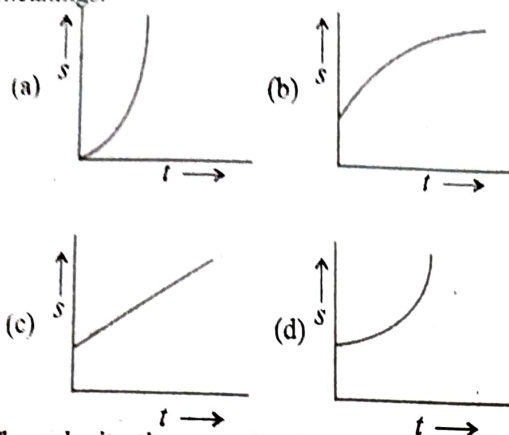


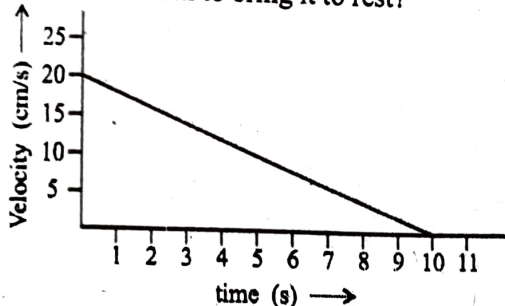
+2 A.M.U. Science/Dip. Engg.

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Which of the following graph is represented by $S = ut + \frac{1}{2}at^2$? Symbols have their usual meanings.



The velocity-time graph of a ball of mass 20 g moving along a straight line on a long table is given in figure. How much force does the table exert on the ball to bring it to rest?



- (a) -0.0004 N (b) $+0.0004$ N
(c) -0.0004 dyne (d) $+0.0004$ dyne

The astronauts in the space shuttle orbiting the earth are weightless because

- (a) they are so far from the earth that gravity is too weak to be noticed.
(b) a gravitational field cannot act in the vacuum of space.
(c) they are in a state of free fall.
(d) the gravitational force of the moon balances that of the earth.

An object thrown at a certain angle from the ground moves in a curved path and falls back to the ground. The initial and the final points of the path of the object lie on the same horizontal line. What is the work done by the force of gravity on the object?

- (a) 9.8 J (b) 9.8 erg
(c) 980 erg (d) zero

A boy of 50 kg runs up a staircase of 45 steps in 9 seconds. If the height of each step is 15 cm, his power is (taking $g = 10 \text{ ms}^{-2}$)

- (a) 375 W (b) 500 W
(c) 37.5 W (d) 3.75 W
6. The relative density of silver is 10.8. The density of water is 10^3 kg m^{-3} . The density of silver is
(a) 108 kg m^{-3} (b) $10.8 \times 10^3 \text{ kg m}^{-3}$
(c) 1.08 kg m^{-3} (d) None of the above

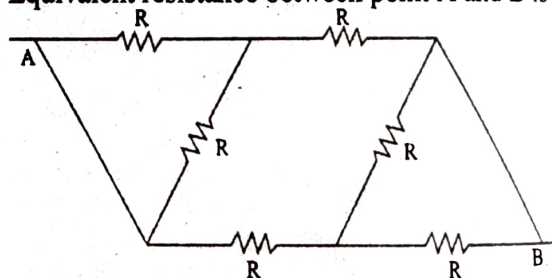
7. Which one of the following statements is correct about speed of sound?
(a) The speed of sound depends on nature of the medium only
(b) The speed of sound depends on temperature of the medium only
(c) The speed of sound depends on pressure of the medium only
(d) The speed of sound depends on all above factors

8. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object?
(a) Between the principal focus and the centre of curvature
(b) At the centre of curvature
(c) Beyond the centre of curvature
(d) Between the pole of the mirror and its principal focus

9. The clear sky is blue and sunset red because
(a) The nitrogen in the air has a blue colour
(b) The oxygen in the air has a blue colour
(c) Air molecules scatter more red light than blue light
(d) Air molecules scatter more blue light than red light

10. A myopic person has a far point for distinct vision at 5.6 m. What focal length spectacle lenses does he need to see distant objects distinctly?
(a) infinite (b) zero (c) 12.2m (d) 560cm

11. A network of six identical resistors, each of value R is made as shown in the figure. Equivalent resistance between point A and B is



- (a) $R/4$ (b) $3R/4$
(c) $4R/3$ (d) $3R$

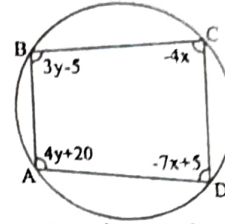
12. A cell, an ammeter and a voltmeter are all connected in series. The ammeter reads a current I and the voltmeter a potential difference V . If a torch bulb is connected across the voltmeter, then
 (a) both I and V will increase
 (b) both I and V will decrease
 (c) I will increase but V will decrease
 (d) I will decrease but V will increase
13. The essential difference between an AC generator and a DC generator is that
 (a) AC generator has an electromagnet while a DC generator has a permanent magnet
 (b) DC generator generates a higher voltage
 (c) AC generator generates a higher voltage
 (d) AC generator has slip rings while the DC generator has a commutator
14. A stream of electrons is projected horizontally towards the right. If a magnet brought near the electron beam produces a field directed downward then the electron beam bends
 (a) downward (b) upward
 (c) into the page (d) out of the page
15. In the nuclear reaction, ${}^3_1\text{H} + {}^2_1\text{H} \rightarrow {}^4_2\text{He} + X + \text{Energy}$, the particle 'X' is
 (a) α (b) γ (c) ${}^1_0\text{n}$ (d) ${}^1_1\text{p}$
16. Which is not a fossil?
 (a) *Homo habilis* (b) *Homo sapiens*
 (c) *Homo erectus* (d) *Homo neanderthalensis*
17. Natural selection theory of C.R. Darwin was independently given by another scientist called :
 (a) Alfred Nobel (b) Alfred Wallace
 (c) T. Dobzhansky (d) S. Wright
18. Which is not true in human ?
 (a) XO is Turner's syndrome
 (b) XXY is Klinefelter's syndrome
 (c) XYY is super female
 (d) XXX is super female
19. Who among the following is not associated with origin of life?
 (a) A.I. Oparin (b) J.B.S. Haldane
 (c) Stanley Miller (d) Lord Zuckerman
20. Oxytocin is released from pituitary. It is
 (a) A protein (b) Octapeptide
 (c) Decapeptide (d) Bioamine
21. Which statement is wrong for humans ?
 (a) Fertilization is internal
 (b) Fertilization takes place in fallopian tube
 (c) Ovulation is followed by fertilization
 (d) Ovulation occurs prior to fertilization
22. Which of the following is a growth hormone of plants?
 (a) Somatostatin (b) Leptin
 (c) Gastrin (d) Auxin
23. Ascent of sap in plants takes place through
 (a) Sieve tubes (b) Phloem
 (c) Tracheids and vessels
 (d) All of the above
24. Pineal gland is located near
 (a) Hypothalamus (b) Thyroid gland
 (c) Adrenal gland (d) Pancreas
25. When are two inorganic phosphates used?
 (a) ADP to ATP (b) AMP to ADP
 (c) AMP to ATP (d) ATP to AMP
26. In which conversion is one inorganic phosphate released?
 (a) ATP to AMP (b) ADP to AMP
 (c) AMP to ADP (d) ADP to ATP
27. Which is not the correct scientific name of honeybee species?
 (a) *Apis indica* (b) *Apis dorsata*
 (c) *Apis craniata* (d) *Apis mellifera*
28. Which of the following aquatic animals are reared for obtaining pearls?
 (a) Mussels (b) Prawns
 (c) Mulletts (d) Oysters
29. Which of the following is an example of micronutrient needed by plants?
 (a) Sulphur (b) Magnesium
 (c) Manganese (d) Potassium
30. Peptic ulcer is caused by
 (a) *Trypanosoma gambiense*
 (b) *Helicobacter pylori*
 (c) *L. donovanae*
 (d) *S. typhimurium*
31. Famous book 'Systema Naturae' was written by the scientist
 (a) C.R. Darwin (b) Lamarck
 (c) G. J. Mendel (d) Carolus Linnaeus
32. Members of which phylum are first coelomate with segmented body?
 (a) Nematoda (b) Arthropoda
 (c) Mollusca (d) Annelida
33. Which of the following belongs to subkingdom phanerogamae?
 (a) Gymnosperms (b) Pteridophytes
 (c) Thallophytes (d) Bryophytes
34. Which distinguishes plant and animals cells? Tick the wrong option
 (a) Glycogen in animals
 (b) Starch in plants
 (c) Plastid in plants
 (d) Plastid in animals
35. Cell wall of the cork cells is impervious to gases and water due to deposition of
 (a) Cellulose and hemicellulose (b) Lignin
 (c) Suberin (d) Chitin

36. Roasting results in the production of metal in case of
 (a) Bauxite (b) Zinc blende
 (c) Cinnabar (d) Iron pyrite
37. Hydrogenation of vegetable oils is an example of
 (a) physical change (b) substitution reaction
 (c) addition reaction (d) decomposition reaction
38. Which sodium compound contains ten water molecules of crystallisation?
 (a) Baking soda (b) Washing soda
 (c) Common salt (d) Sodium hydroxide
39. The components of which one of the following mixtures can be separated by the process of filtration?
 (a) Suspension (b) Solution
 (c) Emulsion (d) Sol
40. Which is not a chemical change?
 (a) freezing of water (b) rusting of iron
 (c) burning of paper (d) digestion of food
41. Al_2O_3 is
 (a) acidic oxide (b) basic oxide
 (c) neutral oxide (d) amphoteric oxide
42. Which of the following compound is not in tetrahedral geometry?
 (a) CCl_4 (b) C_2H_4
 (c) CH_2Cl_2 (d) CH_4
43. Which of the following alkane obtain when sodium salt of propanoic acid is treated with soda-lime?
 (a) Methane (b) Ethane
 (c) Propane (d) Butane
44. Which of the following is acetone?
 (a) $\begin{array}{c} H & & H \\ | & & | \\ H-C & -C & -C-H \\ | & || & | \\ H & O & H \end{array}$ (b) $\begin{array}{c} H & H & O \\ | & | & || \\ H-C & -C & -C-H \\ | & | & \\ H & H & \end{array}$
 (c) $\begin{array}{c} O & H \\ || & | \\ H-C & -C-H \\ | & \\ H & \end{array}$ (d) $\begin{array}{c} H & H & H \\ | & | & | \\ H-C & -C & -C-H \\ | & | & | \\ H & OH & H \end{array}$
45. $2Pb(NO_3)_2(s) \xrightarrow{heat} 2PbO(s) + 4NO_2(g) + O_2(g)$
 The above reaction is an example of a
 (a) combination reaction
 (b) double displacement reaction
 (c) decomposition reaction
 (d) displacement reaction
46. Law of Octaves is applicable only upto
 (a) Br (b) Li (c) Ca (d) Sr
47. The formula of plaster of Paris is
 (a) $CaSO_4 \cdot 2H_2O$ (b) $CuSO_4 \cdot 5H_2O$
 (c) $(CaSO_4)_2 \cdot 2H_2O$ (d) $CaSO_4 \cdot \frac{1}{2}H_2O$
48. Among the following groups which is the Dobereiner's triad
 (a) Li, Na, K (b) N, P, As
- (c) F, Cl, Br (d) Cu, Ag, Au
49. Evaporation of liquid takes place
 (a) At its boiling point
 (b) Above its boiling point
 (c) Below its boiling point
 (d) Above and at its boiling point
50. What is the mass of 3.011×10^{23} molecules of nitrogen gas?
 (a) 2.8 g (b) 14 g (c) 28 g (d) 1.4 g
51. Which of the following is building free encyclopedias in most of the languages of the world?
 (a) Encyclopedia Britannica
 (b) Wikipedia
 (c) Global Heritage
 (d) World Book of Knowledge
52. Which of the following tower buildings is not located in U.A.E.?
 (a) Millennium Tower (b) Almas Tower
 (c) Burj Dubai (d) Aspire Tower
53. Who among the following women has not been a judge of the Supreme Court of India?
 (a) Fatima Beevi (b) Ruma Paul
 (c) Sujata Manohar (d) Lakshmi Srinath
54. The Chiang Mai Initiative is a currency pool of
 (a) Asean (b) Japan and South Korea
 (c) China (d) All of the above
55. 'Nurek', the world's highest dam is located in
 (a) China (b) Tajikistan
 (c) Japan (d) Colombia
56. Which of the following is not an agency of the United Nations?
 (a) International Court of Justice
 (b) Food and Agriculture Organisation
 (c) International Labour Organisation
 (d) International Maritime Organisation
57. Which of the following is not an Indian missile?
 (a) Agni (b) Dhanush
 (c) Prithvi (d) Srishti
58. Volkswagon is a car company from
 (a) Germany (b) Italy
 (c) France (d) U.K.
59. Sebastian Vettel is a
 (a) Cricketer (b) Formula-1 car racer
 (c) Boxer (d) Gymnast
60. How much of India's land is under actual forest cover?
 (a) About 22% (b) About 30%
 (c) About 40% (d) About 45%
61. The 'Zam Zam' water well is in
 (a) Madina (b) Makka
 (c) Kerbala (d) Baghdad
62. Which was the earliest mosque built in India?
 (a) Jama Masjid, Delhi
 (b) Moti Masjid, Agra

63. (c) Quwatul Islam Mosque, Delhi
(d) Noor Jahan Mosque, Kashmir
The calendar system of Indian Muslims is known as
(a) Sanwat (b) Hijri
(c) Shamsi (d) None
64. Muslims first settled down in India in the
(a) 6th century (b) 7th century
(c) 8th century (d) 9th century
65. In his poetry Mohammad Iqbal put forward the theory of
(a) Ishq-i-elahi (b) Khudi
(c) Wahdat-ul-Wajood (d) Fana Fillah
66. Mabdari movement of India was founded by
(a) Shah Abdul Aziz
(b) Shah Waliullah
(c) Syed Muhammad Jaunpuri
(d) Ahmad Raza Khan
67. The theory of "Wahdat-ul-Shuhud" was propounded by
(a) Shah Waliullah Dehlawi
(b) Allama Iqbal
(c) Sheikh Ahmad Sirhindi
(d) Syed Shaheed Ahmad Bareilavi
68. Babur's Tomb is situated in
(a) Agra (b) Delhi
(c) Kabul (d) Panipat
69. "Yadgar-i-Ghalib" is an important work, written by
(a) Altaf Hussain Hali (b) Allama Iqbal
(c) Mir Taqi Mir (d) Mirza Ghalib
70. Which of the following is correctly matched?
(a) Hauz Khas – Firoz Shah Tughluq
(b) Siri Fort – Altamash
(c) Qutub Minar – Muhammad Tughluq
(d) Tughlaqabad – Alaud-din Khalji
71. If the angles of a quadrilateral are in the ratio 3:5:9:13, then the angles of the quadrilateral are
(a) $36^\circ, 60^\circ, 108^\circ, 156^\circ$ (b) $35^\circ, 60^\circ, 110^\circ, 155^\circ$
(c) $45^\circ, 50^\circ, 120^\circ, 145^\circ$ (d) None of these
72. Which of the following cannot be the probability of an event?
(a) $2/3$ (b) 15% (c) -1.5 (d) 0.7
73. Area of a sector of angle p (in degrees) of a circle with radius R is
(a) $\frac{P}{360} \cdot 2\pi R$ (b) $\frac{P}{180} \cdot \pi R^2$
(c) $\frac{P}{720} \cdot 2\pi R^2$ (d) None of these
74. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial g(x), the quotient and remainder were $(x - 2)$ and $(-2x + 4)$ respectively, then the polynomial g(x) is equal to

- (a) $x^2 - x + 1$ (b) $x^2 + x + 1$
(c) $x^2 + x - 1$ (d) $x^2 - x - 1$

75. ABCD is a cyclic quadrilateral, then angles A, B, C and D are



- (a) $A=120^\circ, B=70^\circ, C=60^\circ, D=110^\circ$
(b) $A=70^\circ, B=120^\circ, C=110^\circ, D=60^\circ$
(c) $A=60^\circ, B=70^\circ, C=120^\circ, D=110^\circ$
(d) None of these

76. Water in a canal 6m wide and 1.5m deep, is flowing with a speed of 10km/h. How much area will it irrigate in 30 minutes, if 8cm of standing water is needed?

- (a) 5.625 hectares (b) 562.5 hectares
(c) 56.25 hectares (d) 5625 hectares

77. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms

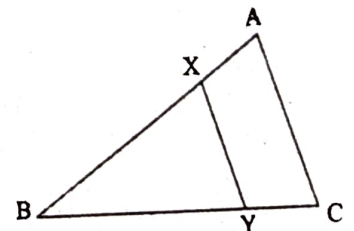
- (a) n^3 (b) $2n$ (c) 238 (d) n^2

78. If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = 1/\sqrt{3}$; $0^\circ < A+B \leq 90^\circ$; $A > B$, find A and B

- (a) $\angle A = 75^\circ, \angle B = 45^\circ$ (b) $\angle A = 45^\circ, \angle B = 15^\circ$
(c) $\angle A = 45^\circ, \angle B = 30^\circ$ (d) $\angle A = 60^\circ, \angle B = 30^\circ$

79. Sides of two similar triangles are in the ratio 4:9. Areas of these triangles are in the ratio
(a) 2:3 (b) 4:9 (c) 81:16 (d) 16:81

80. In the given figure, the line segment XY is parallel to side AC of $\triangle ABC$ and it divides the triangle into two parts of equal areas. Find the ratio AX/AB.



- (a) $\frac{2+\sqrt{2}}{2}$ (b) $\frac{2-\sqrt{3}}{2}$

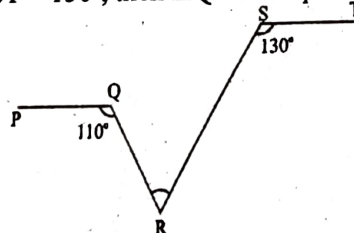
- (c) $\frac{2+\sqrt{3}}{2}$ (d) $\frac{2-\sqrt{2}}{2}$

81. In an equilateral triangle ABC, D is a point on side BC such that $BD = 1/3 BC$, then AD^2 is equal to:

- (a) $9/7 AB^2$ (b) $7/9 AB^2$
(c) $7 AB^2$ (d) $9 AB^2$

82. Find a relation between x and y if the points (x,y), (1,2) and (7,0) are collinear

- (a) $3x + y + 7 = 0$ (b) $x - 3y + 7 = 0$

- (c) $x - 3y - 7 = 0$ (d) $x + 3y - 7 = 0$
83. The coordinates of the points of trisection of the line segments joining (4, -1) and (-2, -3) are
 (a) $\left(-2, \frac{-5}{3}\right); \left(0, \frac{7}{3}\right)$ (b) $\left(2, \frac{-5}{3}\right); \left(0, \frac{-7}{3}\right)$
 (c) $\left(2, \frac{-7}{3}\right); \left(1, \frac{5}{3}\right)$ (d) $\left(2, \frac{-5}{3}\right); \left(-1, \frac{7}{3}\right)$
84. Let A (4,2), B(6,5) and C (1,4) be the vertices of ΔABC . The median from A meets BC at D. The coordinates of the point D are
 (a) $\left(\frac{9}{2}, \frac{3}{2}\right)$ (b) $\left(\frac{9}{2}, \frac{7}{2}\right)$
 (c) $\left(\frac{7}{2}, \frac{9}{2}\right)$ (d) $\left(\frac{-7}{2}, \frac{3}{2}\right)$
85. If the points A (6,1), B (8,2), C (9,4) and D(P, 3) are the vertices of a parallelogram, taken in order, find the value of P
 (a) 6 (b) 5 (c) 3 (d) 7
86. The following observations have been arranged in ascending order. If the median of the data is 63 find the value of x
 29, 32, 48, 50, x, x + 2, 72, 78, 84, 95
 (a) 64 (b) 62 (c) 63 (d) 65
87. Two concentric circles are of radii 5cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle.
 (a) 8 cm (b) 4 cm (c) 6 cm (d) 10 cm
88. From a point Q, the length of tangent of a circle is 24 cm and distance of Q from the centre is 25cm. The radius of the circle is
 (a) 4 cm (b) 5 cm (c) 6 cm (d) 7 cm
89. In the given figure if $\angle PQR = 110^\circ$, $\angle RST = 130^\circ$, then $\angle QRS$ is equal to
- 
- (a) 45° (b) 60° (c) 50° (d) 40°
90. If $\tan \theta = \frac{1}{\sqrt{7}}$, the value of $\frac{\operatorname{cosec}^2 \theta - \sec^2 \theta}{\operatorname{cosec}^2 \theta + \sec^2 \theta}$ is
 (a) $3/5$ (b) $3/7$ (c) $3/4$ (d) $3/8$
91. The angle of elevation of the top of a tower from two points at a distance of 4m and 9m from the base of the tower and in the same

- straight line with it are complementary. The height of the tower is-
 (a) 5 m (b) 6 m (c) 7 m (d) 8 m
92. The perimeter of a right triangle is 60 cm. Its hypotenuse is 25 cm, then area of the triangle is equal to
 (a) 300 cm^2 (b) 250 cm^2
 (c) 200 cm^2 (d) 150 cm^2
93. A train travels 360 km at a uniform speed. If the speed had been 5km/h more, it would have taken 1 hour less for the same journey. The speed of the train is-
 (a) 35 km/hour (b) 30 km/hour
 (c) 20 km/hour (d) 40 km/hour
94. Sonu went to a bank to withdraw Rs. 2000. He asked the cashier to give him Rs. 50 and Rs. 100 notes only. Sonu got 25 notes in all. The number of notes of Rs. 50 received by him are:
 (a) 8 (b) 12 (c) 10 (d) 15
95. The sum of the 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th terms is 44. The first three terms of the AP are
 (a) 13, 8, 3 (b) -13, -8, -3
 (c) -12, -7, -2 (d) 12, 7, 2
96. If $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$ then the value of $\cos \theta + \sin \theta$ is
 (a) $\sqrt{2} \tan \theta$ (b) $\sqrt{2} \cos \theta$
 (c) $\sqrt{2} \cot \theta$ (d) $\sqrt{2} \operatorname{cosec} \theta$
97. A solid sphere of radius 3cm is melted and then cast into small spherical balls each of diameter 0.6 cm. The number of balls thus obtained are
 (a) 100 (b) 500
 (c) 1000 (d) None of these
98. The radius and slant height of a cone are in the ratio of 4:7. If its curved surface area is 792 cm^2 , then its radius is equal to $\left(\text{use } \pi = \frac{22}{7}\right)$
 (a) 11 cm (b) 12 cm (c) 13 cm (d) 14 cm
99. The roots of a quadratic equation $(k - 12)x^2 + (k - 12)x + 2 = 0$ are equal, then values of k are:
 (a) $k = 12, k = 12$ (b) $k = 14, k = 14$
 (c) $k = 12, k = 14$ (d) $k = -12, k = -14$
100. Three coins are tossed. Probability of getting one head is:
 (a) $1/8$ (b) $1/3$ (c) $3/8$ (d) $1/2$

Answers 2010-2011

1.	a
2.	a
3.	c
4.	d
5.	a
6.	b
7.	d
8.	d
9.	d
10.	d
11.	b
12.	c
13.	d
14.	d
15.	c
16.	b
17.	b
18.	c
19.	d
20.	b
21.	c
22.	d
23.	c
24.	a
25.	c

26.	b
27.	c
28.	d
29.	c
30.	b
31.	d
32.	d
33.	a
34.	d
35.	c
36.	c
37.	c
38.	b
39.	a
40.	a
41.	d
42.	b
43.	b
44.	a
45.	c
46.	c
47.	d
48.	a
49.	c
50.	b

51.	b
52.	d
53.	d
54.	d
55.	b
56.	a
57.	d
58.	a
59.	b
60.	a
61.	b
62.	c
63.	b
64.	b
65.	b
66.	c
67.	c
68.	c
69.	a
70.	a
71.	a
72.	c
73.	c
74.	a
75.	a

76.	c
77.	d
78.	b
79.	d
80.	d
81.	b
82.	d
83.	b
84.	c
85.	d
86.	b
87.	a
88.	d
89.	b
90.	c
91.	b
92.	d
93.	d
94.	c
95.	b
96.	b
97.	c
98.	b
99.	b
100.	c