(d)
(1)	(iii)	(i)	(iv)	(ii)
(2)	(ii)	(iii)	(iv)	(i)
(3)	(iii)	(iv)	(ii)	(i)
(4)	(iv)	(iii)	(ii)	(i)

15. Maximum co-valency of phosphorous can be
(1) 4 (2) 5 (3) 6 (4) 3

16. Nucleic acid are called acids mainly because of the presence of -
(1) -COOH group
(2) -OH group in the sugar unit
(3) -OH group of the heterocyclic base
(4) -OH group of the phosphate unit

17. 0.225g of an organic dibasic acid required 100ml of 0.05N NaOH solution to complete the neutralization. The molecular mass of the acid will be -
(1) 180 (2) 90 (3) 45 (4) 120

18. In a reaction the initial concentration of the reactants increase fourfold and rate becomes eight times its initial value. The order of reaction is -
(1) 2.0 (2) 1.0 (3) 2.5 (4) 1.5

19. Silver is extracted from Ag_2S by -
(1) fusing it with KCl and electrolyzing the melt
(2) reducing it with Zinc
(3) treating with sodium cyanide followed by zinc
(4) roasting it and reducing the resultant product by smelting

20. $A1_4C_3$, Mg_2C_3 and CaC_2 are separately treated with water. The organic products formed respectively, are -
(1) methane, ethane and acetylene
(2) methane, methylacetylene and acetylene
(3) methylacetylene, methylacetylene and acetylene
(4) methane, methylacetylene and methane

21. Fog is a colloidal solution of-
(1) liquid particles dispersed in gas (2) gaseous particles dispersed in a liquid
(3) solid particles dispersed in a liquid (4) solid particles dispersed in a gas

22. What is the approximate characteristic voltage that develops across a red LED ?
(1) 3.4 V (2) 1.7 V (3) 0.9 V (4) 1.9 V

23. In which of the following pairs, the second compound is more polar than the first ?
(1) $(CH_3)CCl$ and CH_4 (2) $CHCl_3$ and CCl_3F
(3) CH_3NH_2 and CH_3NO_2 (4) CH_3OH and CH_3NH_2

24. The alloy nichrome contains
(1) Ni, Cr, Fe and Mn (2) Cr, Ni, Cu and Zn
(3) Ni, Cr, Fe and Zn (4) Ni, Cr, Fe and C

25. Which of the following pairs have layer lattice structure in solid state chemistry -
(1) $SrCl_2$ and Cdl_2 (2) diamond and graphite
(3) graphite and Cdl_2 (4) $MgSO_4.7H_2O$ and $FeSO_4.7H_2O$

26. In the reaction $CH_3CH_2COCl \xrightarrow[H_2]{Pb/BaSO_4} X$ the X is
(1) propionaldehyde (2) acetaldehyde
(3) acetic acid (4) acetone

Biology

27. Each of the following molecule is a polymer except
(1) protein (2) cellulose (3) glucose (4) glycogen

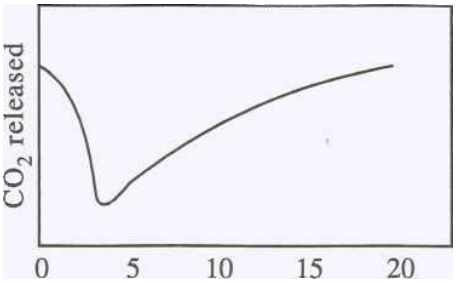
28. In a population of 500 rats, there were 55 births and 05 (five) deaths during one year period. What is the reproductive rate of the population during one year period.
(1) 0.01/yr (2) 0.05/yr (3) 0.1/yr (4) 5.5/yr

29. Movement of molecules during diffusion can be described all of the following except -
(1) Each molecule moves randomly.
(2) Solute molecules always moves down the concentration gradient
(3) Each molecule moves independently of other molecule
(4) Net movement of solute molecules ᵘ is from region of higher to region of lower concentration

30. Plasma membrane consists mainly of :
(1) Protein embedded in carbohydrate
(2) Phospholipids embedded in protein bilayer
(3) Protein embedded in phospholipid bilayer
(4) Protein embedded with polymer of glucose

31. Which one of the following expresses the concept of allele in a lucid way.
(1) Genes for wrinkled and yellow seeds.
(2) Genes for wrinkled and round seeds.
(3) Dominant expression of wrinkled genes.
(4) all of the above

32.



Above graph show's amount of CO_2 produced by plant cells at various levels at atmospheric O_2

In respiration at atmospheric oxygen below 1 **%** level the amount of CO^ released is relatively high. This is due to
(1) TCA cycle is hyper active.
(2) There is insufficient amount of CO-enzyme A
(3) Alcoholic fermentation is occurring
(4) Pyruvic acid oxidation is incomplete.

33. All of the following statements about the process of cell divisions are true except one, mark it.
(1) Spindle fibres are made of microtubules.
(2) All eukaryotic cells possess centriole.
(3) Many of the microtubules are attached to the centromere of the chromosomes.
(4) Centriole consists of nine triplets of microtubules arranged in a circle.

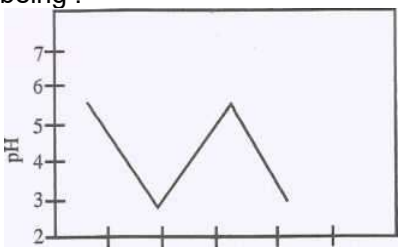
34. During the process of respiration, all of the following processes release CO_2 except -
(1) Conversation of pyruvate to ethanol.
(2) Oxidative Phosphorylation.
(3) Tricarboxylic acid cycle.
(4) Conversion of pyruvic acid to Acetyl CoA

35. In typical cell divisions by mitosis and meiosis, all of the following contributes to genetic variation except :
(1) Anaphase of meiosis
(2) Random fusion of egg and sperm
(3) Crossing over (exchange of Genes)
(4) Anaphase of mitosis

36. One of the following statements is true about photosynthetic pigments in plants
(1) There is only one type of chlorophyll.
(2) Chlorophyll absorbs only green light during photosynthesis.
(3) Chlorophyll is found in the membrane of Thylakoids.
(4) Chlorophyll is needed for Calvin cycle

37. When the concentration of solutes differs on the two sides of a membrane permeable only to water, then -
(1) Water will move across the membrane by active transport.
(2) Water will move across by the process of Osmosis.
(3) Water will move across through plasmolysis.
(4) Water will move across by diffusion

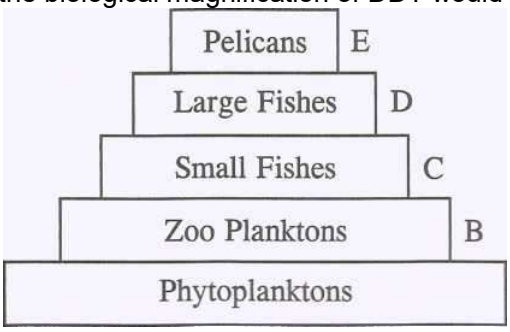
38. Graph represents the measurement of pH in plant leaves during 36 hrs. of photosynthetic activity. It indicates that acid products were being :



(1) Produced at night
(2) Produced during the day.
(3) Produced at night and degraded during the day.
(4) Produced during degraded at night

39. Figure shows pyramid of biomass at different trophic levels.

At which trophic level, would the biological magnification of DDT would be highest.



(1) at A & C (2) at A only (3) at A & B (4) at E only

40. When deciduous trees drops their leaves during fall, the colour of leaves turn to various shades of red, orange and yellow due to the presence of :
(1) Chlorophyll A & B (2) Presence of Fungal growth
(3) presence of carotenoids (4) insufficient ATP

(B) Mathematics

41. A positive integer n when divided by 9, gives 7 as remainder. What will be the remainder when (3n-l) is divided by 9 ?
(1) 1 (2) 2 (3) 3 (4) 4

42. If the zeros of the polynomial $x^3 - 3x^2 + x + 1$ are (a – d), a and (a + d) then (a + d) is
(1) a rational number (2) an integer
(3) a natural number (4) irrational number

43. If the product of the roots of the equation $x^2 - 2\sqrt{2}Kx + 2e^{2\log k} - 1 = 0$ is 31, then the roots of the equation are real for K equal to
(1) 4 (2) 3 (3) 2 (4) 1

44. The solution of $\log\frac{x}{\sqrt{3}} + \log\frac{x}{\sqrt[4]{3}} + \log\frac{x}{\sqrt[6]{3}} + ... + \log\frac{x}{\sqrt[16]{3}} = 36$, find x
(1) x = 3 (2) $x = \sqrt{3}$ (3) $x = 4\sqrt{3}$ (4) x = 9

45. A certain number of tennis balls were purchased for Rs. 450. Five more balls could have been purchased for the same amount if each ball was cheap by Rs. 15. The number of balls purchased is …….
(1) 15 (2) 20 (3) 25 (4) 10

46. If $Sn = nP + \frac{n}{2}(n-1)Q$, where Sn denotes the sum of the first n terms of an Arithmetic progression (AP), then the common difference is
(1) P + Q (2) 2P + 3Q (3) 2Q (4) Q

47. The value of $\sin\frac{\pi}{14}\sin\frac{3\pi}{14}\sin\frac{5\pi}{14}\sin\frac{7\pi}{14}\sin\frac{9\pi}{14}\sin\frac{11\pi}{14}\sin\frac{13\pi}{14}$ is
(1) $\frac{1}{16}$ (2) $\frac{1}{64}$ (3) $\frac{1}{128}$ (4) none of these

48. If a flagstaff of 6 metres high placed on the top of a tower throws a shadow of $2\sqrt{3}$ metres along the ground then the angle (in degrees) that the sun makes with the ground is :
(1) 60° (2) 30° (3) 45° (4) none of these

49. Which one of the following decimal expansion is not terminating ?
(1) $\frac{3}{8}$ (2) $\frac{6}{15}$ (3) $\frac{17}{512}$ (4) $\frac{29}{343}$

50. If $\cos\theta + \cos^2\theta = 1$ then $\sin^4\theta + \sin^2\theta = ...$
(1) 0 (2) 1 (3) $\frac{1}{2}$ (4) none of these

51. A and B are fixed points. The vertex C of ΔABC moves such that cot A + cot B = constant. The locus of C is
(1) A straight line perpendicular to AB (2) straight line parallel to AB
(3) Inclined at an angle (A-B) to AB (4) None of these

52. The distance of the point (3, 5) from the line 2x + 3y – 14 = 0 measured parallel to the line x – 2y = 1 is
(1) $7/\sqrt{5}$ (2) $7/\sqrt{13}$ (3) $\sqrt{5}$ (4) $\sqrt{13}$

53. Three horses are tethered with 7 metre long ropes at the three corners at a triangle field having sides 20m, 34m and 42m. The area of the plot which can be grazed by horses is :
(1) $50m^2$ (2) $77m^2$ (3) $82m^2$ (4) $90m^2$

54. The mean of 25 observations is 36. If the mean of the first 13 observations is 32 and that of the last 13 observations is 39 then the 13^{th} observation is
(1) 32 (2) 30 (3) 28 (4) 23

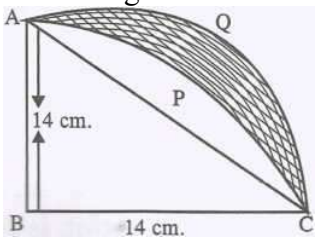
55. A right circular cone is 8.4 cm high and the radius of its base is 2.1 cm. The cone is melted and recast into a sphere. Find the radius of the sphere.
(1) 2.1 cm (2) 4.2 cm (3) 5.3 cm (4) 6.4 cm

56. The average weight of pupils of a class is 46 kg. The average weights of boys and girls are respectively 50 kg and 40 kg. The ratio of the number of boys to the number of girls is
(1) 2 : 3 (2) 3 : 2 (3) 2 : 5 (4) 5 : 2

57. The internal and external diameters of a hollow hemispherical vessel are 24 cm and 25 cm respectively. If the cost for painting 1 cm' of the surface area is Rs. 0.05 then the total cost of painting the vessel all over is :
(1) Rs 90.05 (2) Rs 96.28 (3) Rs 95.20 (4) Rs 96.29

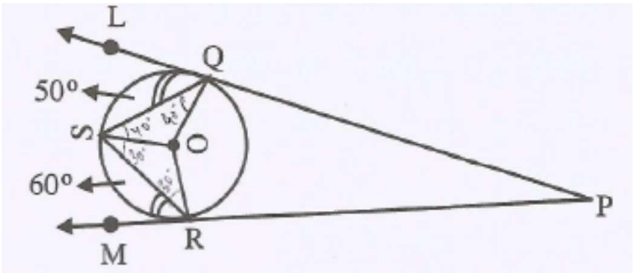
58. If each edge of a cube is increased by 50% then the percentage increase in its surface area is :
(1) 50% (2) 125% (3) 130% (4) 140%

59. In the adjoining figure ABCPA is a quadrant of a circle of radius 14 cm. With AC as diameter, a semicircle is drawn. The area of the shaded region is :



(1) $35\ cm^2$ (2) $64\ cm^2$ (3) $98\ cm^2$ (4) $132\ cm^2$

60. In the adjoining figure, O is the centre of a circle; PQL and PRM are the tangents at the points Q and R respectively and S is a point on the circle such that ZSQL = 50° and ZSRM = 60° then the value of ZQSR is :



(1) 40^o (2) 50^o (3) 60^o (4) 70^o

(C) SOCIAL STUDIES AND HUMANITIES

History

61. Who of the following founded young Italy?
(1) Mazzini (2) Garibaldi (3) Cavour (4) None of these

62. Napoleon Bonaparte is credited to awaken one of these for obtaining unity-
(1) Austria (2) Russia (3) Serbia (4) Italy

63. Vladimir Ilyich Ulyanov was the full name of –
(1) Leon Trotsky (2) Nikolai Lenin (3) Joseph Stalin (4) Nicholas II

64. Who of the following rulers reigned Russia during 1894 to 1917?
(1) Nicholos I (2) Nicholos II (3) Catherine (4) Alexander I

65. One of the following was not associated with the name of Lenin-
(1) He brought about radical changes in education
(2) He gave high honour to church
(3) He introduced New Economic Policy with the help of Capitalists.
(4) he attacked slavery

66. The political idea that is based on the belief that all people are equal and that money and property should be equally divided is known as
(1) Communism (2) Socialism (3) Post Modernism (4) Oligarchism

67. The First French Governor General of Indo-China who administered it between 1897-1902 was-
(1) Paul Doumer (2) Albert Sarraut
(3) Louis De Freycinet (4) Ngo Dinh Diem

68. Against which of the following, Great Britain and France declared War on 3rd Sept. 1939?
(1) Japan (2) Italy (3) Germany (4) Russia

69. In January 1942 japan defeated…… army and captured Philippines island.
(1) American (2) French (3) English (4) All the three

70. Which of these statement is incorrect?
(1) The system of Secret Alliances developed after the Franco Prussian War of 1870.
(2) The First World War was not the product of rising nationalist sentiment.
(3) Italy was throughout with Germany in the First World War.
(4) USA supported England and France in the First World War.

71. The Khilafat Movement started in 1919 was against the British Government maltreatment towards-
(1) Turkey (2) Iran (3) Iraq (4) Saudi Arabia

72. One of these is not a labour leader.
(1) S.A Dange (2) Gopen Chakraborti
(3) Sohan Singh Josh (4) Kshitindra Mohan Sen

Geography

73. Which of the following have been recognised on World Network of Biosphere Reserves by UNESCO?
(I) Sunderbans (II) Niligiri
(III) Kanchanzanga (IV) Gulf of Mannar
(1) I, II and III (2) II, III and IV (3) I, III and IV (4) I, II, III and IV

74. Which of the following is/are correct about shifting cultivation?
(I) It is also called 'Jhoom' in Assam. (II) It is a 'Slash and burn' agriculture.
(III) It involves crop rotation. (IV) It involves transhumance.
(1) I, II, III and IV (2) II, III and IV (3) I and II only (4) II and III only

75. Which of the following ports are located on the eastern coast of India?
(1) Cochin, Goa, Mumbai (2) Mumbai, Kolkata, Chennai
(3) Paradeep, Kakinada, Nagapattinam (4) Machilipatnam, Kandla, Aleppey

76. The Indian Meteorological Department declares a day as rainy day after having how much of rainfall on such day?
(1) 0.50 mm to 1.00 mm in 24 hours (2) 1.10 mm to 1.50 mm in 24 hours
(3) 1.60 mm to 2.00 mm in 24 hours (4) Above 2.5 mm in 24 hours

77. Which of the following are the tributaries of Brahmaputra river?
(I) Dibang (II) Kameng (III) Lohit
(1) I and II (2) II and III (3) I and III (4) I, II and III

78. Nanda Devi Bioshpere is situated in the state of
(1) Nagaland (2) Arunachal Pradesh
(3) Uttarakhand (4) Tripura

79. Which of the following is not correct about the cultivation of coffee in India?
(I) It is cultivated in the tropical highlands.
(II) It grows well on the laterite soils of Karnataka and Tamil Nadu.
(III) It stands first as a popular beverage in India.
(IV) Coffee Cultivation are generally done on less than 10 hectares land area.
(1) I and II (2) III and IV (3) only II (4) only III

80. Which of the following states of India have tropical moist evergreen forest?
(I) Arunachal Pradesh (II) Himachal Pradesh
(III) Mizoram
(1) I and II (2) II and III (3) I and III (4) None of these

81. Identify Kharif crops by using the codes of the following crops.
(I) Cotton (II) Groundnut (III) Maize (IV) Mustard
(1) I and II (2) I, II and III (3) III and IV (4) All of the above

82. If the local time at Patna, located at 85° E longiture is 10:00 hour then what will be the local time at Chennai located at 85° E longitude and Jodhpur located at 73° E Longitude?
(1) 09:12 hour, 09:40 hour (2) 09:40 hour, 09:12 hour
(3) 10:40 hour, 10:12 hour (4) 10:12 hour, 10:40 hour

83. Which of the following statements are true with regard to Coal in India?
(I) Coal is found in Sedimentary rocks. (II) The best quality of coal is lignite.
(III) Damodar river valley is popular known as “Ruhr of India”.
(1) I and II (2) II and III (3) I and III (4) I, II and III

84. Which state of India is famous for Jute Textile Industry?
(1) Tripura (2) Assam (3) Bihar (4) West Bengal

Civics

85. Non-sharing of powers in a democracy leads to:
(I) Peace among all the communities (II) The tyranny of the majority
(III) Oppression of minorities (IV) Political stability in the country
(1) I and II (2) II and III (3) I and IV (4) III and IV

86. Which of the following can only be removed by impeachment?
(I) The President (II) The Prime Minister
(III) The Speaker of the Lok Sabha (IV) the Vice-President
(1) I and II (2) II and III (3) III and IV (4) I and IV

87. Which of the following are 3rd tier of government in India?
(I) Community Government (II) State Government
(III) Panchayat Raj Government (IV) Urban Local Bodies
(1) I and IV (2) II and III (3) III and IV (4) I and II

88. Which of the following are the features of Federal Government?
(I) Two or multi levels of Government (II) Single Citizenship
(III) Independent Judiciary (IV) Fusion of Legislature and Executive
(1) I and II (2) I and III (3) II and IV (4) III and IV

89. Writs can be issued by:
(I) The Supreme Court (II) The High Courts
(III) The District Courts (IV) The Parliament
(1) I and II (2) II and III (3) I and IV (4) III and IV

90. Which of the following are fundamental rights?
(I) Right to Education (II) Right to Life (III) Right to Property (IV) Right to information
(1) I and II (2) III and IV (3) II and III (4) I and IV

91. Which type of party system exists in India?
(I) One-party system (II) Bi-Party system
(III) Multi party system (IV) Partyless system
(1) I and II (2) II and III (3) III and IV (4) only III

92. In a democracy, the term ‘Fourth Pillar’ is used for?
(I) The Parliament (II) The Executive (III) The Judiciary (IV) The Media
(1) I and II (2) III and IV (3) only IV (4) II and III

Economics

93. Which of the following statements are correct?
Statement I : Integration of market in different countries is known as foreign trade.
Statement II : Investment made by MNCs is called foreign investment.
Statement III : Rapid improvement information and communication technology has been one of the major factor that has stimulated globalization process.
Statement IV : All above statements are correct.
(1) Only I is correct (2) Only I and III are correct
(3) Statement IV is correct (4) Only II and III is correct

94. Which of the following activities can be included in the primary sector?
(1) Giving loans to the farmer (2) Making oil from sunflower
(3) Cultivating sunflower (4) Providing storage facility for the grains

95. Globalization was not stimulated by –
(I) Money (II) Transport (III) Population (IV) Computer
(1) Only I is correct (2) Only I and II are correct
(3) I, III and IV are correct (4) I, II, III and IV are correct

96. In the market place, consumers are exploited when –
(1) Shopkeepers weighs less than they should
(2) Traders add charges that were not mentioned before
(3) Adultered/Defective goods are sold
(4) All of the above

97. What does food security mean?
(1) Availability of food
(2) Accessibility of food
(3) Availability and accessibility of food to all at all the time
(4) Availability, accessibility and affordability of food to all at all the time

98. Which of the following types of activities are covered in the secondary sector?
(1) It generates services rather than goods
(2) natural products are changed through manufacturing
(3) Goods are produced by exploiting natural resources
(4) It includes agriculture, forestry and dairy

99. Which of the following organization looks after the credit needs of agriculture and rural development in India?
(1) FCI (2) IDBI (3) NABARD (4) ICAR

100. The minimum guaranteed price at which the government offer to purchase crops from farmers is known as –
(1) Procurement price (2) Minimum support price
(3) Issue Price (4) Market Price