<u>INSTRUCTION</u> : Read questions carefully. Each question contains 4 marks. For every wrong answer 1 mark will be deducted . You can skip 5 questions from PART-I, 5 questions from PART-II, and 10 questions from PART-III

PART-I

1. The potential difference applied to an X-ray tube is 5 KV and the current through it is 3.2 mA. Then the number of electrons striking the target per second is
   (a) 2×10^{16} (b) 5×10^6
   (c) 1×10^{17} (d) 4×10^{15}

2. An electron is moving in a circular path of radius 5.1×10^{-11} m at a frequency of 6.8×10^{15} revolution/sec. The equivalent current is approximately
   (a) 5.1×10^{-3} A   (b) 6.8×10^{-3} A
   (c) 1.1×10^{-3} A   (d) 2.2×10^{-3} A

3. A conducting wire of cross-sectional area 1 cm2 has 3×10^{23} m^{-3} charge carriers. If wire carries a current of 24 mA, the drift speed of the carrier is
   (a) 5×10^{-6} m/s   (b) 5×10^{-3} m/s
   (c) 0.5 m/s   (d) 5×10^{-2} m/s

4. A current flows in a wire of circular cross-section with the free electrons travelling with a mean drift velocity v. If an equal current flows in a wire of twice the radius new mean drift velocity is
   (a) v   (b) $\frac{v}{2}$
   (c) $\frac{v}{4}$ (d) None of these

5. Two wires of resistance R_1 and R_2 have temperature co-efficient of resistance a_1 and a_2 respectively. These are joined in series. The effective temperature co-efficient of resistance is
   (a) $\frac{a_1+a_2}{2}$ (b) $\sqrt{a_1 + a_2}$
   (c) $\frac{a_1 R_1 + a_2 R_2}{R_1 + R_2}$ (d) $\frac{R_1 R_2 a_1 a_2}{R_1^2 + R_2^2}$

6. From the graph between current i & voltage V shown, identity the portion corresponding to negative resistance


   (a) DE   (b) CD
   (c) BC   (d) AB
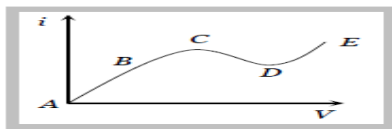
7. A wire of length L and resistance R is streched to get the radius of cross-section halfed. What is new Resistance
   (a) 5 R   (b) 8 R
   (c) 4 R   (d) 16 R

8. The resistance of a wire at 20°C is 20 Ω and at 500°C is 60 Ω. At which temperature resistance will be 25 Ω
   (a) 50°C   (b) 60°C
   (c) 70°C   (d) 80°C

9. The specific resistance of manganin is 50×10^{-8} Ω m. The resistance of a manganin cube having length 50 cm is
   (a) 10^{-6} Ω   (b) 2.5×10^{-5} Ω
   (c) 10^{-8} Ω   (d) 5×10^{-4} Ω

10. An aluminium rod of length 3.14 m is of square cross-section 3.14×3.14 mm^2. What should be the radius of 1 m long another rod of same material to have equal resistance
    (a) 2 mm   (b) 4 mm
    (c) 1 mm   (d) 6 mm

11. If a copper wire is stretched to make it 0.1% longer, the percentage increase in resistance will be
    (a) 0.2   (b) 2
    (c) 1   (d) 0.1

12. The temperature co-efficient of resistance of a wire is 0.00125/°C. At 300 K. It's resistance is 1 Ω. The resistance of the wire will be 2 Ω at
    (a) 1154 K   (b) 1127 K
    (c) 600 K   (d) 1400 K

13. Dimensions of a block are 1 cm $\times$1 cm $\times$ 100 cm. If specific resistance of its material is 3×10^{-7} ohm-m, then the resistance between it's opposite rectangular faces is
    (a) 3×10^{-9} ohm   (b) 3×10^{-7} ohm
    (c) 3×10^{-5} ohm   (d) 3×10^{-3} ohm

14. Two rods A and B of same material and length have their electric resistances are in ratio 1 : 2. When both the rods are dipped in water, the correct statement will be
    (a) A has more loss of weight
    (b) B has more loss of weight
    (c) Both have same loss of weight
    (d) Loss of weight will be in the ratio 1

15. What is the resistance of a carbon resistance which has bands of colours brown, black and brown
    (a) 100 Ω.   (b) 1000 Ω.
    (c) 10 Ω.   (d) 1 Ω.

16. An electric cable contains a single copper wire of radius 9 mm. It's resistance is 5 Ω. This cable is replaced by six insulated copper wires, each of radius 3 mm. The resultant resistance of cable will be
    (a) 7.5 Ω   (b) 45 Ω
    (c) 90 Ω   (d) 270 Ω

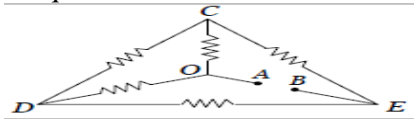17. Five resistances are combined according to the figure. The equivalent resistance between the point X and Y will be

(a) 10 Ω   (b) 22 Ω
(c) 20 Ω   (d) 50 Ω
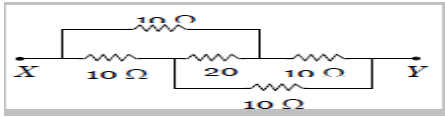
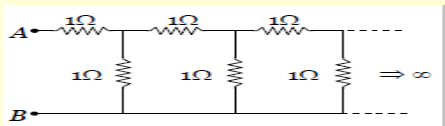18. What will be the equivalent resistance of circuit shown in figure between points A and D

(a) 10 Ω   (b) 20 Ω
(c) 30 Ω   (d) 40 Ω
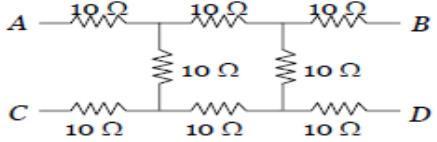
19. In the network shown in the figure each of resistance is equal to 2 Ω The resistance between A and B is

(a) 1 Ω   (b) 2 Ω
(c) 3 Ω   (d) 4 Ω

20. The equivalent resistance between points A and B of an infinite network of resistance, each of 1 Ω, connected as shown is
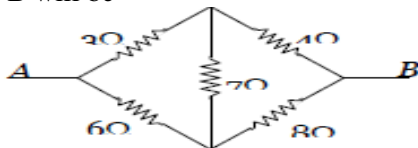

(a) Infinite   (b) 2 Ω
(c) $\frac{1+\sqrt5}{2}$ Ω   (d) Zero

21. BC, CD and DA respectively. Another resistance of 10 Ω is connected across the diagonal AC. The equivalent resistance between A & B is
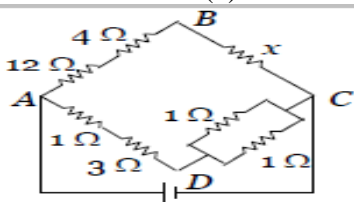(a) 2 Ω   (b) 5 Ω
(c) 7 Ω   (d) 10 Ω

22. In the given figure, equivalent resistance between A and B will be

(a) $\frac{14}{3}$ Ω   (b) $\frac{3}{14}$ Ω
(c) $\frac{9}{14}$ Ω   (d) $\frac{14}{9}$ Ω

23. In the combination of resistances shown in the figure the potential difference between B and D is zero, when unknown resistance (x) is

(a) 4 Ω
(b) 2 Ω
(c) 3 Ω
(d) The emf of the cell is required

24. A current of 2 A flows in a system of conductors as shown. The potential difference ($V_A - V_B$) will be
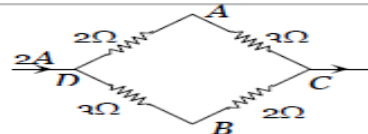
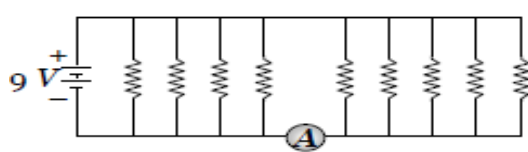(a) + 2V   (b) + 1V
(c) – 1 V   (d) – 2 V

25. Three resistances each of 4 Ω are connected in the form of an equilateral triangle. The effective resistance between two corners is
(a) 8 Ω   (b) 12 Ω
(c) $\frac{3}{8}$ Ω   (d) $\frac{8}{3}$ Ω

26. If each resistance in the figure is of 9 Ω then reading of ammeter is

(a) 5 A   (b) 8 A
(c) 2 A   (d) 9 A

27. A wire has resistance 12 Ω. It is bent in the form of a circle. The effective resistance between the two points on any diameter is equal to
(a) 12 Ω   (b) 6 Ω
(c) 3 Ω   (d) 24 Ω

28. A wire of resistance 0.5 Ω m–1 is bent into a circle of radius 1 m. The same wire is connected across a diameter AB as shown in fig. The equivalent resistance is
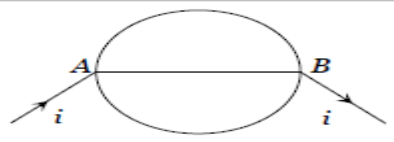
(a) π ohm   (b) π (π + 2) ohm
(c) π / (π + 4) ohm   (d) (π + 1) ohm

29. If in the given figure i = 0.25 amp, then the value R will be

(a) 48 Ω   (b) 12 Ω
(c) 120 Ω   (d) 42 Ω
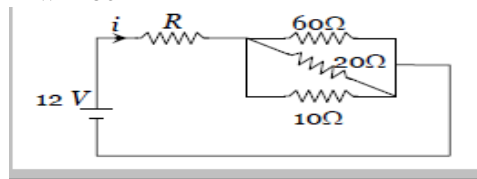
30. Two uniform wires A and B are of the same metal and have equal masses. The radius of wire A is twice that of wire B. The total resistance of A and B when connected in parallel is
(a) 4 Ω when the resistance of wire A is 4.25 Ω
(b) 5 Ω when the resistance of wire A is 4 Ω
(c) 4 Ω when the resistance of wire B is 4.25 Ω
(d) 5 Ω when the resistance of wire B is 4 Ω

31. A new flashlight cell of emf 1.5 volts gives a current of 15 amps, when connected directly to an ammeter of resistance 0.04 Ω. The internal resistance of cell is

(a) 0.04 Ω   (b) 0.06 Ω
(c) 0.10 Ω   (d) 10 Ω

32. For a cell, the terminal potential difference is 2.2 V when the circuit is open and reduces to 1.8 V, when the cell is connected across a resistance, R = 5 Ω. The internal resistance of the cell is

(a) $\frac{10}{9}$ Ω   (b) $\frac{9}{10}$ Ω
(c) $\frac{11}{9}$ Ω   (d) $\frac{5}{9}$ Ω

33. The internal resistance of a cell of emf 2V is 0.1 Ω. It's connected to a resistance of 3.9 Ω. The voltage across the cell will be

(a) 0.5 volt   (b) 1.9 volt
(c) 1.95 volt   (d) 2 volt

34. When the resistance of 2 Ω is connected across the terminal of the cell, the current is 0.5 amp. When the resistance is increased to 5 Ω, the current is 0.25 amp. The emf of the cell is

(a) 1.0 volt   (b) 1.5 volt
(c) 2.0 volt   (d) 2.5 volt

35. A primary cell has an emf of 1.5 volts, when short-circuited it gives a current of 3 amperes. The internal resistance of the cell is

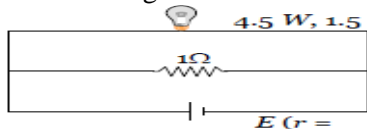(a) 4.5 ohm   (b) 2 ohm
(c) 0.5 ohm   (d) 1/4.5 ohm

36. A battery of internal resistance 4 Ω is connected to the network of resistances as shown. In order to give the maximum power to the network, the value of R (in Ω) should be
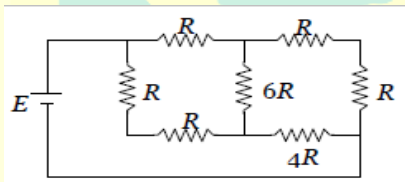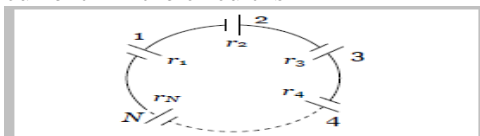

(a) 4/9   (b) 8/9
(c) 2   (d) 18

37. A torch bulb rated as 4.5 W, 1.5 V is connected as shown in the figure. The emf of the cell needed to make the bulb glow at full intensity is


(a) 4.5 V   (b) 1.5 V
(c) 2.67 V   (d) 13.5 V

38. A group of N cells whose emf varies directly with the internal resistance as per the equation $EN = 1.5 rN$ are connected as shown in the following figure. The current i in the circuit is

(a) 0.51 amp   (b) 5.1 amp
(c) 0.15 amp   (d) 1.5 amp

39. Two batteries A and B each of emf 2 volt are connected in series to external resistance R = 1 Ω. Internal resistance of A is 1.9 Ω and that of B is 0.9 Ω, what is the potential difference between the terminals of battery A
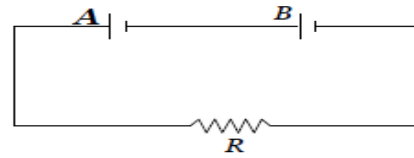
(a) 2 V   (b) 3.8 V
(c) 0   (d) None of these

40. In a mixed grouping of identical cells 5 rows are connected in parallel by each row contains 10 cell. This combination send a current i through an external resistance of 20 Ω. If the emf and internal resistance of each cell is 1.5 volt and 1 Ω respectively then the value of i is

(a) 0.14   (b) 0.25
(c) 0.75   (d) 0.68

41. In the adjoining circuit, the battery E_1 has as of 12 volt and zero internal resistance, while the battery E has an emf of 2 volt. If the galvanometer reads zero, then the value of resistance X ohm is

(a) 10   (b) 100
(c) 500 emf   (d) 200

42. The magnitude and direction of the current in the circuit shown will be
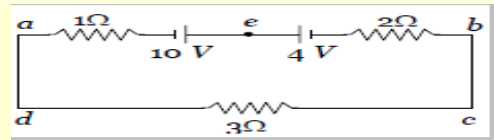
(a) $\frac{7}{3}$ A from a to b through e
(b) $\frac{7}{3}$ A from b and a through e
(c) 1.0 A from b to a through e
(d) 1.0 A from a to b through e

43. Figure represents a part of the closed circuit. The potential difference between points A and B ($V_A - V_B$) is
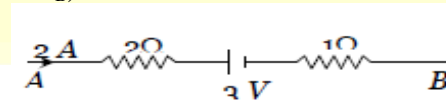
(a) + 9 V   (b) – 9 V
(c) + 3 V   (d) + 6 V

44. In the circuit shown below the cells E_1 and E_2 have emf's 4 V and 8 V and internal resistance 0.5 ohm and 1 ohm respectively. Then the potential difference across cell E_1 and E_2 will be
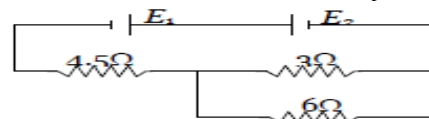
(a) 3.75 V, 7.5 V   (b) 4.25 V, 7.5 V
(c) 3.75 V, 3.5 V   (d) 4.25 V, 4.25 V

45. A wire of length L and 3 identical cells of negligible internal resistances are connected in series. Due to this current, the temperature of the wire is raised by ΔT in time t. A number N of similar cells is now connected in series with a wire of the same material and cross-section but of length 2L. The temperature of wire is raised by same amount ΔT in the same time t. The value of N is

(a) 4   (b) 6
(c) 8   (d) 9

46. In the following circuit $E_1 = 4V$, $R_1 = 2\ \Omega$
    $E_2 = 6V$, $R_2 = 2\ \Omega$ and $R_3 = 4\ \Omega$ The current i_1 is
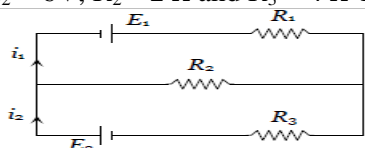
    (a) 1.6 A   (b) 1.8 A
    (c) 2.25 A   (d) 1 A

47. Determine the current in the following circuit
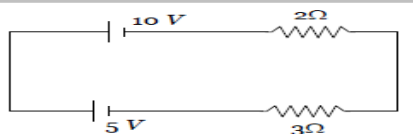
    (a) 1 A   (b) 2.5 A
    (c) 0.4 A   (d) 3 A

48. In the circuit shown in figure, find the current through
    the branch BD
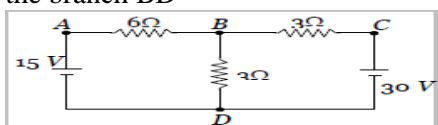
    (a) 5 A   (b) 0 A
    (c) 3 A   (d) 4 A

49. The figure shows a network of currents. The
    magnitude of current is shown here. The current i will
    be
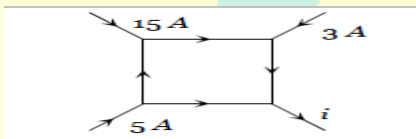
    (a) 3 A   (b) 13 A
    (c) 23 A   (d) – 3 A

50. Consider the circuit shown in the figure. The current i_3
    is equal to
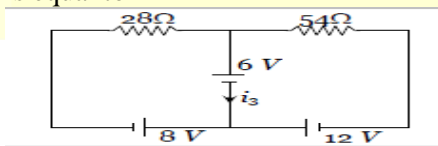
    (a) 5 amp   (b) 3 amp
    (c) – 3 amp   (d) – 5/6 amp

PART-II.

51. 20.0 g of a magnesium carbonate sample
    decomposes on heating to give carbon dioxide and
    8.0 g magnesium oxide. What will be the percentage
    purity of magnesium carbonate in the sample? (At.
    wt. of Mg = 24)
    (a) 96   (b) 60
    (c) 84   (d) 75

52. According to the Bohr theory, which of the following
    transitions in the hydrogen atom will give rise to the
    least energetic photon?
    (a) n = 6 to n = 1   (b) n = 5 to n = 4
    (c) n = 6 to n = 5   (d) n = 5 to n = 3

53. One of the characteristic properties of non-metals is
    that they

(a) are reducing agents
(b) form basic oxides
(c) form cations by electron gain
(d) are electronegative.

54. Linear combination of two hybridized orbitals
    belonging to two atoms and each having one
    electron leads to the formation of
    (a) sigma bond
    (b) double bond
    (c) co-ordinate covalent bond
    (d) pi bond.

55. An ideal gas, obeying kinetic theory of gases
    cannot be liquefied, because
    (a) it solidifies before becoming a liquid
    (b) forces acting between its molecules are
    negligible
    (c) its critical temperature is above 0°C
    (d) its molecules are relatively small in size

56. Cell reaction is spontaneous when
    (a) $\Delta G°$ is negative   (b) $\Delta G°$ is positive
   (c) $\Delta E°red$ is positive   (d) $\Delta E°red$ is negative.

57. In Haber process, 30 litres of dihydrogen and 30
    litres of dinitrogen were taken for reaction which
    yielded only 50% of the expected product. What
    will be the composition of gaseous mixture under
    the aforesaid condition in the end?
    (a) 20 litres ammonia, 20 litres nitrogen, 20 litres
    hydrogen
    (b) 10 litres ammonia, 25 litres nitrogen, 15 litres
    hydrogen
    (c) 20 litres ammonia, 10 litres nitrogen, 30 litres
    hydrogen
    (d) 20 litres ammonia, 25 litres nitrogen, 15 litres
    hydrogen

58. A mixture of potassium chlorate, oxalic acid and
    sulphuric acid is heated. During the reaction
    which element undergoes maximum change in
    the oxidation number?
    (a) S   (b) H
    (c) Cl   (d) C

59. Which of the following metal evolves hydrogen
    on reacting with cold dilute HNO_3?
    (a) Mg   (b) Al
    (c) Fe   (d) Cu

60. Compared with the alkaline earth metals, the
    alkali metals exhibit
    (a) smaller ionic radii
    (b) highest boiling points
    (c) greater hardness
    (d) lower ionization energies

61. The basic structural unit of silicates is
    (a) SiO_3^{2-} (b) SiO_4^{2-}
    (c) SiO^- (d) SiO_4^{4-}

62. Which of the following statements is not correct for a nucleophile?
(a) Ammonia is a nucleophile.
(b) Nucleophiles attack low e– density sites.
(c) Nucleophiles are not electron seeking.
(d) Nucleophile is a Lewis acid.

63. Which is maximum stable?
(a) 1-Butene
(b) cis-2-Butene
(c) trans-2-Butene
(d) All have same stability

64. About 20 km above the earth, there is an ozone layer. Which one of the following statements about ozone and ozone layer is true?
(a) It is beneficial to us as it stops U.V. radiation.
(b) Conversion of O_3 to O_2 is an endothermic reaction.
(c) Ozone is a triatomic linear molecule.
(d) It is harmful as it stops useful radiation

65. AB crystallizes in a body-centred cubic lattice with edge length 'a' equal to 387 pm. The distance between two oppositely charged ions in the lattice is
(a) 335 pm
(b) 250 pm
(c) 200 pm
(d) 300 pm

66. From the colligative properties of solution, which one is the best method for the determination of molecular weight of proteins and polymers?
(a) Osmotic pressure
(b) Lowering in vapour pressure
(c) Lowering in freezing point
(d) Elevation in boiling point

67. The pressure of H_2 required to make the potential of H_2 electrode zero in pure water at 298 K is
(a) 10^{-10} atm
(b) 10^{-4} atm
(c) 10^{-14} atm
(d) 10^{-12} atm

68. A reaction is 50% complete in 2 hours and 75% complete in 4 hours. The order of reaction is
(a) 1
(b) 2
(c) 3
(d) 0

69. The enzyme which hydrolyses triglycerides to fatty acids and glycerol is called
(a) maltase
(b) lipase
(c) zymase
(d) pepsin.

70. Identify the correct statement from the following
(a) Wrought iron is impure iron with 4% carbon.
(b) Blister copper has blistered appearance due to evolution of CO_2.
(c) Vapour phase refining is carried out for Nickel by van Arkel method.
(d) Pig iron can be moulded into a variety of shapes.

71. Aqueous solution of ammonia consists of
(a) H^+
(b) OH^-
(c) NH_4^+
(d) NH_4^+ and OH^-.

72. Which one of the following characteristics of the transition metals is associated with their catalytic activity?
(a) High enthalpy of atomization
(b) Paramagnetic behaviour
(c) Colour of hydrated ions
(d) Variable oxidation states

73. Number of possible isomers for the complex $[Co(en)_2Cl_2]Cl$ will be (en = ethylenediamine)
(a) 1
(b) 3
(c) 4
(d) 2

74. In an SN1 reaction on chiral centres, there is
(a) inversion more than retention leading to partial racemization
(b) 100% retention
(c) 100% inversion
(d) 100% racemisation.

75. When phenol is treated with CHCl3 and NaOH, the product formed is
(a) benzaldehyde
(b) salicylaldehyde
(c) salicylic acid
(d) benzoic acid.

76. CH_3CHO and $C_6H_5CH_2CHO$ can be distinguished chemically by
(a) Benedict's test
(b) iodoform test
(c) Tollens' reagent test
(d) Fehling's solution test

77. Which product is formed, when acetonitrile is hydrolysed partially with cold concentrated HCl?
(a) Methyl cyanide
(b) Acetic anhydride
(c) Acetic acid
(d) Acetamide

78. Number of chiral carbons in β-D-(+) glucose is
(a) five
(b) six
(c) three
(d) four.

79. Which of the following gives positive Fehling solution test?
(a) Sucrose
(b) Glucose
(c) Fats
(d) Protein

80. Which of the following is an amine hormone?
(a) Insulin
(b) Progesterone
(c) Thyroxine
(d) Oxypurin

81. Terylene is a condensation polymer of ethylene glycol and
(a) salicylic acid
(b) phthalic aci
(c) benzoic acid
(d) terephthalic acid.

82. The biodegradable polymer is
(a) buna-S
(b) nylon-6,6
(c) nylon-2-nylon 6
(d) nylon-6.

83. $CF_2 CF_2$ is monomer of
(a) teflon
(b) orlon
(c) polythene
(d) nylon-6

84. Which compound forms linear polymer due to H-bond?
(a) H_2O (b) NH_3
(c) HF (d) HCl

85. Diazo coupling is useful to prepare some
(a) pesticides   (b) dyes
(c) proteins   (d) vitamins.

86. Chloropicrin is obtained by the reaction of
(a) steam on carbon tetrachloride
(b) nitric acid on chlorobenzene
(c) chlorine on picric acid
(d) nitric acid on chloroform

87. The number of oxygen atoms in 4.4 g of CO_2 is
(a) 1.2×10^{23} (b) 6×10^{22}
(c) 6×10^{23} (d) 12×10^{23}

88. The amount of zinc required to produce 224 mL of H_2 at STP on treatment with dilute H_2SO_4 will be
(a) 65 g   (b) 0.065 g
(c) 0.65 g   (d) 6.5 g

89. In hydrogen atom, energy of first excited state is –3.4 eV. Then find out K.E. of same orbit of hydrogen atom. (a) +3.4 eV   (b) +6.8 eV
(c) –13.6 eV   (d) +13.6 eV

90. For azimuthal quantum number $l = 3$, the maximum number of electrons will be
(a) 2   (b) 6
(c) 0   (d) 14

91. Which electronic configuration of an element has abnormally high difference between second and third ionization energy?
(a) $1s^2, 2s^2, 2p^6, 3s^1$
(b) $1s^2, 2s^2, 2p^6, 3s^1, 3p^1$
(c) $1s^2, 2s^2, 2p^6, 3s^2, 3p^2$
(d) $1s^2, 2s^2, 2p^6, 3s^2$

92. Which of the following would have a permanent dipole moment?
(a) SiF_4 (b) SF_4
(c) XeF_4 (d) BF_3

93. 50 mL of hydrogen diffuses out through a small hole of a vessel, in 20 minutes. The time taken by 40 mL of oxygen to diffuse out is
(a) 32 minutes   (b) 64 minutes
(c) 8 minutes   (d) 12 minutes

94. Under isothermal conditions, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is [Given that 1 L bar = 100 J]
(a) 30 J   (b) –30 J
(c) 5 kJ   (d) 25 J

95. 2 moles of ideal gas at 27°C temperature is expanded reversibly from 2 lit. to 20 lit. Find entropy change. (R = 2 cal/mol K)
(a) 92.1   (b) 0

(c) 4   (d) 9.2

96. For a given exothermic reaction, K_p and K'_p are the equilibrium constants at temperatures T_1 and T_2, respectively. Assuming that heat of reaction is constant in temperature range between T_1 and T_2, it is readily observed that
(a) $K_p > K'_p$ (b) $K_p < K'_p$
(c) $K_p = K'_p$ (d) $K_p = \frac{1}{K_p}$

97. The oxide, which cannot act as a reducing agent is
(a) CO_2 (b) ClO_2
(c) NO_2 (d) SO_2

98. Which of the following groups of ions makes the water hard?
(a) Sodium and bicarbonate
(b) Magnesium and chloride
(c) Potassium and sulphate
(d) Ammonium and chloride

99. Which of the following is an amphoteric hydroxide?
(a) $Be(OH)_2$ (b) $Sr(OH)_2$
(c) $Ca(OH)_2$ (d) $Mg(OH)_2$

100. Which one of the following elements is unable to form MF_6^{3-} ion?
(a) Ga   (b) Al
(c) B   (d) In
PART-III.

101. Pancreatic juice and hormones of pancreas are produced by
(a) same cells
(b) same cells at different times
(c) statment is wrong
(d) different cells.

102. Secretin stimulates production of
(a) saliva   (b) gastric juice
(c) bile   (d) pancreatic juice.

103. Wharton's duct is associated with
(a) sublingual salivary gland
(b) parotid salivary gland
(c) submaxillary salivary gland
(d) Brunner's glands.

104. Duct leading from parotid gland and opening into vestibule is
(a) Haversian duct   (b) Stenson's duct
(c) Wolffian duct   (d) infra-orbital duct

105. Lamina propria is connected with
(a) acini   (b) liver
(c) Graafian follicle   (d) intestine.

106. The enzyme enterokinase helps in conversion of
(a) protein into polypeptides
(b) trypsinogen into trypsin
(c) caseinogen into casein

(d) pepsinogen into pepsin.

107. Identify the cells whose secretion protects the lining of gastro-intestinal tract from various enzymes.
(a) Duodenal cells   (b) Chief cells
(c) Goblet cells   (d) Oxyntic cells

108. Which of the following gastric cells indirectly help in erythropoiesis?
(a) Chief cells   (b) Mucous cells
(c) Goblet cells   (d) Parietal cells

109. Which of the following options best represents the enzyme composition of pancreatic juice?
(a) Amylase, Pepsin, Trypsinogen, Maltase
(b) Peptidase, Amylase, Pepsin, Rennin
(c) Lipase, Amylase, Trypsinogen, Procarbo- xypeptidase
(d)Amylase, Peptidase, Trypsinogen, Rennin

110. In the stomach, gastric acid is secreted by the
(a) peptic cells   (b) acidic cells
(c) gastrin secreting cells (d) parietal cells.

111. Bulk of carbon dioxide (CO_2) released from body tissues into the blood is present as
(a)bicarbonate in blood plasma and RBCs
(b) free CO_2 in blood plasma
(c)70% carbamino-haemoglobin and 30% as bicarbonate
(d)carbamino-haemoglobin in RBCs.

112. What is true about RBCs in humans?
(a)They carry about 20-25 percent of CO_2.
(b)They transport 99.5 percent of O_2.
(c)They transport about 80 percent oxygen only and the rest 20 percent of it is transported in dissolved state in blood plasma.
(d)They do not carry CO_2 at all.

113. The haemoglobin of a human fetus
(a)has only 2 protein subunits instead of 4
(b)has a higher affinity for oxygen than that of an adult
(c)has a lower affinity for oxygen than that of the adult
(d)its affinity for oxygen is the same as that of an adult.

114. The majority of carbon dioxide produced by our body cells is transported to the lungs as
(a)attached to haemoglobin   (b)dissolved in the blood
(c)as bicarbonates   (d)as carbonates.

115. Haemoglobin is a type of
(a)carbohydrate   (b) respiratory pigment
(c) vitamin   (d) skin pigment.

116. How the transport of O_2 and CO_2 by blood happens?
(a)With the help of WBCs and blood serum
(b)With the help of platelets and corpuscles
(c)With the help of RBCs and blood plasma
(d)With the help of RBCs and WBCs

117. At high altitude, the RBCs in the human blood will
(a)increase in number (b) decrease in number
(c)increase in size (d) decrease in size.

118. Although much CO_2 is carried in blood, yet blood
(a)CO_2 is continuously diffused through the tissues and is not allowed to accumulate
(b)in CO_2 transport, blood buffers play an important role
(c) CO_2 is absorbed by the leucocytes
(d) CO_2 combines with water to form H_2CO_3 which is neutralised by $NaCO_3$.

119. The carbon dioxide is transported via blood to lungs mostly
(a)in combination with haemoglobin only
(b)dissolved in blood plasma
(c)in the form of bicarbonate ions
(d)as carbamino-haemoglobin and as carbonic acid

120. Carbon dioxide is transported from tissues to respiratory surface by only
(a) plasma and erythrocytes
(b) plasma
(c) erythrocytes
(d) erythrocytes and leucocytes.

121. Which is the principal cation in the plasma of the blood?
(a)Potassium   (b) Magnesium
(c) Calcium   (d) Sodium

122. The blood group, with antibody-A and antibody-B is
(a)O   (b) B
(c) A   (d) AB.

123. The problem, due to Rh− factor arises when the blood of two (Rh+ and Rh−) mix up
(a)during pregnancy   (b) in a test tube
(c) through transfusion   (d) both (a) and (c)

124. Which of the following is agranulocyte?
(a)Basophil   (b) Neutrophil
(c) Lymphocyte   (d) Eosinophil

125. The life span of human WBC is approximately
(a)between 2 to 3 months
(b)more than 4 months
(c)less than 10 days
(d)between 20 to 30 days.

126. Vitamin K is required for
(a)change of prothrombin into thrombin

(b)synthesis of prothrombin

(c)change of fibrinogen to fibrin

(d)formation of thromboplastin.

127. Cells formed in bone marrow include

(a)RBCs   (b) RBCs and leucocytes

(c) leucocytes   (d) lymphocytes.

128. Component of blood responsible for producing antibodies is

(a)thrombocytes   (b) monocytes

(c) erythrocytes (d) lymphocytes.

129. Blood group AB has

(a)no antigen

(b)no antibody

(c)neither antigen nor antibody

(d)both antigen and antibody.

130. Carbonic anhydrase occurs in

(a)lymphocytes   (b) blood plasma

(c) RBCs   (d) leucocytes.

131. Glucose is taken back from glomerular filtrate through

(a)active transport   (b) passive transport

(c) osmosis   (d) diffusion.

132. Under normal conditions which one is completely reabsorbed in the renal tubule?

(a)Urea   (b) Uric acid

(c) Salts   (d) Glucose

133. Brush border is characteristic of

(a)neck of nephron

(b)collecting tube

(c)proximal convoluted tubule

(d)all of these.

134. Reabsorption of useful substances from glomerular filtrate occurs in

(a)collecting tube

(b)loop of Henle

(c)proximal convoluted tubule

(d)distal convoluted tubule.

Mechanism of Concentration of the Filtrate

135. Which of the following factors is responsible for the formation of concentrated urine?

(a)Hydrostatic pressure during glomerular filtration.

(b)Low levels of antidiuretic hormone.

(c)Maintaining hyperosmolarity towards the medullary interstitium in the kidneys.

(d)Secretion of erythropoietin by Juxtaglomerular complex.   (NEET

136. If Henle's loop were absent from mammalian nephron, which one of the following is to be expected

(a)There will be no urine formation.

(b)There will be hardly any change in the quality and quantity of urine formed .

(c)The urine will be more concentrated.

(d)The urine will be more dilute.

137. Concentration of urine depends upon which organ?

(a)Bowman's capsule

(b)Length of Henle's loop

(c)PCT

(d)Network of capillaries arising from glomerulus

138. Which of the following would help in prevention of diuresis?

(a)More water reabsorption due to undersecretion of ADH.

(b)Reabsorption of Na+ and water from renal tubules due to aldosterone.

(c)Atrial natriuretic factor causes vasoconstriction.

(d)Decrease in secretion of renin by JG cells.

139. A decrease in blood pressure/volume will not cause the release of

(a)atrial natriuretic factor   (b)aldosterone

(c)ADH   (d)renin.

140. Which of the following causes an increase in sodium reabsorption in the distal convoluted tubule?

(a)Increase in aldosterone levels

(b)Increase in antidiuretic hormone levels

(c)Decrease in aldosterone levels

(d)Decrease in antidiuretic hormone levels

141. Sternum is connected to ribs by

(a)bony matter

(b)white fibrous cartilage

(c)hyaline cartilage

(d)areolar tissue.

142. Bone related with skull is

(a)coracoid   (b) arytenoid

(c) pterygoid   (d) atlas.

143. Total number of bones in each limb of a man is

(a) 24   (b) 30

(c) 14   (d) 21.

144. The number of floating ribs in the human body is

(a)3 pairs   (b) 2 pairs

(c) 6 pairs   (d) 5 pairs.

145. Which of the following components is a part of the pectoral girdle?

(a)Sternum   (b) Acetabulum

(c) Glenoid cavity   (d) Ilium

146. The cervical vertebrae in human is
(a) same as in whale
(b) more than that in rabbit
(c) double than that of horse
(d) less than that in giraffe.

147. Long bones function in
(a) support
(b) support, erythrocyte and leucocyte synthesis
(c) support and erythrocyte synthesis
(d) erythrocyte formation.

148. Number of cervical vertebrae in camel is
(a) more than that of rabbit
(b) less than that of rabbit
(c) same as that of whale
(d) more than that of horse.

149. A deltoid ridge occurs in
(a) radius   (b) ulna
(c) femur   (d) humerus.

150. Match the following joints with the bones involved:

(1) Gliding joint   (i) Between carpal and metacarpal of thumb
(2) Hinge joint   (ii) Between atlas and axis
(3) Pivot joint   (iii) Between the carpals
(4) Saddle joint   (iv) Between humerus and ulna.
Select the correct option from the following:
(a) (1)-(iii), (2)-(iv), (3)-(ii), (4)-(i)
(b) (1)-(iv), (2)-(i), (3)-(ii), (4)-(iii)
(c) (1)-(iv), (2)-(ii), (3)-(iii), (4)-(i)
(d) (1)-(i), (2)-(iii), (3)-(ii), (4)-(iv)

151. Consider following features.
(A) Organ system level of organisation
(B) Bilateral symmetry
(C) True coelomates with segmentation of body Select the correct option of animal groups which possess all the above characteristics.
(a) Annelida, Mollusca and Chordata
(b) Annelida, Arthropoda and Chordata
(c) Annelida, Arthropoda and Mollusca
(d) Arthropoda, Mollusca and Chordata

152. Which of the following animals are true coelomates with bilateral symmetry?
(a) Adult Echinoderms
(b) Aschelminthes
(c) Platyhelminthes
(d) Annelids

153. Which one of the following kinds of animals are triploblastic
(a) Flatworms   (b) Sponges
(c) Ctenophore   (d) Corals

154. Which one of the following statements about certain given animals is correct?
(a) Roundworms (Aschelminthes) are pseudo-coelomates.
(b) Molluscs are acoelomates.

(c) Insects are pseudocoelomates.
(d) Flatworms (Platyhelminthes) are coelomates.

155. Which one of the following groups of animals is bilaterally symmetrical and triploblastic?
(a) Aschelminthes (roundworms)
(b) Ctenophores
(c) Sponges
(d) Coelenterates (cnidarians)

156. Metameric segmentation is the characteristic of
(a) mollusca and chordata
(b) platyhelminthes and arthropoda
(c) echinodermata and annelida
(d) annelida and arthropoda.

157. The animals with bilateral symmetry in young stage and radial pentamerous symmetry in the adult stage, belong to the Phylum
(a) Annelida   (b) Mollusca
(c) Cnidaria   (d) Echinodermata.

158. Which of the following animals have scattered cells with cell - tissue grade organisation?
(a) Sponge   (b) Hydra
(c) Liver fluke   (d) Ascaris

159. Coelom is found between
(a) body wall and ectoderm
(b) ectoderm and endoderm
(c) mesoderm and body wall (endoderm)
(d) mesoderm and ectoderm.

160. Besides annelida and arthropoda, the metamerism is exhibited by
(a) mollusca   (b) acanthocephala
(c) cestoda   (d) chordata.

161. Cuboidal epithelium with brush border of microvilli is found in
(a) lining of intestine
(b) ducts of salivary glands
(c) proximal convoluted tubule of nephron
(d) Eustachian tube

162. Goblet cells of alimentary canal are modified from
(a) squamous epithelial cells
(b) columnar epithelial cells
(c) chondrocytes
(d) compound epithelial cells.

163. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in
(a) bronchioles and Fallopian tubes
(b) bile duct and bronchioles
(c) Fallopian tubes and pancreatic duct

164. Eustachian tube and salivary duct. Smooth muscles are
(a) involuntary, fusiform, non-striated
(b) voluntary, multinucleate, cylindrical
(c) involuntary, cylindrical, striated

(d) voluntary, spindle-shaped, uninucleate

165. Which type of tissue correctly matches with its location?

Tissue	Location
(a) Transitial nose epithelium	Tip of
(b) Cuboidal epithelium	Lining of stomach
(c) Smooth muscle	Wall of intestine
(d) Areolar tissue	Tendon

166. The function of the gap junction is to
(a) separate two cells from each other
(b) stop substance from leaking across a tissue
(c) performing cementing to keep neighbouring cells together
(d) facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.

167. Choose the correctly matched pair.
(a) Tendon - Specialized connective tissue
(b) Adipose tissue - Dense connective tissue
(c) Areolar tissue - Loose connective tissue
(d) Cartilage - Loose connective tissue

168. The supportive skeletal structures in the human external ears and in the nose tip are examples of
(a) Ligament   (b) areolar tissue
(c) bone   (d) cartilage

169. The epithelial tissue present on the inner surface of bronchioles and Fallopian tubes is
(a) glandular   (b) ciliated
(c) squamous   (d) cuboidal.

170. The cell junctions called tight, adhering and gap junctions are found in
(a) connective tissue   (b) epithelial tissue
(c) neural tissue   (d) muscular tissue.

171. The shared terminal duct of the reproductive and urinary system in the human male is
(a) urethra   (b) ureter
(c) vas deferens   (d) vasa efferentia.

172. The Leydig's cells as found in the human body are the secretory source of
(a) Progesterone   (b) intestinal mucus
(c) glucagon   (d) androgens.

173. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from
(a) testes to epididymis
(b) epididymis to vas deferens
(c) ovary to uterus
(d) vagina to uterus.

174. The testes in humans are situated outside the abdominal cavity inside a pouch called scrotum. The purpose served is for
(a) maintaining the scrotal temperature lower than the internal body temperature
(b) escaping any possible compression by the visceral organs
(c) providing more space for the growth of epididymis
(d) providing a secondary sexual feature for exhibiting the male sex.

175. Sertoli cells are found in
(a) ovaries and secrete progesterone
(b) adrenal cortex and secrete adrenaline
(c) seminiferous tubules and provide nutrition to germ cells
(d) pancreas and secrete cholecystokinin.

176. Vasa efferentia are the ductules leading from
(a) testicular lobules to rete testis
(b) rete testis to vas deferens
(c) vas deferens to epididymis
(d) epididymis to urethra.

177. Seminal plasma in human males is rich in
(a) fructose and calcium
(b) glucose and calcium
(c) DNA and testosterone
(d) ribose and potassium.

178. Secretions from which one of the following are rich in fructose, calcium and some enzymes?
(a) Male accessory glands
(b) Liver
(c) Pancreas
(d) Salivary glands

179. Seminal plasma in humans is rich in
(a) fructose and calcium but has no enzymes
(b) glucose and certain enzymes but has no calcium
(c) fructose and certain enzymes but poor in calcium
(d) fructose, calcium and certain enzymes

180. Male hormone is produced in the testis by cells of
(a) Sertoli   (b) epithelial
(c) spermatocytes   (d) Leydig

181. In context of amniocentesis, which of the following statements is incorrect?
(a) It can be used for detection of Down's syndrome.
(b) It can be used for detection of cleft palate.
(c) It is usually done when a woman is between 14-16 weeks pregnant.
(d) It is used for prenatal sex determination.

182. Which of the following cannot be detected in a developing fetus by amniocentesis?
(a) Down's syndrome
(b) Jaundice
(c) Klinefelter's syndrome
(d) Sex of the fetus

183. The permissible use of the technique amniocentesis is for
(a) detecting sex of the unborn fetus
(b) artificial insemination
(c) transfer of embryo into the uterus of a surrogate mother

(d) detecting any genetic abnormality.

184. Fetal sex can be determined by examining cells from the amniotic fluid by looking for
(a) chiasmata   (b) kinetochore
(c) barr bodies   (d) autosomes

185. Which of the following contraceptive methods involve a role of hormone ?
(a) Pills, Emergency contraceptives, Barriermethods
(b) Lactational amenorrhea, Pills, Emergencycontraceptives
(c) Barrier method, Lactational amenorrhea, Pills
(d) CuT, Pills, Emergency contraceptive

186. Select the hormone-releasing Intra-Uterine Devices.
(a) Lippes Loop, Multiload 375
(b) Vaults, LNG-20
(c) Multiload 375, Progestasert
(d) Progestasert, LNG-20

187. Which of the following is a correct statement?
(a) IUDs once inserted need not be replaced.
(b) IUDs are generally inserted by the user herself.
(c) IUDs increase phagocytosis of sperms in theuterus.
(d) IUDs suppress gametogenesis.

188. The contraceptive 'Saheli'
(a) blocks estrogen receptors in the uterus, preventing eggs from getting implanted
(b) increases the concentration of estrogen andprevents ovulation in females
(c) is an IUD
(d) is a post-coital contraceptive.

189. The function of copper ions in copper releasingIUDs
(a) they inhibit gametogenesis
(b) they make uterus unsuitable for implantation
(c) they inhibit ovulation
(d) they suppress sperm motility and fertilising capacity of sperms.

190. Which of the following is hormone-releasing IUD?
(a) LNG-20   (b) Multiload 375
(c) Lippes Loop   (d) Cu7

191. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask.
(a) CH_4, H_2, NH_3 and water vapor at 800°C
(b) CH_3, H_2, NH_4 and water vapor at 800°C
(c) CH_4, H_2, NH_3 and water vapor at 600°C
(d) CH_3, H_2, NH_3 and water vapor at 600°C

192. Which of the following is the correct sequence of events in the origin of life?
I. Formation of protobionts
II. Synthesis of organic monomers
III. Synthesis of organic polymers
IV. Formation of DNA-based genetic systems
(a) I, II, III, IV   (b) I, III, II, IV
(c) II, III, I, IV   (d) II, III, IV, I

193. Following are the two statements regarding the origin of life.
(A) The earliest organisms that appeared on the earthwere non-green and presumably anaerobes.
(B) The first autotrophic organisms were the chemoautotrophs that never released oxygen.
Of the above statements which one of the followingoptions is correct?
(a) Both (A) and (B) are correct.
(b) Both (A) and (B) are false.
(c) (A) is correct but (B) is false.
(d) (B) is correct but (A) is false.

194. Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the abiogenic origin of life?
(a) They were partially isolated from thesurroundings.
(b) They could maintain an internal environment.
(c) They were able to reproduce.
(d) They could separate combinations of moleculesfrom the surroundings.

195. The concept of chemical evolution is based on
(a) interaction of water, air and clay under intense heat
(b) effect of solar radiation on chemicals
(c) possible origin of life by combination of chemicals under suitable environmentalconditions
(d) crystallisation of chemicals.

196. Which of the following amino acids was not found to be synthesised in Miller's experiment?
(a) Alanine   (b) Glycine
(c) Aspartic acid   (d) Glutamic acid

197. Which one of the following experiments suggests that simplest living organisms could not have originated spontaneously from non-living matter?
(a) Larvae could appear in decaying organic matter.
(b) Microbes did not appear in stored meat.
(c) Microbes appeared from unsterilised organicmatter.
(d) Meat was not spoiled, when heated and kept sealed in a vessel.

198. According to Oparin, which one of the following was not present in the primitive atmosphere of the earth?
(a) Methane   (b) Oxygen
(c) Hydrogen   (d) Water vapour

199. There is no life on moon due to the absence of
(a) O_2 (b) water
(c) light   (d) temperature.

200. Most abundant organic compound on earth is
(a) protein   (b) cellulose
(c) lipids   (d) steroids.

CENTURION DEFENCE ACADEMY
MNS MODAL TEST-ANSWER KEY

No.	Ans	No.	Ans	No.	Ans	No.	Ans	No.	Ans	No.	Ans	No.	Ans
1.	A	31.	B	61.	D	91.	D	121.	D	151.	B	181.	B
2.	C	32.	A	62.	D	92.	B	122.	A	152.	D	182.	B
3.	B	33.	C	63.	C	93.	B	123.	D	153.	A	183.	D
4.	C	34.	B	64.	A	94.	B	124.	C	154.	A	184.	C
5.	C	35.	C	65.	A	95.	D	125.	C	155.	A	185.	B
6.	B	36.	C	66.	A	96.	A	126.	B	156.	D	186.	D
7.	D	37.	D	67.	C	97.	A	127.	B	157.	D	187.	C
8.	D	38.	D	68.	A	98.	B	128.	D	158.	B	188.	A
9.	A	39.	C	69.	B	99.	A	129.	C	159.	C	189.	D
10.	C	40.	D	70.	B	100.	C	130.	C	160.	D	190.	A
11.	A	41.	B	71.	D	101.	D	131.	A	161.	C	191.	C
12.	B	42.	D	72.	D	102.	D	132.	D	162.	B	192.	C
13.	B	43.	A	73.	B	103.	C	133.	C	163.	A	193.	A
14.	A	44.	B	74.	A	104.	B	134.	C	164.	A	194.	C
15.	A	45.	B	75.	B	105.	D	135.	C	165.	C	195.	C
16.	A	46.	B	76.	B	106.	B	136.	D	166.	D	196.	D
17.	A	47.	A	77.	D	107.	C	137.	B	167.	C	197.	D
18.	C	48.	A	78.	D	108.	D	138.	B	168.	D	198.	B
19.	B	49.	C	79.	B	109.	C	139.	B	169.	B	199.	B
20.	C	50.	D	80.	C	110.	D	140.	A	170.	B	200.	B
21.	B	51.	C	81.	D	111.	A	141.	C	171.	B		
22.	A	52.	C	82.	C	112.	A	142.	C	172.	D		
23.	B	53.	D	83.	A	113.	B	143.	B	173.	A		
24.	B	54.	A	84.	C	114.	C	144.	B	174.	A		
25.	D	55.	B	85.	B	115.	B	145.	C	175.	C		
26.	A	56.	A	86.	D	116.	C	146.	A	176.	B		
27.	C	57.	B	87.	A	117.	A	147.	B	177.	A		
28.	C	58.	C	88.	C	118.	B	148.	C	178.	A		
29.	D	59.	A	89.	A	119.	C	149.	D	179.	D		
30.	A	60.	D	90.	D	120.	A	150.	A	180.	D		