



Test Booklet Code

0114

NATIONAL TEACHERS COUNCIL

**All India Talent Search Examination - 2014**

Class - X

Time Allowed: 2 Hours

Maximum Mark: 100

This Test Booklet contains 22 pages. Do not open the Test Booklet until you are asked to do so.

**Important instructions**

1. This question paper contains 100 multiple choice questions each of one mark.
2. The question paper is divided into two sections, **A** and **B**.
3. Section **A** is **Scholastic Aptitude Test (SAT)**, contains 60 questions. This section covers **Physics, Chemistry, Biology and Mathematics**.
4. Section **B** is **Mental Ability Test (MAT)**, **Computer Awareness** and **General Knowledge**, contains 40 questions.
5. There will be no negative marks for wrong answer.
6. A separate answer sheet is provided for answering the questions. Each question should be answered by **darkening** the appropriate circle (A, B, C, or D) with a **blue or black ball pen**.
7. Answer recorded once in the answer sheet cannot be altered.
8. All rough works should be done only in the space provided for **rough work** in this question paper.
9. Calculator is not permitted in the examination hall.
10. Candidate should write his / her name in the space provided for the purpose.

Roll Number : .....

Candidates Name : .....

Candidates Signature : .....

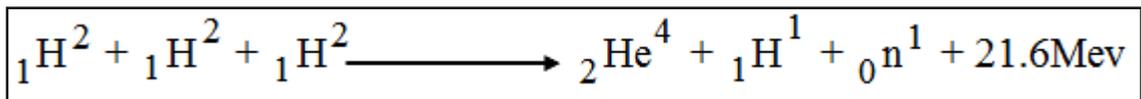
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Invigilator's Signature

**SECTION: A**

**PHYSICS (Q No: 1 to 15)**

1. Solar cells are joined together to form a  
 (A) Solar water heater      (B) Solar Concentrator  
 (C) Solar panel                (D) Solar cooker

2. Identify the type of reaction represented by the following equation.



- (A) Nuclear fusion              (B) Nuclear fission  
 (C) Chain reaction              (D) Chemical reaction
3. Match the following and select the correct option

Column A		Column B	
<b>P</b>	Moderator	<b>1</b>	Uranium
<b>Q</b>	Nuclear fuel	<b>2</b>	Graphite
<b>R</b>	Coolant	<b>3</b>	Cadmium
<b>S</b>	Control rod	<b>4</b>	Liquid sodium

	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>
<b>A</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
<b>B</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>4</b>
<b>C</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>3</b>
<b>D</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>4</b>

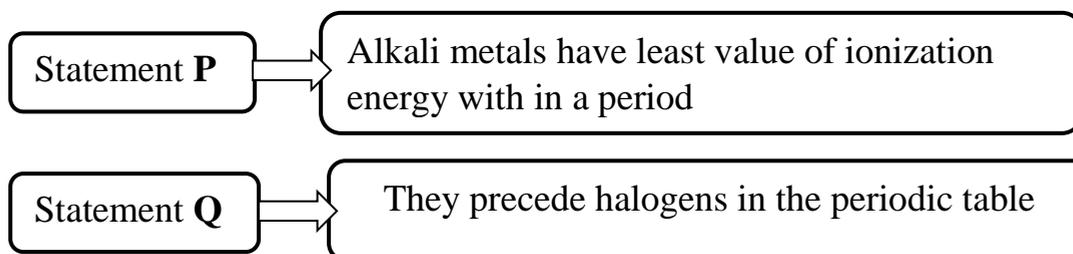
4. A device that converts alternating current to direct current  
(A) Transformer (B) Rectifier  
(C) Induction coil (D) Stabilizer
5. A red object, when seen through a thick blue glass appears  
(A) Red (B) Violet  
(C) Green (D) Black
6. A person is moving towards a plane mirror with a speed of  $1\text{ms}^{-1}$ . The image will approach the moving person with a relative speed of  
(A)  $0.5\text{ms}^{-1}$  (B)  $1\text{ms}^{-1}$   
(C)  $2\text{ms}^{-1}$  (D)  $4\text{ms}^{-1}$
7. We cannot see through fog because of  
(A) Reflection of light (B) Refraction of light  
(C) Internal reflection of light (D) Scattering of light
8. The electromagnetic radiations are in descending order  
(A) Infrared waves, Radio waves, X- rays, Visible light  
(B) Radio waves, Infrared waves, Visible light, X- rays  
(C) Radio waves, visible light, infrared waves, X-rays  
(D) X- rays, Visible light, Infrared waves, Radio Waves
9. A mirror forms an erect image half the size of an object, then  
(A) The mirror can be convex with object at  $2f$   
(B) The mirror can be convex with object lying at its focus  
(C) The mirror can be concave with object at  $2f$ .  
(D) The mirror can be concave with object within the focus
10. Vijaylakshmi got an electric shock when she touched the heating coil of an electric heater although the switch was in “**off**” position. The reason could be  
(A) The switch was connected to neutral wire.  
(B) The switch was connected to live wire.  
(C) The fuse of the home blown off  
(D) Excess current was flowing in the circuit.

11. Four statements are given below. Study the statements and select the correct option.
- (p) The product of a volt and a coulomb is a joule*  
*(q) The product of a volt and an ampere is a joule*  
*(r) The product of volt and watt is horse power*  
*(s) Watt hour can be measured in terms of electron volt*
- (A) All the four statements are correct  
(B) Statements (p) and (r) are correct  
(C) Statements (p), (q) and (s) are correct  
(D) Statements (s) and (r) are correct
12. The magnetism at the centre of a bar magnet is
- (A) Zero (B) Minimum  
(C) Maximum (D) None of these
13. Energy in the current carrying conductor is stored in the form
- (A) Heat energy (B) Chemical energy  
(C) Electric field (D) Magnetic field
14. A certain piece of copper is to be shaped into a conductor of maximum resistance. Its length and diameter should be respectively
- (A)  $l, d$  (B)  $2l, d/2$   
(C)  $l/2, 2d$  (D)  $l, d/2$
15. A rheostat is a resistor of
- (A) Fixed resistance (B) High resistance  
(C) Low resistance (D) Variable resistance

**CHEMISTRY (Q No: 16 to 25)**

16. The reaction in which two compounds exchange their ions to form two new compounds is
- (A) Displacement reaction (B) Double displacement reaction  
(C) Synthesis reaction (D) Decomposition reaction

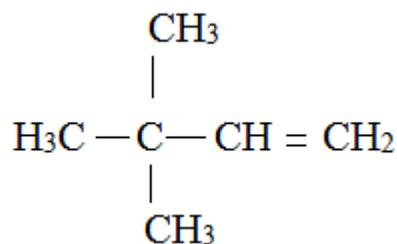
17. The base which does not contain metal is  
 (A) Dolomite (B) Caustic soda  
 (C) Caustic pattern (D) Ammonium hydroxide
18. The molecular formula of an ester is  $\text{HCOOCH}_3$ . The molecular formula of the alcohol and acid from which it might be prepared  
 (A)  $\text{CH}_3\text{COOH} + \text{CH}_3\text{OH}$  (B)  $\text{HCOOH} + \text{C}_2\text{H}_5\text{OH}$   
 (C)  $\text{HCOOH} + \text{CH}_3\text{OH}$  (D)  $\text{CH}_3\text{CH}_2\text{COOH} + \text{CH}_3\text{OH}$
19. The longest period in the periodic table of elements is  
 (A) 7<sup>th</sup> (B) 6<sup>th</sup>  
 (C) 5<sup>th</sup> (D) 1<sup>st</sup>
20. Read the following statements carefully and mark the correct option



- (A) Both the statements P and Q are true and Q is the correct explanation of P
- (B) Both the statements P and Q are true and Q is not the correct explanation of P
- (C) The statement P is true and Q is false
- (D) The statement P is false and Q is true

21. The IUPAC name of the compound given below is

- (A) 3, 3-Dimethyl-1-butane  
 (B) 2, 2-Dimethyl-3-butene  
 (C) 1, 1, 1-Trimethyl-2-propene  
 (D) 3, 3, 3-Trimethyl-1-propene



22. Match the following and select the correct option

Column A		Column B	
<b>P</b>	Sodium bicarbonate	<b>1</b>	Double salt
<b>Q</b>	Alum	<b>2</b>	Mixed salt
<b>R</b>	Bleaching powder	<b>3</b>	Acidic salt
<b>S</b>	Sodium chloride	<b>4</b>	Normal salt

	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>
<b>A</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>4</b>
<b>B</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>2</b>
<b>C</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>2</b>
<b>D</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>4</b>

23. Teflon is a

- (A) Insecticide (B) Drug  
(C) Polymer (D) Dye

24. An ionic bond can be formed between two atoms when

- (A) One of them has low ionization energy and the other has a high electron affinity  
(B) Both the atoms have low values of ionization energy  
(C) Both the atoms have high values of ionization energy  
(D) Both the atoms have low values of electron affinity

25. The non-polar part of soap molecule is made of

- (A) Sulphonate (B) Sulphate  
(C) Carboxylate (D) Hydrocarbons

**BIOLOGY (O No: 26 to 35)**

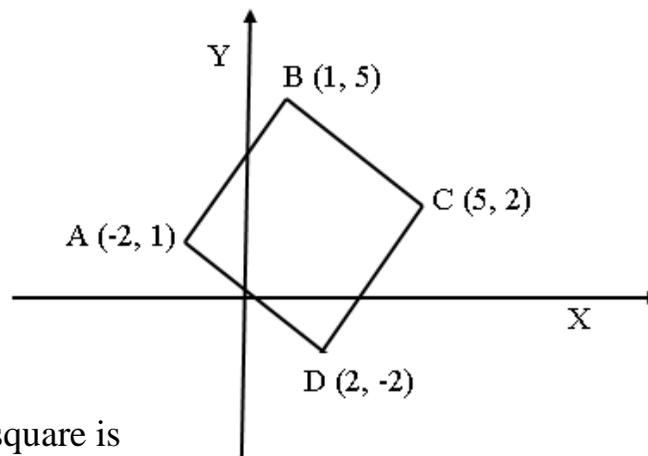
26. Which one of the following is used for measuring the rate of transpiration?  
(A) Osmometer (B) Porometer  
(C) Potometer (D) Moll's experiment
27. Balance and muscular coordination in human is the function of  
(A) Cerebrum (B) Cerebellum  
(C) Diencephalon (D) Pons
28. Roots of plants can absorb minerals from the soil, when they are in  
(A) Solid state (B) Liquid state  
(C) Gaseous state (D) Ionic state
29. Deficiency of phosphorus in plants  
(A) Retards protein formation  
(B) Brings about healthy root growth  
(C) Promote fruit ripening  
(D) None
30. Blood does not clot in the absence of Vitamin K because  
(A) An essential component of the clot  
(B) An essential component of the platelets  
(C) An essential for synthesis of prothrombin  
(D) An essential for synthesis of fibrinogen
31. When a monohybrid is crossed with its dominant parent, it is called  
(A) Reciprocal cross (B) Back cross  
(C) Test cross (D) Hybridisation
32. Which one of the following pairs is NOT CORRECTLY matched?  
(i) Implantation → Uterus  
(ii) Fertilization → Somniferous tubule  
(iii) Spermatogenesis → Fallopian tube  
(iv) Oogenesis → Ovarian follicle  
(A) (ii) & (iii) (B) (i) & (ii)  
(C) (i) & (iv) (D) (ii) only

33. When the left ventricle of human heart contracts
- (A) The oxygenated blood go into different body organs through pulmonary vein
  - (B) The deoxygenated blood is forced into the pulmonary artery
  - (C) The deoxygenated blood is pumped into the lungs through pulmonary artery
  - (D) The oxygenated blood is forced into the main artery
34. Homologous organs have
- (A) No common ancestral origin
  - (B) Same morphology and function
  - (C) Same morphology, different functions
  - (D) Different morphology and function, but common origin
35. Genetic drift is defined as
- (A) A random change in gene frequencies from one generation to the next
  - (B) A change in an allele due to alteration in the DNA molecule
  - (C) A change in gene frequencies due to exchange of genes between different populations
  - (D) A product of natural selection

**MATHEMATICS (O No: 36 to 60)**

36. Two numbers are in the ratio 9 : 8. If 8 is subtracted from both the numbers the ratio becomes 8 : 7. What is the difference between the two numbers?
- (A) 8
  - (B) 7
  - (C) 6
  - (D) 3
37. Mr. Rahul put the names of all the students of his class in a hat. The probability that he pulls out a boy's name at random is 3 out of 7. If there are 12 girls in the class, the number of boys is
- (A) 3
  - (B) 4
  - (C) 9
  - (D) 11

38. The ratio of the areas of the incircle to circum circle of a square is  
(A)  $1: \sqrt{2}$  (B)  $1: \sqrt{3}$   
(C)  $1: 4$  (D)  $1: 2$
39. If 12 men and 18 women can complete a work in 7 days. How long does it take for 4 men and 8 women to complete the same work?  
(A) 12 days (B) 9 days  
(C) 6 days (D) 3 days
40. A box contains 2 blue caps, 4 red caps, 5 green caps and 1 yellow cap. If three caps are picked at random, what is the probability that two are red and one is green?  
(A)  $\frac{9}{22}$  (B)  $\frac{6}{19}$   
(C)  $\frac{1}{6}$  (D)  $\frac{3}{22}$
41. The co ordinates of the vertices of a square are represented in the figure given below.



The area of the square is

- (A) 4 square units (B) 9 square units  
(C) 25 square units (D) 36 square units
42. The area of the largest triangle that can be inscribed in a semi-circle of radius 7cm is  
(A)  $14\text{cm}^2$  (B)  $49\text{cm}^2$   
(C)  $98\text{cm}^2$  (D)  $24.5\text{cm}^2$

43. The additive inverse of  $3x - 4 + \frac{x}{2x - 1}$  is

- (A)  $\frac{6x^2 - 10x + 4}{2x - 1}$  (B)  $-3x + 4 - \frac{x}{2x - 1}$   
 (C)  $-3x + 4 + \frac{x}{2x - 1}$  (D)  $-3x + 4 - \frac{x}{1 - 2x}$

44. The sum of the reciprocals of the roots of the equation  $x^2 + px + q = 0$  is

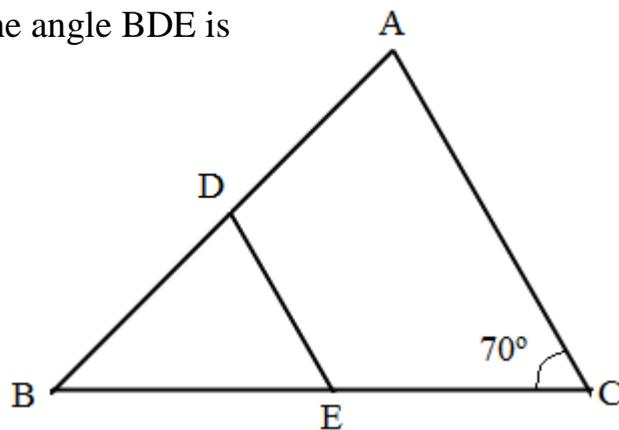
- (A)  $-\frac{p}{q}$  (B)  $\frac{p}{q}$   
 (C)  $\frac{q}{p}$  (D)  $-\frac{q}{p}$

45. The first four terms of an arithmetic sequence are **a, x, b, 2x**. the ratio of **a** to **b** is

- (A)  $\frac{1}{2}$  (B)  $\frac{3}{4}$   
 (C)  $\frac{1}{4}$  (D)  $\frac{1}{3}$

46. In the figure  $\triangle ABC$ , D and E are the midpoints of AB and BC respectively and angle C is  $70^\circ$ . Then the angle BDE is

- (A)  $140^\circ$   
 (B)  $35^\circ$   
 (C)  $70^\circ$   
 (D)  $110^\circ$



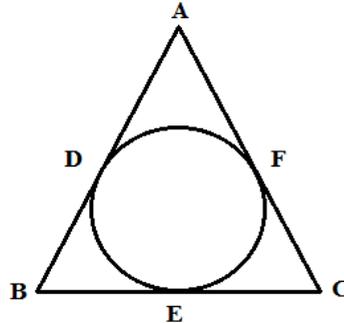
47. If A is acute and  $\frac{\cos^2 A}{\cot^2 A - \cos^2 A} = 3$  then A is

- (A)  $60^\circ$  (B)  $30^\circ$   
 (C)  $45^\circ$  (D)  $90^\circ$

48. The radius, circumference and area of a circle are  $r$ ,  $c$  and  $a$  respectively. Then,
- (A)  $\frac{c}{a} = \frac{r}{2}$  (B)  $rc = 2a$
- (C)  $ac = \frac{r^2}{4}$  (D)  $\frac{a}{r} = c$
49. Median of the scores 13, 23, 12, 18, 26, 19, 14, 25 and 11 is
- (A) 23 (B) 19
- (C) 18 (D) 14
50. The smaller wheel of a baby cycle has a radius of 14cm. One evening Pinky rides this cycle for some distance. The smaller wheel rotates 500 times while the bigger wheel 200 times. What is the diameter of the bigger wheel?
- (A) 28cm (B) 35cm
- (C) 56cm (D) 70cm
51. 3.24636363..... is
- (A) An integer (B) An irrational number
- (C) A rational number (D) Not a real number
52. The degree of the polynomial  $5$  is
- (A) 0 (B) 1
- (C) 2 (D) 5
53. The graph  $x = 5$  is
- (A) Parallel to x-axis
- (B) Parallel to y-axis
- (C) Perpendicular to y-axis
- (D) Perpendicular to x-axis
54. Three solid metallic spheres of radii 6cm, 8cm and 10cm are melted to form a single solid sphere. The radius of the sphere so formed is
- (A) 12cm (B) 16cm
- (C) 18cm (D) 24cm

55. A circle inscribed in triangle ABC having  $AB = 10\text{cm}$ ,  $BC = 12\text{cm}$ ,  $CA = 28\text{cm}$ , touching sides at D, E and F. Then  $AD + BE + CF$  is

- (A) 20cm
- (B) 25cm
- (C) 18cm
- (D) 22cm



56. If the HCF of 65 and 117 is expressible in the form  $65m - 117$ , then the value of  $m$  is

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

57. The pair of linear equations  $x - 2y = 5$  and  $2x - 4y = 10$  has

- (A) No Solution
- (B) One Solution
- (C) Two solutions
- (D) Infinitely many solutions

58. How can the relationship between  $x$  and  $y$  be best defined if values of  $x$  and  $y$  are as follows?

x	2	3	4	5	6
y	0	2	6	12	20

- (A)  $y = 2x - 4$
- (B)  $y = x^2 - 4x$
- (C)  $y = x^2 - 3x + 2$
- (D)  $y = x^2 - 4$

59. A shopkeeper sold a TV set for Rs. 17940, with a discount of 8% and gained 19.6%. If no discount is allowed, then what will be his gain percent?

- (A) 30%
- (B) 26.4%
- (C) 25%
- (D) 24.8%

60. How many packets each of 350grams can be prepared out of 7.70kg of sugar?

- (A) 11
- (B) 22
- (C) 110
- (D) 220

**SECTION: B**

61. An e – mail address typically consists of a user ID followed by the .....sign and the name of the e – mail server that manages the user’s electronic post office box.
- (A) @ (B) #  
(C) \* (D) &
62. When you save your data here it will remain intact even when the computer is turned off
- (A) RAM (B) Secondary Storage Device  
(C) Primary Storage Device (D) Motherboard
63. A collection of interrelated files in a computer is:
- (A) File Manager (B) Field  
(C) Record (D) Database
64. What is usually used for displaying information at public places?
- (A) Monitor (B) Overhead Projectors.  
(C) Monitor and Overhead Projectors (D) Touch Screen Kiosks
65. You are writing a message on twitter. What is the maximum number of characters you can use?
- (A) 120 (B) 140  
(C) 160 (D) 180
66. You have created a PowerPoint presentation that you want to embed on a web page. A site that enables you to do this is?
- (A) You Tube (B) Video  
(C) Sound Slide (D) Slide share
67. What is an E – mail attachment?
- (A) A receipt sent by the recipient  
(B) List of CC: or BCC: recipients  
(C) A separate document from another programme sent along with an E – mail message  
(D)None of these

68. "Me at the Zoo" is
- (A) The first video uploaded on You Tube
  - (B) The million video uploaded on You Tube
  - (C) The most unpopular video on You Tube
  - (D) The Most Popular video on You Tube
69. Identify this historical incident:
- (A) Russia after Revolution of 1917
  - (B) Germany after First World War
  - (C) Hiroshima after Bombing
  - (D) India after Quit India Movement



**Questions 70 to 72:** Read the following passage and answer the following:

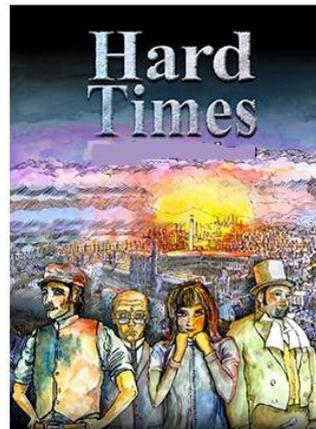
A one-day seminar on the topic 'Globalisation and Indian Society: Challenges and Prospects' was organized by the School of Social Science of Rani Channamma University at its Vidya Sangama campus in Belgaum on Wednesday.

Inaugurating the seminar, Vice-Chancellor B.R. Ananthan observed that globalization had resulted in development of newer systems of management, while the traditional practices were pushed back in the process. The recent decades were also marked by the development of a multi-cultural environment and host of opportunities opening up for the educated and skilled hands. He pointed out that modern technological developments had affected every sphere of human life. But, even while enhancing the quality of life, these developments had also caused cultural shocks, which were the real challenges before sociologists, who were expected to analyse and come out with proper solutions.

70. What was the Seminar topic?
- (A) Impacts of Globalization
  - (B) Globalization and Indian Society
  - (C) Globalization concern and expectation in Indian.
  - (D) Globalization

71. According to the passage which one of the following is not an impact of globalization?
- (A) Opportunities for skilled labours
  - (B) Modern technological development.
  - (C) Cultural deterioration
  - (D) Development in agriculture
72. What is the observation of B.R. Ananthan about globalization?
- (A) Globalization had resulted newer system of management and traditional systems were pushed back
  - (B) Development of multicultural activities
  - (C) New opportunities for skilled labour
  - (D) Improvement in the qualities of life
73. Who was the author of this famous novel?

- (A) Jane Eyre
- (B) Charles Dickens
- (C) Rudyard Kipling
- (D) Thomas Hardy

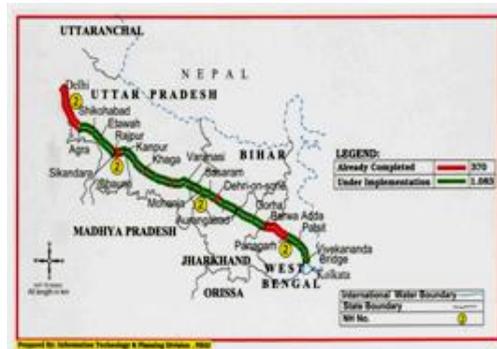


74. This news report published about the incident happened in:
- (A) France
  - (B) Germany
  - (C) United States of America
  - (D) Former USSR



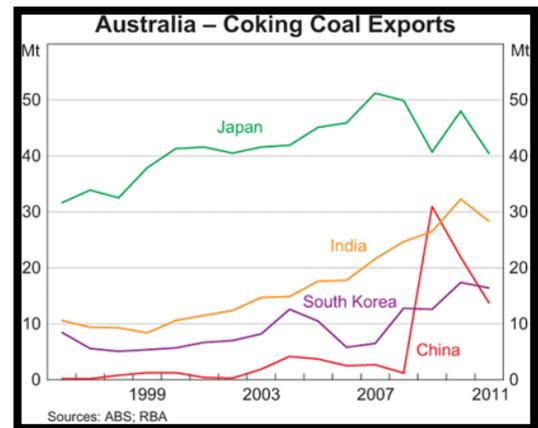
75. Identify this national highway of India

- (A) NH1
- (B) NH2
- (C) NH 17
- (D) NH 7



76. Which one of the following statements is true related to the graph given below:

- (A) Coal export of Australia constantly increasing to all the countries
- (B) South Korea is the second largest coal buyer of Australia
- (C) Throughout the period Chinese import shows fluctuations



- (D) 2011 onwards Indian coal import started to increase

**Questions 77 and 78:** Read the following paragraph and answer the questions 77 and 78

Cultivation of this crop is possible only in areas with good rainfall, as the crop requires standing water for growth. A monthly rainfall of 100-200 mm is a must and about 125 cm is during vegetative season. And there should be no water at ripening stage, being a tropical and sub-tropical plant, it requires a fairly high temperature, ranging from 20° to 40°C. The optimum temperature of 30°C during day time and 20°C during night time is considered favorable for its growth and development.

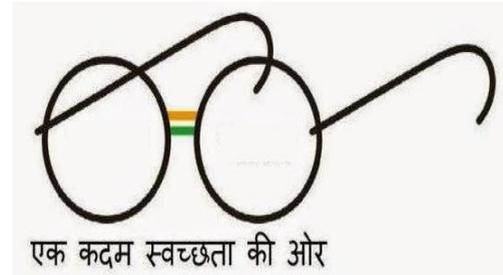
77. The above natural condition is favourable for the cultivation of:

- (A) Rice
- (B) Wheat
- (C) Bajra
- (D) Corn

78. What is the meaning of 'tropical and subtropical crop'?
- (A) Crop which grows in tropical and subtropical region  
 (B) Crop requires high Temperature.  
 (C) Crop requires less rainfall  
 (D) Crop requires temperate climate

79. Identify the logo:

- (A) Gandhi Jayanthi Celebration  
 (B) Indian Villages  
 (C) Jana Jagaran  
 (D) Swachha Bharath



80. Which one of the following quality mark you need to see when you are purchasing gold ornaments



(A)



(B)



(C)



(D)

81. Among the following, who are eligible to benefit from the Mahatma Gandhi National Rural Employment Guarantee Act?

- (A) Adult members of only the scheduled Castes and scheduled Tribe household  
 (B) Adult members of below poverty line  
 (C) Adult members of any household who are ready to work  
 (D) Members of backward community

82. The preamble of the Indian constitution adopted on 26<sup>th</sup> November 1949, did not include the terms?

- (A) Socialist (B) Secular  
 (C) Republic (D) Democratic

83. Jaffna railway station and Yal Devi Train were recently in news because:

- (A) Due to bomb explosion
- (B) New Railway station was constructed
- (C) Train accident
- (D) After 25 years train service started between Colombo and Jaffna



84. FIFA World Cup - 2018 will be held in

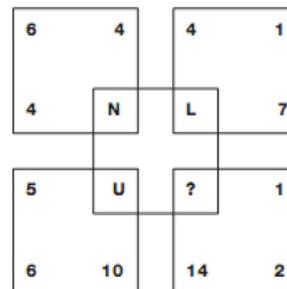
- (A) London
- (B) Russia
- (C) Qatar
- (D) South Africa

85. Which one of the following is NOT a correct statement about (Continues and Comprehensive Evaluation) CCE?

- (A) The performance of a child has been evaluated all the days in school.
- (B) The main aim of education is holistic development of a child
- (C) It is activity based learning
- (D) It is giving more importance on Non Academic Activities.

86. Replace the question mark.

- (A) Q
- (B) R
- (C) S
- (D) M



87. Which of the following pairs of the words have the same relation as IMPORT: EXPORT?

- (A) EXPENDITURE: DEFICIT
- (B) EXPENDITURE: DEBT
- (C) EXPENDITURE: REVENUE
- (D) EXPENDITURE: TAX

88. Replace the question mark.

- (A) C
- (B) Y
- (C) X
- (D) Z

N	252	R
T	500	Y
Y	400	P
K	132	L
G	182	?

**Questions 89 and 90:** A series of numbers/letters is followed by a blank space with a question mark. Choose the correct option from the given alternatives.

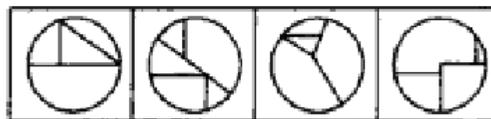
89.            1     3     3     6     ?     12   21   15

- (A) 12
- (B) 13
- (C) 14
- (D) 15

90.            0     3     8     15   ?     35   48

- (A) 18
- (B) 20
- (C) 22
- (D) 24

91. Among the four answer figures which one can be formed by using the given cut – out pieces?



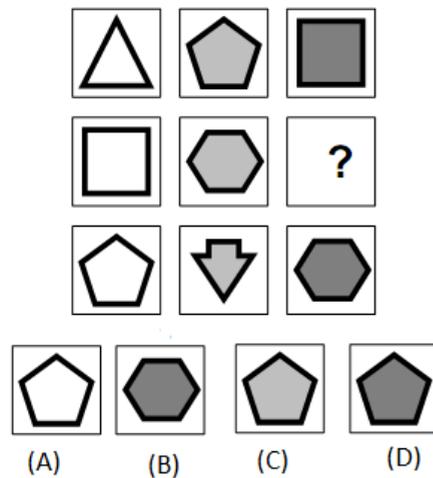
- (A)
- (B)
- (C)
- (D)

92. Replace the question mark:

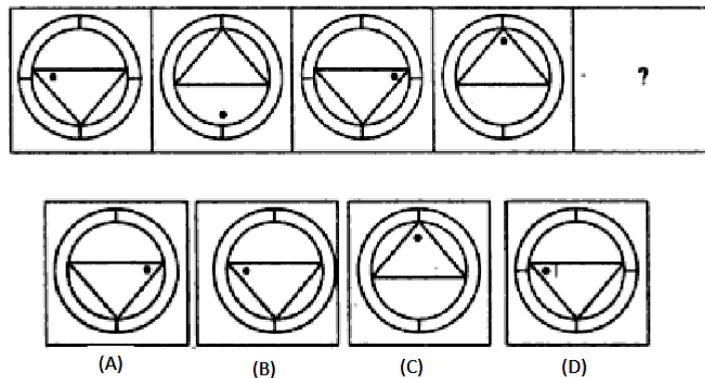
35	30	27
31	26	23
28	23	?

- (A) 19      (B) 20      (C) 21      (D) 18

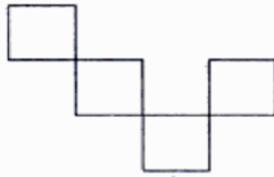
93. Replace the question mark.



94. Replace the question mark:

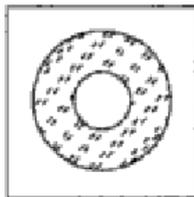


95. How many squares must be added to the following figure in order to make one large perfect square, retaining the given square where they are in the given square?



- (A) 14                      (B) 8                      (C) 12                      (D) 14

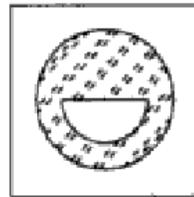
96. Find the odd one out:



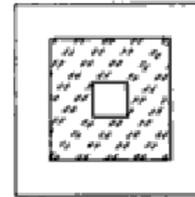
(A)



(B)

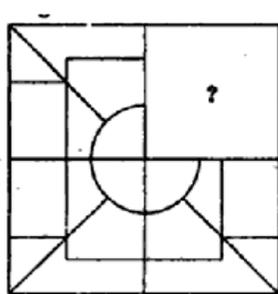


(C)

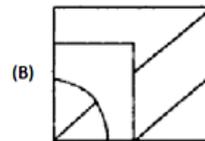


(D)

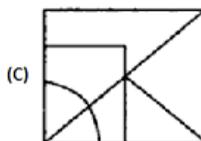
97. Complete the figure:



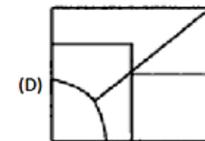
(A)



(B)

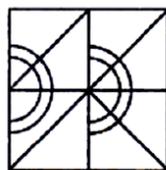
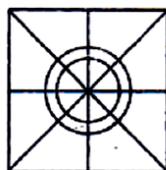


(C)

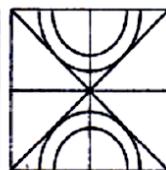


(D)

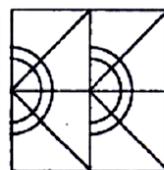
98. Select the figure that can be rearranged to form the main figure:



(A)



(B)



(C)



(D)

**Questions 99 and 100:** The number in each question below is to be coded as

***Follows:***

<b>Numbers</b>	<b>4</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>9</b>	<b>0</b>	<b>6</b>
<b>Codes</b>	<b>H</b>	<b>P</b>	<b>D</b>	<b>Z</b>	<b>F</b>	<b>S</b>	<b>A</b>	<b>K</b>	<b>M</b>	<b>C</b>

99. Find the correct code for 93014.

- (A) KFMDH      (B) KFDMH      (C) KMFDH      (D) KFMDK

100. Find the correct code for 671542

- (A) CPDZHS      (B) CPDHSZ      (C) DPCSHZ      (D) CPDSHZ

**SPACE FOR ROUGH WORK**