



PHYSICS OF SOLIDS

Each question has four possible answers, tick (✓) the correct answer:

1. Polymer solids are:
(a) Order solids (b) Disorder solids
(c) In b/w order and disorder (d) Neither type
2. Crystalline solids are:
(a) Order solid (b) Disorder solid
(c) In b/w order and disorder (d) All of above
3. Amorphous solids are:
(a) Order solid (b) Disorder solid
(c) In b/w order and disorder (d) None of the above
4. Amorphous solid are also called:
(a) Crystalline solid (b) Glassy solid
(c) Soft solid (d) Hard solid
5. Crystalline solid have:
(a) Definite melting point (b) Indefinite melting point
(c) In between (d) None of above
6. The solids are classified as:
(a) Polymeric (b) Amorphous
(c) Crystalline (d) All of above
7. Each atom in a crystalline vibrates about a fixed point with an amplitude that:
(a) Increases with rise in temperature (b) Decreases with rise in temperature
(c) Remains the same with rise in temperature (d) None of these
8. The transition from solid state to liquid state is actually from:
(a) Order to order (b) Disorder to order
(c) Order to disorder (d) None of these
9. The force which maintains the long-range order between atoms of crystalline solid is called:
(a) Gravitational force (b) Nuclear force
(c) Coulomb's force (d) Cohesive force
10. The word amorphous means:
(a) With definite structure (b) Without any structure
(c) Regular arrangement of atoms (d) None of these

11. An ordinary glass gradually softens into a paste like state before it becomes a very viscous liquid which is possible at:
- (a) 900°C (b) 600°C
(c) 800°C (d) 100°C
12. A unit cell is the smallest basic structure which is:
- (a) Two dimensional (b) One dimensional
(c) Three dimensional (d) None of these
13. The temperature at which the vibrations become so great that the structure of the crystal breaks is called:
- (a) Melting point (b) Critical temperature
(c) Boiling point (d) None of these
14. The whole structure obtained by the repetition of unit cell is called:
- (a) Crystalline solid (b) Amorphous solid
(c) Polymeric solid (d) Crystal lattice
15. Examples of polymeric solids are:
- (a) Plastic (b) Zirconia
(c) NaCl (d) Copper
16. Examples of crystalline solids are:
- (a) Copper (b) NaCl
(c) Zirconia (d) All of above
17. The substance which breaks after the elastic limit is called:
- (a) Brittle (b) Organic
(c) Ductile (d) All of above
18. Ordinary glass becomes a very viscous liquid at:
- (a) 600°C (b) 800°C
(c) 300°C (d) 100°C
19. Artificial polymers are made by a chemical reaction known as:
- (a) Polymerization (b) Polarization
(c) Electroplating (d) All of the above
20. Which of the following are mechanical properties of a material:
- (a) Ductility (b) Strength
(c) Stiffness (d) All of the above
21. The ratio of stress to strain is called:
- (a) Modulus of elasticity (b) Young's modulus
(c) Bulk modulus (d) All of the above

22. The ratio of applied stress to tensile strain is called:
(a) Bulk modulus (b) Young modulus
(c) Shear modulus (d) None of the above
23. The ratio of the applied stress to volume strain is called:
(a) Bulk modulus (b) Young modulus
(c) Shear modulus (d) None of the above
24. The ratio of the applied stress to shear strain is called:
(a) Bulk modulus (b) Young modulus
(c) Shear modulus (d) None of the above
25. The prosperity of a material to return to its original shape and size on the removal of strain is called:
(a) Elasticity (b) Strain
(c) Plasticity (d) None of the above
26. When a body is subjected to some external force, deformation is produced in:
(a) Shape (b) Length
(c) Volume (d) Any of these
27. The results of mechanical tests are usually expressed in terms of:
(a) Strain (b) Stress
(c) Applied force (d) All of above
28. When the stress changes length of a body, it is called:
(a) Tensile strain (b) Shear strain
(c) Volumetric strain (d) None of these
29. When the stress changes the shape of the body it is called:
(a) Tensile strain (b) Shear strain
(c) Volumetric strain (d) None of these
30. When the stress changes the volume of the body, it is called:
(a) Tensile strain (b) Shear strain
(c) Volumetric strain (d) None of these
31. A stress which decreases the length along one dimension is known as:
(a) Compressive stress (b) Tensile stress
(c) Linear stress (d) None of these
32. Bulk Modulus is involved when the deformation is:
(a) Two dimensional (b) Three dimensional
(c) One dimensional (d) None of these
33. For practical purposes, the proportional limit for ductile material is:
(a) Smaller than elastic limit (b) Greater than elastic limit
(c) Identical to the elastic limit (d) None of these

34. When the specimen does not recover its original shape after the stress is removed, its behaviour is called:
- (a) Ductility (b) Deformation
(c) Plasticity (d) Elasticity
35. Yield stress is another name of:
- (a) Plasticity (b) Proportional limit
(c) Elastic limit (d) Both (b) and (c)
36. The ultimate tensile strength (UTS) is the:
- (a) Maximum strength that a material can with stand
(b) Minimum strength
(c) Minimum strength that a material can withstand
(d) Both (a) and (c)
37. Once the stress is increased than UTS, the material falls into the region of:
- (a) Fracture stress (b) Elastic limit
(c) Proportional limit (d) None of these
38. A steel wire 20 mm in diameter is stretched by a force of 113 N. The tensile stress applied is:
- (a) 1 MPa (b) 10^{-6} N/m²
(c) 0.1 MPa (d) 0.2×10^6 Pa
39. The area method for finding strain energy is useful for:
- (a) Linear part (b) Non-elastic part
(c) Linear part of the force-extension graph (d) None of these
40. The strain energy in a deformed wire is actually the gain in the:
- (a) Kinetic energy of its molecules (b) Potential energy of its molecules
(c) K.E and P.E of the its molecules (d) Gravitational P.E of its molecules
41. The force applied on a unit area to produce any change in shape, volume and length is called:
- (a) Stress (b) Strain
(c) Elasticity (d) Plasticity
42. Hook's law states that the strain is directly proportional to:
- (a) Power (b) Shear
(c) Force (d) Energy
43. Molecules of a solid possess:
- (a) Rotatory motion (b) Vibratory motion
(c) Circular motion (d) Translatory motion
44. Force applied on a unit area is called:
- (a) Strain (b) Stress
(c) Elasticity (d) Fracture strain

45. The SI unit of stress is:
(a) N-S (b) N-m^{-2}
(c) N-m (d) N
46. A stress which changes one dimension only is:
(a) Linear strain (b) Linear stress
(c) Elasticity (d) None of the above
47. The dimension of stress is:
(a) $[\text{MLT}^{-1}]$ (b) $[\text{ML}^{-1}\text{T}]$
(c) $[\text{ML}^{-1}\text{T}^{-1}]$ (d) $[\text{ML}^{-1}\text{T}^{-2}]$
48. The dimension of strain is:
(a) $[\text{L}]$ (b) $[\text{LT}^{-1}]$
(c) $[\text{L}^{-1}]$ (d) Dimension less
49. The maximum stress which a body can bear is:
(a) Plastic stress (b) Elastic stress
(c) UTS (d) None of the above
50. Mathematically stress can be expressed as:
(a) $E = \frac{F}{A}$ (b) $\sigma = \frac{F}{A}$
(c) $\gamma = \frac{\Delta a}{a}$ (d) None of the above
51. The extension produced in a sample of material depends upon:
(a) Area (b) Force
(c) Nature of material (d) All of the above
52. Mathematically the tensile strain can be expressed as:
(a) $\epsilon = \frac{\Delta l}{l}$ (b) $\sigma = F/A$
(c) $\gamma = \frac{\Delta a}{a}$ (d) None of the above
53. If ΔV be the change in volume and V is the original volume, the volume strain is given by:
(a) $\frac{\Delta V}{V}$ (b) $\frac{V}{\Delta V}$
(c) ΔV (d) None of the above
54. If Δl is the change in length and l is the original length then tensile strain can be expressed as:
(a) $\epsilon = l \cdot \Delta l$ (b) $\epsilon = \frac{\Delta l}{l}$
(c) $\epsilon = \frac{l}{\Delta l}$ (d) None of these

55. A solid that is intermediate between order and disorder is called:
(a) Polymeric solids (b) Glassy solid
(c) Amorphous solids (d) None of these
56. Materials have specific uses depending upon their characteristics and properties such as:
(a) Hardness (b) Conducting or magnetic
(c) Ductility (d) All of above
57. Example of polymeric solid:
(a) Polythene (b) Plastic
(c) Nylon (d) All of above
58. Whole structure of solid obtain by the repetition of unit cells is called:
(a) Polymer (b) Crystal lattice
(c) Amorphous (d) None of these
59. Measure of deformation of body with application of stress is called:
(a) Rigidity (b) Modulus of elasticity
(c) Elasticity (d) Strain
60. Bulk modulus of elasticity is given by:
(a) $E = \frac{F/A}{\frac{\Delta l}{l}}$ (b) $K = \frac{F/A}{\frac{\Delta V}{V}}$
(c) $G = \frac{F/A}{\tan \theta}$ (d) F/A
61. Solids with high value of conductivity are called:
(a) Conductors (b) Semi-conductors
(c) Insulators (d) Plasticity
62. Any change produced in shape, volume or length when a body is subjected some external force is called:
(a) Yield point (b) Elastic limit
(c) Deformation (d) Plasticity
63. Modulus of elasticity of material is:
(a) $\frac{\text{Stress}}{\text{Strain}}$ (b) $\frac{\text{Strain}}{\text{Stress}}$
(c) $\text{Stress} \times \text{Strain}$ (d) None of these
64. The value of stress beyond which the body is permanently deformed is called:
(a) Mini-stress (b) Yield stress
(c) Maxi-stress (d) None of these
65. The conductors having the conductivity of the order of:
(a) $10^{-4} (\Omega - m)^{-1}$ (b) $10^7 (\Omega m)^{-1}$
(c) $10^{-10} (\Omega - m)^{-1}$ (d) $10^{-7} (\Omega - m)^{-1}$

66. Insulators have the conductivity of the order of:
- (a) $10^7 (\Omega \text{ m})^{-1}$ (b) $10^{-6} (\Omega \text{ m})^{-1}$
(c) $10^{-20} (\Omega \text{ m})^{-1}$ (d) $10^{-4} (\Omega \text{ m})^{-1}$
67. The substances which have partially filled conduction bands are called:
- (a) Conductors (b) Insulator
(c) Semi-conductor (d) Super Conductor
68. A conduction band is always:
- (a) Partially filled (b) Complete filled
(c) Partially empty (d) Empty
69. The conduction band lies:
- (a) Inside the valance band (b) Below valance band
(c) Above valance band (d) None of these
70. The electrons occupying by conduction band are:
- (a) Free electrons (b) Valance electrons
(c) Conductive electrons (d) All of above
71. The band below the valance band is:
- (a) Empty band (b) Partially filled band
(c) Completely filled band (d) All of above
72. The theory failed to explain the complete electric behaviour of solid:
- (a) Rutherford's theory (b) Newton's theory
(c) Bohr's theory (d) None of the above
73. The examples of conductors are:
- (a) Copper (b) Diamond
(c) Wood (d) Germinium
74. The examples of insulators are:
- (a) Diamond (b) Wood
(c) Zinc (d) Both (a) and (b)
75. Valence band:
- (a) Contains valence electron (b) Contains no valence electron
(c) Highest occupied band (d) Lowest occupied band
76. Valence band may be:
- (a) Completely filled (b) Partially filled
(c) Both (a) and (b) (d) None of these
77. Conduction band may be:
- (a) Partially filled with electrons (b) Empty
(c) Not empty (d) None of these

78. Those materials in which valence and conduction bands are overlap each other are called:
- (a) Conductors (b) Insulators
(c) Semi-conductors (d) None of these
79. Partially filled conduction and valence bands with a very narrow forbidden energy gap in between them shows the:
- (a) Conductors (b) Insulators
(c) Semi-conductors (d) None of these
80. When a battery is connected to a semi-conductor, the current passes through it is due to:
- (a) Electrons and holes (b) Protons and holes
(c) Electrons (d) Holes
81. On introducing a small amount of impurity into a pure semi-conductor, its electrical behaviour:
- (a) does not change (b) is changed
(c) is changed very small (d) is changed very large
82. To form an N-type semi-conductor, silicon crystal is doped with:
- (a) Penta valent element (b) Trivalent element
(c) Both (a) and (b) (d) None of these
83. An example of donor impurity is:
- (a) Phosphorus (b) Indium
(c) Boron (d) Gallium
84. To form a P-type semi-conductor, silicon is doped with:
- (a) Germanium (b) Arsenic
(c) Indium (d) Antimony
85. An example of acceptor impurity is:
- (a) Phosphorus (b) Indium
(c) Arsenic (d) Silicon
86. An P-type substance is:
- (a) Neutral (b) Positively charged
(c) Negatively charged (d) None of these
87. An N-type substance is:
- (a) Neutral (b) Positively charged
(c) Negatively charged (d) None of these
88. Conductors have:
- (a) Partially filled valance band (b) Partially filled conduction band
(c) Narrow forbidden gap (d) All of above
89. The doped semi-conducting materials are called:
- (a) Superconductors (b) Poor semi conductors
(c) Pure semi conductors (d) Extrinsic semi conductors

90. When a Germanium is doped with pentavalent impurity, the doped semi conductor is:
(a) p-type (b) n-type
(c) Both (a) and (b) (d) None of the above
91. When a covalent bond is broken in a doped semi conductor:
(a) An electron is created (b) A proton and electron are created
(c) A hole is created (d) A pair of hole and electron are created
92. The material whose resistivity becomes zero below a certain temperature:
(a) Conductors (b) Semi conductors
(c) Super conductors (d) Insulators
93. The energy band occupying valance electrons is known as:
(a) Conductive electrons (b) Valance electrons
(c) Free electrons (d) Both (a) and (c)
94. The energy band occupying free electrons is called:
(a) Conduction band (b) Valance band
(c) Forbidden gap (d) None of these
95. An example of an intrinsic semi conductor is:
(a) Al (b) Ge
(c) Cb (d) Ph
96. An example of an extrinsic semi conductor is:
(a) Si (b) ph
(c) Al (d) Both (b) and (c)
97. The super conductor was discovered by:
(a) Lenz (b) Orested
(c) Kmaerlingh ornes (d) Faraday
98. The first super conductor was discovered in:
(a) 1923 (b) 1917
(c) 1905 (d) 1911
99. The resistance of mercury becomes zero at the temperature:
(a) Below 4.2 K (b) to 4.2 K
(c) Above 4.2 K (d) None of these
100. A new class of ceramic materials was discovered in:
(a) 1986 (b) 1978
(c) 1938 (d) 1958
101. Lead becomes super conductor at temperature:
(a) 12.66 K (b) 7.2 K
(c) 3.0 K (d) 2.5 K

102. Super conductors are used in:
- (a) Magnetic Levitation train
 - (b) Fast computer chip
 - (c) Magnetic resonance imaging
 - (d) All of the above
103. Semi conductor is one which has:
- (a) Large conductivity
 - (b) Less conductivity
 - (c) Zero conductivity
 - (d) Intermediate conductivity
104. On doping, the conductivity of the semi conductor:
- (a) Remains constant
 - (b) Increases
 - (c) Decreases
 - (d) None of the above
105. What type of impurity is to be added to the semi conductor material to provide hole:
- (a) Pentavalent
 - (b) Trivalent
 - (c) Monovalent
 - (d) None of these
106. A p-type material is:
- (a) Negatively charged
 - (b) Positive charged
 - (c) Neutral
 - (d) None of these
107. A metallic conductors conduct electricity because they have large number of free:
- (a) Ions
 - (b) Electrons
 - (c) Protons
 - (d) Dipoles
108. A n-type material is:
- (a) Negatively charged
 - (b) Positively charged
 - (c) Both (a) and (b)
 - (d) Neutral
109. Semi conductors have electrical conductivities which:
- (a) Are high at ordinary temperature
 - (b) Increase with temperature
 - (c) Decrease with temperature
 - (d) None of these
110. A hole in p-type semi conductor is:
- (a) Deficiency of electron
 - (b) Excess of electron
 - (c) A missing proton
 - (d) None of these
111. In a semi conductor, the mobility of holes is:
- (a) Equal to electrons
 - (b) Less than electrons
 - (c) Greater than electrons
 - (d) None of these
112. In semi conductor, the holes and electrons move in:
- (a) Opposite direction
 - (b) Same direction
 - (c) Perpendicular to each other
 - (d) None of these
113. A trivalent impurity is usually called:
- (a) Donar
 - (b) Acceptor
 - (c) Transistor
 - (d) Transformer

114. Recently a complex crystalline structure known as yttrium barium copper oxide ($\text{Yba}_2 \text{Cu}_3 \text{O}_3$) have reported to become super conductor at:
- (a) 163 K (b) 169 K
(c) 200 K (d) 100 K
115. Substances whose atoms are magnetic dipole are called:
- (a) Diamagnetic substance (b) Ferromagnetic substance
(c) Paramagnetic substance (d) All of these
116. An atom having resultant magnetic field:
- (a) behaves like a tiny magnet (b) is called magnetic dipole
(c) is called diamagnetic (d) all of above
117. Magnetic field produced by spinning nucleus is:
- (a) much weaker (b) is the same
(c) much stronger (d) none of these
118. The term domain refers mainly to:
- (a) Paramagnetic substance (b) Diamagnetic substances
(c) Ferromagnetic substances (d) None of these
119. An electromagnet is the combination of solenoid and a specimen of:
- (a) Steel inside it (b) Iron inside it
(c) Iron outside it (d) Wood inside it
120. Soft magnetic materials are used for making:
- (a) Permanent magnets (b) Electromagnets
(c) Both (a) and (b) (d) None of these
121. Curie temperature is:
- (a) Different for chromium oxide and cobalt (b) Same for chromium oxide and cobalt
(c) Same for iron and cobalt (d) None of these
122. Substances whose atoms do not form magnetic dipole are:
- (a) Ferromagnetic (b) Paramagnetic
(c) Diamagnetic (d) All of these
123. Iron is a magnetic material:
- (a) Soft (b) Hard
(c) Both (c) and (b) (d) None of these
124. The steel makes a good permanent magnet and is called:
- (a) soft (b) hard
(c) in between (d) None of these
125. Ferromagnetic substance have the small regions are called:
- (a) Magnets (b) Patches
(c) Domains (d) None of these

126. The curie temp for iron is about:
(a) 800°C (b) 740°C
(c) 750°C (d) 650°C
127. The process of introduces a small amount of impurity into the pure semi conductor is called:
(a) Overlapping (b) Mixing
(c) Doping (d) None of these
128. Which of the following are example of diamagnetic substances:
(a) Antimony (b) Cobalt
(c) Copper (d) Both (a) and (c)
129. Which of the following is not a ferromagnetic substances:
(a) Copper (b) Steel
(c) Iron (d) Cobalt
130. The permeability of diamagnetic materials:
(a) Less than one (b) Greater than one
(c) Equal to one (d) Zero
131. The temp at which a ferromagnetic disappear, the substance becomes paramagnetic is known as:
(a) Critical temperature (b) Curie temperature
(c) Absolute temperature (d) All of above
132. The area of hysteresis loop is proportional to the work done in:
(a) Magnetizing of the substance (b) Reversing the magnetic field
(c) Demagnetizing the substance (d) None of these
133. If a material sets up a magnetic field which opposes the applied magnetic field it is said to be:
(a) Electromagnetic (b) Diamagnetic
(c) Paramagnetic (d) None of these
134. ♀ The domain theory of magnet is important to explain the behaviour of:
(a) Diamagnets (b) Paramagnets
(c) Ferromagnets (d) All of these
135. ♀ A pentavalent impurity in Si:
(a) a free electron and a free hole (b) a free hole
(c) a free electron (d) No free particle
136. Unit of specific gravity:
(a) m/s^2 (b) No unit
(c) kg/m^3 (d) J/m^3
137. Unit of Bulk modulus is:
(a) No unit (b) N/m^2
(c) N/P_a (d) $\text{P}_a(\text{m})$

138. Formula for strain energy in deformed materials is:

(a) $\frac{1}{2} \frac{EA l_1^2}{L}$

(b) $\frac{EA l_1^2}{2}$

(c) $\frac{1}{3} \frac{EA l_1}{L}$

(d) $\frac{1}{2} \frac{EA l_1}{L^2}$

139. At 0 K a piece of silicon is a:

(a) Conductor

(b) Semi-conductor

(c) Insulator

(d) All

140. Gallium belongs to _____ group.

(a) 4th

(b) 2nd

(c) 7th

(d) 3rd

141. Polythene, polystyrene and nylon etc., are examples of:

(a) Crystalline

(b) Amorphous

(c) Polymers

(d) None of these

142. Polymers have _____ specific gravity compared with even the lightest of metals.

(a) High

(b) Low

(c) Zero

(d) None of these

143. The strength to weight ratio of plastic material (chair) is _____ then steel material (chair).

(a) Greater

(b) Lesser

(c) Same

(d) None of these

144. There are _____ different crystal systems based as the geometrical arrangement of their atoms and the material breaks at a point, responding the _____.

(a) 2

(b) 7

(c) 3

(d) 5

145. Coercive force is used to:

(a) Demagnetize the material

(b) Magnetize the material

(c) Extend it

(d) None of these

146. Net charge on n-type material is:

(a) Positive

(b) Negative

(c) Neutral

(d) All

147. Energy needed to magnetize and demagnetize is given by:

(a) Hysteresis curve

(b) Area of loop

(c) Coercivity

(d) None of these

148. Yttrium barium copper oxide ($\text{YBa}_2\text{Cu}_3\text{O}_7$) become superconductor at:

(a) 163 K

(b) -110°C

(c) Both (a), (b)

(d) None of these

149. Which of following has the highest elasticity?
- (a) Rubber (b) Steel
(c) Glass (d) All
150. Which of the following has bulk modulus?
- (a) Water (b) Gas
(c) Honey (d) All
151. The power dissipated in a resistor is the same for a constant potential difference V as for a sinusoidal potential difference with peak value V_0 . Which of the following is the correct relationship between V and V_0 ?
- (a) $V_0 = \frac{V}{2}$ (b) $V_0 = \frac{V}{\sqrt{2}}$
(c) $V_0 = V$ (d) $V_0 = \sqrt{2}V$
152. A sinusoidal alternating current of peak value I_0 passes through a heater of resistance R . What is the mean power output of the heater?
- (a) $\frac{I_0^2 R}{2}$ (b) $\frac{I_0^2 R}{\sqrt{2}}$
(c) $I_0^2 R$ (d) $\sqrt{2} I_0^2 R$
153. An alternating current I/A varies with time t/s according to the equation.
$$I = 5\sin(100\pi t)$$

What is the mean power developed by the current in a resistive load of resistance 10Ω ?
- (a) 125W (b) 160W
(c) 250W (d) 500W
154. An alternating current of root-mean-square value 2A in a given resistor dissipates energy at the same rate as a steady direct current I in another resistor of the same value. What is the value of I ?
- (a) $\sqrt{2}$ A (b) 2A
(c) $2\sqrt{2}$ A (d) 4A

ANSWERS

1.	(c)	2.	(a)	3.	(b)	4.	(b)	5.	(a)
6.	(d)	7.	(a)	8.	(c)	9.	(d)	10.	(b)
11.	(c)	12.	(c)	13.	(a)	14.	(d)	15.	(a)
16.	(d)	17.	(a)	18.	(b)	19.	(a)	20.	(d)
21.	(a)	22.	(b)	23.	(a)	24.	(c)	25.	(a)
26.	(d)	27.	(d)	28.	(a)	29.	(b)	30.	(c)
31.	(c)	32.	(b)	33.	(c)	34.	(c)	35.	(c)
36.	(a)	37.	(a)	38.	(a)	39.	(c)	40.	(b)
41.	(a)	42.	(c)	43.	(b)	44.	(b)	45.	(b)
46.	(b)	47.	(d)	48.	(d)	49.	(c)	50.	(b)
51.	(d)	52.	(a)	53.	(a)	54.	(b)	55.	(a)
56.	(d)	57.	(d)	58.	(b)	59.	(d)	60.	(b)
61.	(a)	62.	(c)	63.	(a)	64.	(b)	65.	(b)
66.	(c)	67.	(a)	68.	(a)	69.	(c)	70.	(d)
71.	(c)	72.	(c)	73.	(a)	74.	(d)	75.	(a)
76.	(c)	77.	(a)	78.	(a)	79.	(c)	80.	(a)
81.	(b)	82.	(a)	83.	(a)	84.	(c)	85.	(b)
86.	(a)	87.	(a)	88.	(d)	89.	(d)	90.	(b)
91.	(d)	92.	(c)	93.	(d)	94.	(b)	95.	(b)
96.	(d)	97.	(c)	98.	(d)	99.	(a)	100.	(a)
101.	(b)	102.	(d)	103.	(d)	104.	(b)	105.	(b)
106.	(c)	107.	(b)	108.	(d)	109.	(b)	110.	(a)
111.	(b)	112.	(a)	113.	(b)	114.	(a)	115.	(c)
116.	(d)	117.	(a)	118.	(c)	119.	(b)	120.	(c)
121.	(a)	122.	(c)	123.	(a)	124.	(b)	125.	(c)
126.	(c)	127.	(c)	128.	(d)	129.	(a)	130.	(a)
131.	(b)	132.	(d)	133.	(b)	134.	(c)	135.	(c)
136.	(b)	137.	(b)	138.	(a)	139.	(b)	140.	(d)
141.	(c)	142.	(b)	143.	(a)	144.	(b)	145.	(a)
146.	(c)	147.	(b)	148.	(c)	149.	(b)	150.	(b)
151.	(d)	152.	(a)	153.	(a)	154.	(c)		