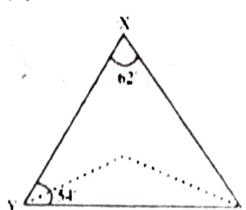


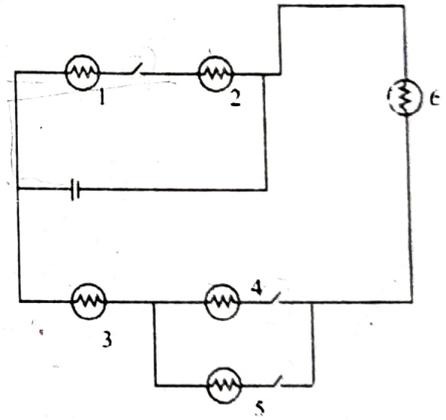
## +2 AMU Sci./ Dip. Engg. 2014-2015

1. The value of  $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$  is:  
 (a) 0 (b) 1  
 (c) 2 (d) None of these
2. The two roots of the equations  $a(b-c)x^2 + b(c-a)x + c(a-b) = 0$  are 1 and:  
 (a)  $\frac{c(a-b)}{b(c-a)}$  (b)  $\frac{b(c-a)}{a(b-c)}$   
 (c)  $\frac{a(b-c)}{b(c-a)}$  (d)  $\frac{c(a-b)}{a(b-c)}$
3. If the points (2,3), (4,k) and (6,-3) are collinear, then the value of k is:  
 (a) 0 (b) 2 (c) -2 (d) 4
4. ABCD is a rhombus and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA the quad PQRS is a:  
 (a) Rectangle (b) Parallelogram  
 (c) Triangle (d) Rhombus
5. If the points A(5,2), B(4,7) and C(7,-4) form a triangle ABC, then the area of triangle is equal to:  
 (a) -4 (b) 4 (c) +2 (d) 5
6. If the roots of the quadratic equation  $(a^2+b^2)x^2 - 2b(a+c)x + (b^2+c^2) = 0$  are equal, then:  
 (a)  $2b=a+c$  (b)  $b^2=ac$   
 (c)  $b = \frac{2ac}{a+c}$  (d)  $b=ac$
7. If  $\bar{x}$  is the mean of  $x_1, x_2, x_3, \dots, x_n$ , then mean of  $(x_1+k), (x_2+k), (x_3+k), \dots, (x_n+k)$  will be  
 (a)  $\bar{x}$  (b)  $k\bar{x}$   
 (c)  $k$  (d)  $\bar{x}+k$
8. Two dice are thrown simultaneously. What is the probability of getting a doublet?  
 (a)  $1/6$  (b)  $1/12$   
 (c)  $5/18$  (d)  $11/36$
9. In  $\Delta ABC$ , D is the mid-point of BC. E is the mid-point of DC and O is the mid-point of AE. The ratio of areas of  $\Delta AOC$  and  $\Delta ABC$  is:  
 (a) 1:6 (b) 1:7  
 (c) 1:8 (d) 1:9
10. The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. The radius of the circle is equal to:  
 (a) 5cm (b) 3cm  
 (c) 4cm (d) 8cm
11. In the adjoining figure if YO and ZO are the bisectors of  $\angle Y$  and  $\angle Z$  then  $\angle YOZ$  equals to:  
  
 (a)  $121^\circ$  (b)  $36^\circ$  (c)  $40^\circ$  (d)  $25^\circ$
12. 5 pencils 7 pens together cost Rs. 50 whereas 7 pencils and 5 pens together cost Rs. 46, then the cost of one pencil is equal to:  
 (a) Rs. 5 (b) Rs. 7  
 (c) Rs. 3 (d) Rs. 9
13. The area of a sector of a circle with radius 6cm, if angle of the sector is  $60^\circ$  is equal to:  
 (a)  $\frac{132}{7} \text{ cm}^2$  (b)  $\frac{135}{7} \text{ cm}^2$   
 (c)  $130 \text{ cm}^2$  (d)  $135 \text{ cm}^2$
14. The diagonals of parallelogram are:  
 (a) Bisect each other (b) Equal  
 (c) Perpendicular to each other  
 (d) None of these
15. Sum of the  $n$  term of the series  $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$  is:  
 (a)  $\frac{n(n+2)}{\sqrt{2}}$  (b)  $\sqrt{2}(n)(n+1)$   
 (c)  $\frac{n(n+1)}{\sqrt{2}}$  (d) None of these
16. If  $\alpha$  and  $\beta$  are the zeroes of the quadratic polynomial  $x^2 - 2x - 8$ , then  $\alpha + \beta + \alpha\beta$  is:  
 (a) 6 (b) -6  
 (c) -10 (d) 10
17. The quadratic polynomial formed by the reciprocal of zeroes of the quadratic polynomial  $x^2 - 3x + 2$  is:  
 (a)  $-3x^2 + x + 2$  (b)  $2x^2 - 3x + 1$   
 (c)  $x^2 + 2x - 3$  (d)  $2x^2 + 3x - 1$
18. If  $\Delta ABC \sim \Delta DEF$  and their areas be, respectively  $64 \text{ cm}^2$  and  $121 \text{ cm}^2$ . If  $EF = 15.4 \text{ cm}$  then the value of BC is:  
 (a) 15cm (b) 12cm  
 (c) 11.2cm (d) 18cm
19. Two poles of heights 6m and 11m stand on a plane ground. If the distance between the feet of the poles is 12m. The distance between their tops equal to:  
 (a) 13m (b) 14m  
 (c) 15m (d) 20m
20. If zeroes of the polynomial  $x^3 - 3x + x + 1$  are  $a-b, a, a+b$ , find a and b.  
 (a)  $a=2, b=\pm\sqrt{3}$  (b)  $a=1, b=\pm\sqrt{2}$   
 (c)  $a=3, b=0$  (d)  $a=\sqrt{2}, b=\sqrt{3}$
21. In  $\Delta ABC$ , 'E' is the mid-point of median AD then,  $\text{ar}(\Delta BED) =$   
 (a)  $1/3 \text{ ar}(\Delta ABC)$  (b)  $1/4 \text{ ar}(\Delta ABC)$   
 (c)  $1/8 \text{ ar}(\Delta ABC)$  (d)  $1/6 \text{ ar}(\Delta ABC)$
22. ABCD is a parallelogram. X and Y are the mid-points of BC and CD respectively, then  $\text{ar}(\Delta AXY)$  is equal to:  
 (a)  $1/2 \text{ ar}(\Delta ABCD)$  (b)  $1/4 \text{ ar}(\Delta ABCD)$   
 (c)  $3/4 \text{ ar}(\Delta ABCD)$  (d)  $3/8 \text{ ar}(\Delta ABCD)$

23. If  $y + \frac{1}{4y} = 2$  then the value of  $16y^3 + \frac{1}{4y^3}$  is:  
 (a) 102 (b) 104  
 (c) 105 (d) 106
24. A river 3m deep and 40m wide is flowing at the rate of 2km per hour into the sea. How much water will fall into the sea in a minute?  
 (a)  $400m^3$  (b)  $2400m^3$   
 (c)  $4000m^3$  (d)  $4200m^3$
25. If  $\alpha + \beta = 90^\circ$  and  $\alpha = 2\beta$ , then  $\cos^2\alpha + \sin^2\beta$  is equal to:  
 (a) 1 (b) 0  
 (c)  $1/2$  (d)  $2$
26. ABC is a right triangle, right angled at C. Let  $BC = a$ ,  $CA = b$ ,  $AB = c$  and let  $p$  be the length of perpendicular from C on AB, then  $\frac{1}{p^2}$  is equal to:  
 (a)  $\frac{1}{a^2} + \frac{1}{b^2}$  (b)  $\frac{1}{a^2} - \frac{1}{b^2}$   
 (c)  $\frac{1}{a^2 + b^2}$  (d)  $\frac{1}{a^2 b^2}$
27. The value of  $\left(\frac{x^b}{x^c}\right)^{\frac{1}{bc}} \left(\frac{x^c}{x^a}\right)^{\frac{1}{ca}} \left(\frac{x^a}{x^b}\right)^{\frac{1}{ab}}$  on simplifying is:  
 (a) x (b)  $1/x$   
 (c) 1 (d) -1
28. If the points  $(a, -11)$ ,  $(5, b)$ ,  $(2, 15)$  and  $(1, 1)$  are the vertices of a parallelogram taken in order, then the values of a and b are:  
 (a)  $a = 4, b = -3$  (b)  $a = -4, b = 3$   
 (c)  $a = -4, b = -3$  (d)  $a = 4, b = 3$
29. If the volume of a right circular cone is  $9856cm^3$  and diameter of base is 28cm then slant height of cone is:  
 (a) 49cm (b) 50cm  
 (c) 60cm (d) 20cm
30.  $(x+y)^3 - (x-y)^3 - 6y(x^2 - y^2)$  is equal to:  
 (a)  $x+y$  (b)  $x-y$   
 (c)  $8x^3$  (d)  $8y^3$
31. Single circular chromosome is found in:  
 (a) Human cell (b) Amoeba  
 (c) Plant cell (d) Bacteria
32. The solution used to stain cell is / are:  
 (a) Iodine (b) Safranin  
 (c) Methylene blue (d) All of these
33. A pteridophytic plant is:  
 (a) Bird-wing (b) Flying-fox  
 (c) Horse-tail (d) None of these
34. This is an alga:  
 (a) Marsilea (b) Riccia  
 (c) Spirogyra (d) Marchantia
35. A 'rabi' crop is:  
 (a) Rice (b) Maize  
 (c) Wheat (d) Cotton
36. If a cell is kept in a hypertonic solution, it will:  
 (a) Swell up (b) Shrink  
 (c) Swim in a side (d) Stay the same size
37. In plants, autotrophic mode of nutrition requires:  
 (a) Sunlight (b) Chlorophyll  
 (c)  $CO_2$  and  $H_2O$  (d) All the above
38. Phototropism in plants is controlled by:  
 (a) Cytokinins (b) Gibberellins  
 (c) Auxins (d) Abscisic acid
39. An example of micro-nutrient of the crop plant is:  
 (a) Manganese (b) Sulphur  
 (c) Potassium (d) Oxygen
40. Xylem and phloem tissues are found in:  
 (a) Fern (b) Moss  
 (c) Riccia (d) Marchantia
41. The site of complete digestion of food is:  
 (a) Stomach (b) Duodenum  
 (c) Small intestine (d) Large intestine
42. Which of the following organism reproduces by multiple fission?  
 (a) Leishmania (b) Amoeba  
 (c) Malaria parasite (d) Both (a) and (b)
43. Brown Swiss is an exotic breed of:  
 (a) Cow (b) Hen  
 (c) Buffalo (d) Wheat
44. Bombay duck and tuna are examples of:  
 (a) Fresh water fishes (b) Marine fishes  
 (c) Honey-bees (d) Poultry birds
45. Japanese encephalitis or brain fever is caused by:  
 (a) Bacteria (b) Virus  
 (c) Protozoan (d) Fungus
46. Which of these is not a true fish?  
 (a) Jelly fish (b) Flying fish  
 (c) Sea horse (d) Lion fish
47. Fungal cell wall is made up of:  
 (a) Lignin (b) Suberin  
 (c) Chitin (d) Cellulose and pectin
48. The five kingdom classification was given by:  
 (a) Carl Woese (b) Carolus Linnaeus  
 (c) Ernst Haeckel (d) Robert Whittaker
49. Eosinophil and basophil cells are found in:  
 (a) Cartilage (b) Areolar tissue  
 (c) Adipose tissue (d) Blood
50. Solid matrix of cartilage is made up of:  
 (a) Proteins and sugar  
 (b) Calcium and phosphorus  
 (c) Proteins and calcium carbonate  
 (d) Proteins and phosphorus

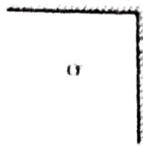
51. Ibn Battuta visited India during the reign of:  
 (a) Balban (b) Alauddin Khalji  
 (c) ~~Muhammad bin Tughluq~~  
 (d) Firuz Tughluq
52. Who among the following is known as the 'Flying Sikh of India'?  
 (a) ~~Milkha Singh~~ (b) Ajit Pal Singh  
 (c) Joginder Singh (d) Mohinder Singh
53. Border Security Force was established in the year:  
 (a) ~~1965~~ (b) 1966  
 (c) 1967 (d) 1968
54. Maulvi Ahmadullah of Faizabad led the Revolt of 1857 in:  
 (a) Delhi (b) Central India  
 (c) Bihar (d) ~~Kohilkhand~~
55. Who among the following had constructed the Red Fort in Delhi?  
 (a) Akbar (b) Jahangir  
 (c) ~~Shah Jahan~~ (d) Aurangzeb
56. Arvind Kejriwal the leader of the Aam Admi Party (AAP) has served in which of these services?  
 (a) Indian Administrative Service (IAS)  
 (b) Indian Foreign Service (IFS)  
 (c) ~~Indian Revenue Service (IRS)~~  
 (d) Indian Police Service (IPS)
57. Sultan Azlan Shah Cup is associated with:  
 (a) Football (b) ~~Hockey~~  
 (c) Basketball (d) Cricket
58. Who was the first woman speaker of the Lok Sabha?  
 (a) ~~Najma Haptullah~~ (b) Sarojini Naidu  
 (c) ~~Meira Kumar~~ (d) Sushma Swaraj
59. Telecom Company 'Nokia' belongs to which country?  
 (a) USA (b) ~~Finland~~  
 (c) Sweden (d) France
60. Buland Darwaza at Fatehpur Sikri was constructed by Akbar to commemorate the:  
 (a) Birth of Prince Salim  
 (b) ~~Victory of Gujarat~~  
 (c) Victory of Malwa  
 (d) Victory of Bengal
61. Real name of Nurjahan wife of Jahangir was:  
 (a) ~~Mehrun Nisa~~ (b) Mahinoor  
 (c) Qaisar Jahan (d) Jodha Bai
62. Sir Syed Ahmad Khan wrote Tafsir of:  
 (a) ~~Bible~~ (b) Zuboor  
 (c) Sahifa-e-Ibrahim (d) ~~None of the above~~
63. Quran was revealed to prophet Muhammad (P.B.U.H.) at:  
 (a) ~~Mekkah and Medina~~  
 (b) Medina and Kufa  
 (c) Mekka and Taif  
 (d) Mekka and Habsha

64. Battle of Uhad was fought in:  
 (a) ~~Medina~~ (b) Mekkah  
 (c) Syria (d) Kufa
65. Where is Masjid-i-Nabwi?  
 (a) Habsha (b) Mekkah  
 (c) ~~Medina~~ (d) Taif
66. Who was famous with the title of "Ameen" in Mekkah?  
 (a) Hazrat Abdullah  
 (b) Hazrat Abdul Muttalib  
 (c) ~~Hazrat Mohammad (SAW)~~  
 (d) Hazrat Ibrahim
67. The following is known traditionally as Hadith:  
 (a) The word of God  
 (b) ~~Saying, doing and approval of the prophet~~  
 (c) Saying of the companion of the prophet  
 (d) None of these
68. Compilation of the Quran was done during the period of the Companion:  
 (a) ~~Hazrat Abu Bakr Siddique~~  
 (b) Hazrat Umar Farooque  
 (c) Hazrat Salman Farsi  
 (d) Hazrat Ali
69. The Islamic calendar is called:  
 (a) ~~Hijri~~ (b) Shamsi  
 (c) Abbasid (d) Arabic
70. Agreement of Sulah Hudaibiyah was settled in:  
 (a) 7AH (b) ~~6AH~~  
 (c) 9AH (d) 10AH
71. In the electric circuit shown below:



- (a) All the bulbs will glow  
 (b) Only bulbs, 4, 5 and 6 will glow  
 (c) Only bulb 3 will glow  
 (d) ~~None of the bulbs will glow~~
72. The specific resistance of a rod of copper as compared to that of thin wire of copper is:  
 (a) More (b) Less (c) Same  
 (d) Depends upon the length and area of wire
73. Two mirrors are placed at right angles to each other as shown in the figure. The total number of images of an object, O, placed between them, are seen as:

- (a) Two
- (b) Three
- (c) Four
- (d) Six



74. The echo of a sonar beep is heard 2.50 s later. If the speed of sound in the water is  $1400 \text{ ms}^{-1}$ ; the iceberg is at the distance:

- (a) 3500 m
- (b) 1900 m
- (c) 175 m
- (d) 142 m

75. An electric bulb is rated 220V and 100W. When it is operated on 110V, the power consumed will be:

- (a) 100W
- (b) 75W
- (c) 50W
- (d) 25W

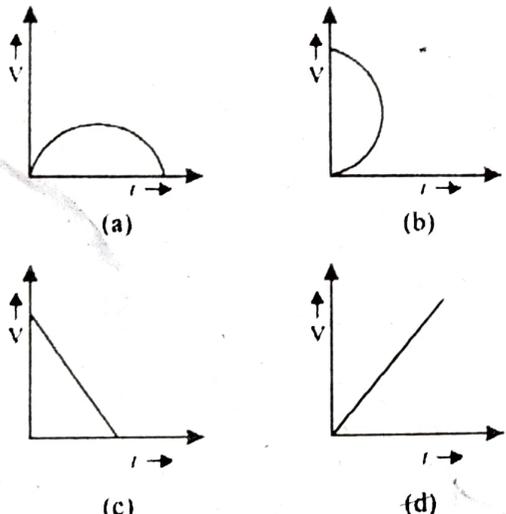
76. A body floats with  $\left(\frac{1}{3}\right)$  of its volume outside water and  $\left(\frac{3}{4}\right)$  of its volume outside another liquid. The density of the another liquid is:

- (a)  $\left(\frac{9}{4}\right) \times 10^3 \text{ kg m}^{-3}$
- (b)  $\left(\frac{4}{9}\right) \times 10^3 \text{ kg m}^{-3}$
- (c)  $\left(\frac{8}{3}\right) \times 10^3 \text{ kg m}^{-3}$
- (d)  $\left(\frac{3}{9}\right) \times 10^3 \text{ kg m}^{-3}$

77. If you read a book placed at distance 35.0 cm from your eye and the distance from eye lens to retina is 19.0 mm the focal length of your eye lens is:

- (a) 3.50cm
- (b) 5.93cm
- (c) 2.00cm
- (d) 1.89cm

78. Which of the following cannot be speed-time graph of a body in motion?



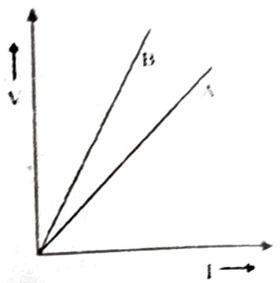
79. What is the momentum of a body of mass 100g, having a K.E. of 20J?

- (a)  $2 \text{ kgms}^{-1}$
- (b)  $\frac{1}{2} \text{ kgms}^{-1}$
- (c)  $12 \text{ g cm s}^{-1}$
- (d) none of these

80. In order to calculate the gravitational force of attraction Sir Isaac Newton had made use of:

- (a) The planet revolve around the Sun in elliptical orbit with the Sun at one of its foci
- (b) The line joining the planet and the Sun sweeps equal areas in equal intervals of time
- (c) The cube of the mean distance of a planet from the Sun is proportional to the square of its orbital period
- (d) Gravitational force is proportional to the rate of change in momentum

81. The V-I graphs of parallel and series combinations of two metallic resistors are shown in the figure below. The graph that represent parallel combination is:

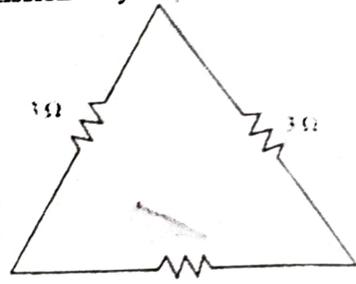


- (a) A
- (b) B
- (c) both A and B
- (d) none

82. Which one of the following take(s) place in hydrogen bomb while detonating:

- (a) Fission only
- (b) Fusion only
- (c) First fission then fusion only
- (d) First fusion then fission only

83. Three resistors of resistance  $3\Omega$  each are combined to form an equilateral triangle. Resistance between any two ends of the triangle would be:



- (a)  $\frac{1}{2} \Omega$
- (b)  $2\Omega$
- (c)  $6\Omega$
- (d)  $9\Omega$

84. Kinetic energy of a car, when its speed is tripled, is increased by the factor:

- (a) 3
- (b) 4
- (c) 9
- (d) 27

85. When a potential difference of 3.0 V across a resistor set up a current of 0.6A in it to flow. The potential difference required to set up the current of 0.4A in the resistor:

- (a) 1.0V
- (b) 2.0V
- (c) 3.0V
- (d) 4.0V

86. Gold can be dissolved in:

- (a) Hydrochloric acid
- (b) Nitric acid
- (c) Steam
- (d) Aqua regia

87. Mixing an acid with water results in:

- (a) Decrease in the concentration of  $\text{H}_3\text{O}^+$  ions per unit volume
- (b) Increase in the concentration of  $\text{H}_3\text{O}^+$  ions per unit volume

- (c) The concentration of  $\text{H}_3\text{O}^+$  ions per unit volume remains same  
(d) Absorption of heat
88. Which gas is produced when sodium reacts with ethanol?  
(a) Hydrogen (b) Carbon monoxide  
(c) Carbon dioxide (d) Water vapours
89. When a metal 'X' reacts with cold water, it produces hydrogen gas and metal hydroxide having formula  $\text{XOH}$ . Its balanced chemical equation is below:  
$$2\text{X} + 2\text{H}_2\text{O} \rightarrow 2\text{XOH} + \text{H}_2$$
  
If the molecular mass of  $\text{XOH}$  is 40. The name of metal 'X' is:  
(a) Calcium (b) Potassium  
(c) Magnesium (d) Sodium
90. The electronic configuration of the element  ${}_{20}^{40}\text{X}$  is:  
(a) 2,8,10 (b) 2,8,8,2  
(c) 2,10,8 (d) 2,8,18,8,4
91. A solution reacts with crushed egg shells to give a gas that turns lime water milky. The solution contains:  
(a)  $\text{NaCl}$  (b)  $\text{KCl}$   
(c)  $\text{HCl}$  (d)  $\text{CaCl}_2$
92. Aqua regia is a freshly prepared mixture of:  
(a) 3:1 concentrated sulphuric acid and concentrated nitric acid  
(b) 3:1 concentrated hydrochloric acid and concentrated sulphuric acid  
(c) 3:1 concentrated hydrochloric acid and concentrated nitric acid  
(d) 3:1 concentrated nitric acid and water
93. Which of the following pairs will give displacement reactions?  
(a)  $\text{NaCl}$  solution and copper metal  
(b)  $\text{MgCl}_2$  solution and aluminium metal  
(c)  $\text{FeSO}_4$  solution and silver metal  
(d)  $\text{AgNO}_3$  solution and copper metal
94. Formula units mass of  $\text{CaCl}_2$  is:  
(a) 70u (b) 82u  
(c) 111u (d) 63u
95. 1 mole of nitrogen gas is equal to:  
(a) 14g (b) 7g  
(c) 28g (d) 42g
96. The valency of Fe in  $\text{Fe}_2\text{O}_3$  is:  
(a) 2 (b) 3  
(c) 4 (d) 5
97.  $\text{Na}_2\text{SO}_4(\text{aq}) + \text{BaCl}_2(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}(\text{aq})$   
The above reaction  
(a) Combustion reaction  
(b) Combination reaction  
(c) Displacement reaction  
(d) Double-displacement reaction
98. Phenolphthalein gives pink colour in:  
(a) Acidic medium (b) Basic medium  
(c) Neutral medium (d) Both acidic and basic
99.  $\text{HCl}$  dissolves in water and give \_\_\_\_\_ and  $\text{Cl}^-$  ion.  
(a)  $\text{H}^+$  (b)  $\text{OH}^-$   
(c)  $\text{H}_3\text{O}^+$  (d) None of the above
100. Plaster of paris on mixing with water changes to:  
(a)  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$  (b)  $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$   
(c)  $(\text{CaSO}_4)_2 \cdot \frac{1}{2}\text{H}_2\text{O}$  (d)  $\text{CaSO}_4 \cdot \text{H}_2\text{O}$

### Answers

1.	a	2.	d	3.	a	4.	b	5.	c	6.	b	7.	d	8.	a	9.	c	10.	b
11.	a	12.	c	13.	a	14.	a	15.	c	16.	b	17.	b	18.	c	19.	a	20.	b
21.	b	22.	a	23.	a	24.	c	25.	c	26.	a	27.	c	28.	d	29.	b	30.	d
31.	d	32.	d	33.	c	34.	c	35.	c	36.	b	37.	d	38.	c	39.	a	40.	a
41.	c	42.	c	43.	a	44.	b	45.	b	46.	a	47.	c	48.	d	49.	d	50.	a
51.	c	52.	a	53.	a	54.	d	55.	c	56.	c	57.	b	58.	c	59.	b	60.	b
61.	a	62.	a	63.	a	64.	a	65.	c	66.	c	67.	b	68.	a	69.	a	70.	b
71.	d	72.	c	73.	c	74.	c	75.	d	76.	a	77.	c	78.	b	79.	a	80.	c
81.	a	82.	c	83.	b	84.	c	85.	b	86.	d	87.	b	88.	a	89.	d	90.	b
91.	b	92.	c	93.	d	94.	c	95.	c	96.	b	97.	d	98.	b	99.	c	100.	a