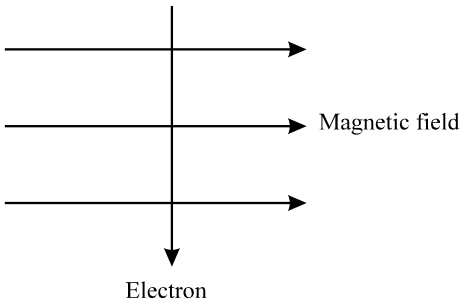
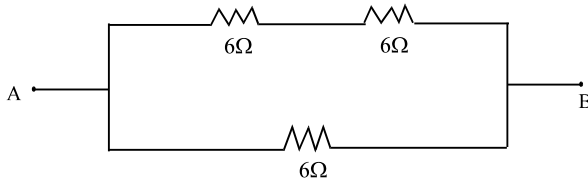


PHYSICS

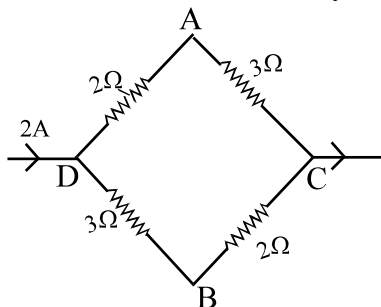
1. No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be
A) plane B) concave C) convex D) either A or B
2. Rainbow is formed due to
A) reflection and dispersion of light through a water droplet
B) total internal reflection and dispersion of light through a water droplet
C) only dispersion of light
D) only refraction of light
3. The sun is visible to us about 2 minutes before the actual sunrise due to
A) polarization B) reflection
C) atmospheric refraction D) total internal reflection
4. Which of the following lens is used to minimize hypermetropia?
A) convex B) concave lens C) cylindrical lens D) none of these
5. The SI unit of electric charge is
A) coulomb B) ampere C) volt D) none of these
6. A current of 0.5A is drawn by a filament of an electric bulb for 10 minutes. Find the amount of electric charge that flows through the circuit
A) 600C B) 300C C) 400C D) 150C
7. The filament of an electric bulb is made of tungsten because
A) its resistance is negligible B) it is cheaper
C) its melting point is very high D) its filament is easily made
8. Which of the following terms do not represent electrical power in a circuit?
A) I^2R B) IR^2 C) VI D) $\frac{V^2}{R}$
9. An electron enters a magnetic field at right angles to it, as shown in the fig. The direction of force acting on the electron will be


A) to the right B) to the left C) out of the page D) into the page
10. The source of energy of the sun is
A) nuclear fusion B) nuclear fission C) chemical reaction D) none of these
11. A concave lens has focal length of 15 cm. At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens?
A) 20 cm B) 25 cm C) 30 cm D) 35 cm

12. Calculate the equivalent resistance between the points A and B in the following circuit

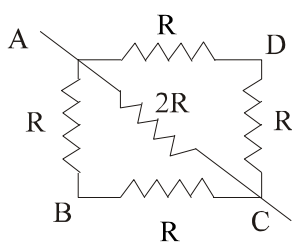


- A) 2Ω B) 3Ω C) 4Ω D) 5Ω
13. Two thin lenses are in contact and focal length of the combination is 80 cm. If the focal length of one lens is 20 cm, then what would be power of the other lens ?
 A) -3.25 D B) -3.50 D C) 3 D D) -3.75 D
14. Most of the source of energy we use represent stored solar energy. Which of the following is not ultimately derived from the Sun's energy?
 A) Geothermal energy B) Wind energy C) Nuclear energy D) Bio-mass
15. An electric heater of 1500 watt is switched on for 10 hours. The electric energy consumed by the heater is
 A) $5.4 \times 10^7\text{ J}$ B) $3.6 \times 10^7\text{ J}$ C) $1.8 \times 10^7\text{ J}$ D) $0.9 \times 10^7\text{ J}$
16. The strength of the magnetic field around an infinite current carrying conductor is
 A) same everywhere B) directly proportional to distance
 C) inversely proportional to distance D) inversely proportional to the square of distance
17. The filament of an electric bulb is made of tungsten because
 A) Its resistance is negligible B) It is cheaper
 C) Its melting point is high D) Its filament is easily made
18. A current of 2A flows in a system of conductors as shown . The potential difference ($V_A - V_B$) will be



- A) $+2\text{ V}$ B) $+1\text{ V}$ C) -1 V D) -2 V
19. Which is the correct expression for a mirror
 A) $m = \frac{f}{f - u}$ B) $f = R$ C) $f = 2R$ D) $m = \frac{-u}{v}$
20. An electron has a circular path of radius 0.01m in a perpendicular magnetic induction 10^{-3} T find the speed of electron
 A) $1.76 \times 10^6\text{ m/s}$ B) $1.76 \times 10^{-6}\text{ m/s}$ C) 1.76 m/s D) none
21. Force acting on a stationary charge Q in the magnetic field. B is
 A) BQV B) Bv/Q C) zero D) BQ/v
22. A charged particle move through a magnetic field directed \perp r to its direction of motion. Which of the following quantities of the particle will not change?
 A) momentum B) speed C) velocity D) none of these
23. An electric iron draws current of 4A. When connected to a 220V mains it resistance must be
 A) 40Ω B) 100Ω C) 55Ω D) none
24. Calculate the resistance of an electric bulb which allows a 10A current when connected to a 220 V power source
 A) 20Ω B) 22Ω C) 40Ω D) 60Ω

25. A thin layer of water is transparent but very thick layer of water is
 A) Opaque B) mist transparent C) Translucent D) none
26. Light is a _____ wave
 A) Longitudinal B) Mechanical C) Transverse waves D) A and B
27. Energy possessed by wind is
 A) P.E B) KE C) Heat D) sound
28. 1 eV _____ J?
 A) $1.6 \times 10^{-19}J$ B) $1.6 \times 10^{19}J$ C) $1.6 \times 10^{20}J$ D) 1.6J
29. If a million electrons travels through a conductor in 1 micro second, how many nano ampere of current are flowing through it
 A) 160 nA B) 1600 nA C) 16 nA D) none
30. Find the effective resistance between point A and C



- A) $3/2R$ B) $6R$ C) $3R$ D) $2/3R$
31. Which of the following sound of given frequencies can be heard by us?
 A) 10HZ B) 10 GHZ C) 10MHZ D) 10 KHZ
32. The distance between a town and factory is 30km. A man started to walk from the factory to the town at 6.30 am. While a cyclist left the town for the factory at 6.50 am riding at a speed of 18kmhr^{-1} , the man met the cyclist after walking 6km. Find at what time they met.
 A) 7.30 am B) 8 am C) 8.10 am D) 8.30 am
33. Melting point of ice
 A) increases with increasing pressure
 B) decrease with increasing pressure
 C) is independent of pressure
 D) is proportional to pressure
34. A fan produces a feeling of comfort during hot weather because
 A) a fan supplies cool air B) our perspiration evaporates rapidly
 C) fan cools the air D) conductivity of air increases
35. A big explosion on the moon cannot be heard on the earth because
 A) The explosion produces high frequency sound waves which are inaudible.
 B) Sound waves require a material medium for propagation
 C) Sound waves are absorbed in the atmosphere of moon
 D) Sound waves are absorbed in earth's atmosphere
36. An electric current through a horizontal metal wire flows in east to west direction, direction of magnetic field at point directly above is from.
 A) East to West B) West to East C) North to South D) South to North
37. In a tug of war contest, two groups of people pull on a horizontal rope from the two ends the winning group will be one which
 A) exerts grater force on rope
 B) exerts a force on the rope which is greater than the tension in it.
 C) exerts greater force on ground
 D) makes a greater angle with the horizontal
38. Which of the following is a derived unit
 A) unit of mass B) unit of length C) unit of time D) unit of volume

39. Two bodies of masses 1 kg and 5 kg are dropped gently from the top of a tower . At a point 20 cm from ground both the bodies will have same
 A) momentum B) kinetic energy C) Velocity D) total energy
40. Two pieces of metal when immersed in a liquid have equal upthrust on them then
 A) Both pieces must have equal weights B) Both pieces must have equal densities
 C) Both pieces must have equal volume D) Both are floating to same depth.

CHEMISTRY

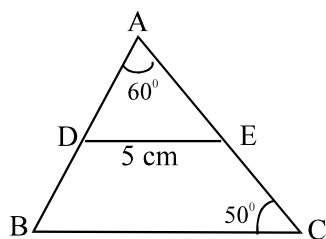
1. The chemical name of marble is
 A) Magnesium carbonate B) Calcium chloride
 C) Calcium sulphate D) Calcium carbonate
2. Chemical reaction $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$ is an example of
 A) Combination reaction B) decomposition reaction
 C) displacement reaction D) double displacement reaction
3. Modern periodic law was proposed by
 A) Mendeleev B) Henry moseley C) Werner D) Bohr and Bury
4. The non-metal having shining surface is:
 A) sulphur B) phosphorus C) iodine D) carbon
5. Plaster of paris is made from
 A) Lime stone B) Slaked lime C) Quick lime D) Gypsum
6. Alkali is a base that is:
 A) soluble in alcohol B) insoluble in alcohol C) soluble in water D) insoluble in water
7. Propanal is
 A) $\text{CH}_3 - \text{CHO}$ B) $\text{CH}_3 - \text{CH}_2 - \text{CHO}$
 C) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$ D) $\text{CH}_3 - \text{COOH}$
8. Which of the following is not a carbon allotrope?
 A) Graphite B) Diamond
 C) Buckminster fullerene D) Cyclohexane
9. $\text{CuO} + \text{H}_2 \rightarrow \text{H}_2\text{O} + \text{Cu}$, reaction is an example of :
 A) redox reaction B) synthesis reaction C) neutralisation D) analysis reaction
10. Acids react with metal carbonates to form -----
 A) hydrogen gas B) carbon dioxide gas C) nitrogen gas D) carbon monoxide
11. According to Mendeleev's periodic law which properties of the elements are the periodic function of their atomic masses :
 A) Physical properties only B) Chemical properties only
 C) Physical and chemical properties both D) None of these
12. The number of elements in the 4th period of periodic table are :
 A) 8 B) 18 C) 10 D) 32
13. Caustic soda is the common name for :
 A) $\text{Mg}(\text{OH})_2$ B) KOH C) $\text{Ca}(\text{OH})_2$ D) NaOH
14. Ionic compounds are soluble in :
 A) Water B) Benzene C) Ether D) Alcohol
15. Pure gold is equal to :
 A) 24 carat B) 100 carat C) 22 carat D) 1000 carat
16. $\text{Zn} + \text{H}_2\text{SO}_4(\text{dil}) \rightarrow \text{ZnSO}_4 + \text{H}_2 \uparrow$
 above equation is a :
 A) decomposition reaction B) single displacement reaction
 C) combination reaction D) synthesis reaction

17. Which is called quick lime
 A) $\text{Ca}(\text{OH})_2$ B) CaCO_3 C) CaO D) CO_2
18. Which is called king of chemicals
 A) HCl B) HNO_3 C) H_2SO_4 D) CH_3COOH
19. Which of the following has the largest size :
 A) Na B) Na^+ C) Mg D) Mg^{+2}
20. Antioxidants are
 A) Reducing agents B) Oxidising agents C) Dehydrating agents D) Hydrating agents
21. How many non metals are solids
 A) 9 B) 10 C) 11 D) 12
22. Which of the following element show high reactivity towards H_2
 A) F B) Cl C) Br D) I
23. Co-ordinate bond is also known as
 A) Dative bond B) Electrovalent bond C) Covalent bond D) Metallic bond
24. Calcination is the process of heating ore in
 A) the absence of air B) limited supply of air C) excess of air D) both A and B
25. Which of the following is a trihydric alcohol
 A) Ethanol B) Glycerol C) Glycol D) Butanol
26. $\text{CuO} + \text{H}_2 \longrightarrow \text{H}_2\text{O} + \text{Cu}$, reaction is an example of
 A) Redox reaction B) Synthesis reaction
 C) Neutralisation reaction D) Analysis reaction
27. When Zn react with con. H_2SO_4 , the gas evolved is
 A) O_2 B) H_2 C) SO_2 D) NO_2
28. Number of hydronium ion produced from an acid known as
 A) Acidity B) Neutrality C) Basicity D) Both A & B
29. Colour of phenolphthalein in acidic solution is
 A) Pink B) Orange C) Colourless D) Golden yellow
30. pH of 1M hydrochloric acid
 A) 0 B) 1 C) 2 D) 1.5
31. Which of the following are soft metals
 A) alkali metals B) alkaline earth metals C) d block D) f block
32. How many moles of electrons which weigh one kilogram
 A) 6×10^{23} B) $\frac{10^{31}}{9.108}$ C) $\frac{6 \times 10^{54}}{9}$ D) $\frac{10^8}{9.108 \times 6.02}$
33. Law of conservation of mass was coined by
 A) Dalton B) Lavoisier C) Proust D) Avogadeo
34. Which of the following is formed in corrosion
 A) $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ B) Ag_2S C) $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ D) All
35. Which of the following is called plum-pudding model of atom
 A) Bohr model B) Thomson model
 C) Rutherford's model D) none of the above
36. Which of the following statement is incorrectly matched
 A) Citric acid - Orange
 B) Vitamin C - Ascorbic acid
 C) Unripe mangoes - Tartaric acid
 D) Tamarind - Oxalic acid
37. Which of the following is not a mixture
 A) Gasoline B) Distilled water C) German silver D) rectified spirit

38. Which of the following statement is incorrect
 A) quartz contain SiO_2 units
 B) carbon has 3 isotopes
 C) Titanium is called little silver
 D) petrol contain hydrocarbons
39. The mass exactly equal to the $\frac{1}{12}$ th mass of a carbon-12 is called
 A) 1 amu
 B) 1u
 C) 1.66×10^{-24} g
 D) all
40. Molecular mass of a compound is 98.98. Its molecular formula is
 A) CH_2Cl
 B) $\text{C}_2\text{H}_4\text{Cl}_2$
 C) $\text{C}_3\text{H}_4\text{Cl}_2$
 D) $\text{C}_4\text{H}_8\text{Cl}_4$

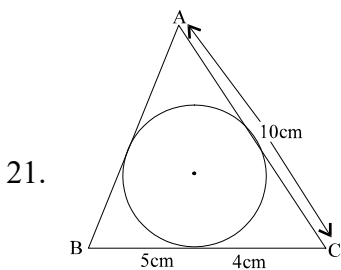
MATHEMATICS

1. Which of the following number (s) is/are rational?
 A) $\sin 15^\circ$
 B) $\cos 15^\circ$
 C) $\sin 15^\circ \cos 15^\circ$
 D) $\sin 15^\circ \cos 75^\circ$
2. The value of k for which the quadratic equation $2x^2 + kx + 3 = 0$ have two equal roots
 A) $k = \pm 2\sqrt{6}$
 B) $\pm\sqrt{6}$
 C) $\pm 3\sqrt{5}$
 D) $\pm 3\sqrt{6}$
3. $(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta) =$
 A) 0
 B) 1
 C) 2
 D) -1
4. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?
 A) 26 minutes
 B) 36 minutes
 C) 16 minutes
 D) 46 minutes
5. Find the area of the quadrilateral whose vertices, taken in order are $(-4, -2)$, $(-3, -5)$, $(3, -2)$ and $(2, 3)$
 A) 28 sq. units
 B) 25 sq. units
 C) 26 sq. units
 D) 30 sq. units
6. The number of terms of the AP 3, 7, 11, 15 to be taken so that the sum is 406 is
 A) 5
 B) 10
 C) 12
 D) 14
7. If A and B are $(-2, -2)$ and $(2, -4)$ respectively, find the co-ordinates of p such that $AP = \frac{3}{7}AB$ and P lies on the line segment AB
 A) $(\frac{-2}{7}, \frac{20}{7})$
 B) $(\frac{2}{7}, \frac{20}{7})$
 C) $(\frac{2}{7}, \frac{-10}{7})$
 D) $(\frac{-2}{7}, \frac{-20}{7})$
8. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6cm. Find the height of the cylinder?
 A) 2.74 cm
 B) 2.64 cm
 C) 2.53 cm
 D) 3.52 cm
9. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8m. Find the height of the tree?
 A) $2\sqrt{3}$ cm
 B) $10\sqrt{5}$ cm
 C) $8\sqrt{3}$ cm
 D) $6\sqrt{3}$ cm
10. If the mean and median of a set of numbers are 8.9 and 9 respectively, then the mode will be
 A) 7.2
 B) 8.2
 C) 9.2
 D) 10.2
11. In figure, D and E are the mid-points of sides AB and AC respectively of $\triangle ABC$, Find $\angle EDB$



- A) 110°
 B) 120°
 C) 70°
 D) 80°

12. Find a four-digit perfect square such that its first two digits are the same and its last two digits are the same:
 A) 7474 B) 5600 C) 4488 D) 7744
13. Find the area of a semi-circular plate of diameter 14 cm.
 A) 57 B) 72 C) 11 D) 77
14. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is
 A) 12 cm B) 13 cm C) 8.5 cm D) $\sqrt{119}$ cm
15. If $x - 2$ is to be a factor of $2x^3 - 4x^2 + x + k$, what should be the number k?
 A) 2 B) -2 C) 4 D) -4
16. Difference of two sides of a triangle is zero. The angle opposite to these are
 A) Equal B) Different C) Greater than the third D) None of these
17. C is the centre of a circle passing through the points P, Q, R and S taken in order. If $\angle PSR = 120^\circ$ and PQ is a diameter, then $\angle QPR =$
 A) 30° B) 40° C) 45° D) 50°
18. If $\sin A = x$, then what is the value of $\tan A$?
 A) $\frac{x}{1-x^2}$ B) $\frac{x}{\sqrt{1-x}}$ C) $\frac{x}{\sqrt{1-x^2}}$ D) $\frac{x}{1-x}$
19. The ratio of the surface area of two sphere is 3 : 5. What is the ratio of their volumes?
 A) 5 : 3 B) $\sqrt{3}:5$ C) 9 : 25 D) $3\sqrt{3}:5\sqrt{5}$
20. If the mean of 7, 13, 15, 5, a is 12. Find the value of 'a'.
 A) 30 B) 20 C) 18 D) 60

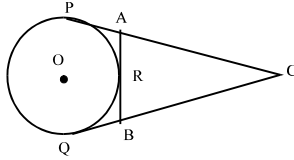


- In figure, $\triangle ABC$ is circumscribing a circle. Then the length of AB is
 A) 10 cm B) 11 cm C) 12 cm D) 13 cm
22. Two cones have their heights in the ratio 1:3 and the radii of their bases are in the ratio 3:2, then the ratio of their volumes is
 A) 1 : 3 B) 3:4 C) 4:3 D) 2:3
23. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is
 A) 8 B) 9 C) 7 D) 15
24. If one of the roots of the quadratic equation is $2 + \sqrt{3}$, then the quadratic equation is
 A) $x^2 + 4x - 1 = 0$ B) $x^2 - 4x + 1 = 0$
 C) $x^2 + (2 + \sqrt{3})x + 1 = 0$ D) $x^2 - (2 + \sqrt{3})x + 1 = 0$
25. The line segment joining the points $(-3, -4)$ and $(1, -2)$ is divided by the Y - axis in the ratio
 A) 3:1 B) 2:3 C) 1:3 D) 3:2

26. ABC is a right angled triangle, right angled at B such that BC = 6cm and AB = 8cm. A circle with centre O is inscribed in $\triangle ABC$. The radius of the circle is

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

27. In figure, CP and CQ are tangents from an external point C to a circle with centre O. AB is another tangent which touches the circle at R. If CP = 11cm and BR = 4cm, then the length of BC is



- A) 17cm B) 7cm C) 22cm D) 20cm

28. A rational number between $\sqrt{2}$ and $\sqrt{3}$ is

- A) 5/4 B) 6/5 C) 3/2 D) 4/3

29. Which is not an irrational number

- A) $8 - \sqrt{5}$ B) $\sqrt{5} + \sqrt{3}$ C) $4 + \sqrt{6}$ D) $6 + \sqrt{9}$

30. If the product of zeros of the polynomial $ax^2 - 6x - 6$ is 4, then the value of 'a' is

- A) 3/2 B) -3/2 C) 4/3 D) -3/4

31. A lady has 25 paise and 50 paise coins in her purse. If in all she has 40 coins totally Rs. 12.50, then the number of coins of each type she has

- A) 30,47 B) 30,45 C) 30,10 D) 10, 30

32. $\triangle ABC$ and $\triangle PQR$ are similar triangles such that $\angle A = 32^\circ$ and $\angle R = 65^\circ$ then $\angle B$ is

- A) 83° B) 32° C) 97° D) 65°

33. The perimeters of two similar triangles ABC and LMN are 60cm and 48cm respectively. If LM = 8cm, length of AB is

- A) 8cm B) 10cm C) 6cm D) 5cm

34. The difference between two numbers is 5 and difference in their squares is 65. The larger number is

- A) 12 B) 11 C) 10 D) 9

35. The sum of the squares of two consecutive positive integers is 545; then the integers are

- A) 19,15 B) 16,17 C) 26,17 D) 6,17

36. There is a point inside an equilateral triangle which is at distance 3, 4, 5 from the three sides. The area of the triangle is

- A) $12\sqrt{3}$ B) $24\sqrt{3}$ C) $36\sqrt{3}$ D) $48\sqrt{3}$

37. The number of distinct prime divisors of the number $256^3 - 130^3 - 126^3$ is

- A) 10 B) 5 C) 8 D) 15

38. How many real numbers x are there such that $(x\sqrt{x})^x = x^{x\sqrt{x}}$

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

39. Let P(x) be a quadratic polynomial $P(3) = 8$ and $P(-3) = -10$. Then the coefficient of x in P(x) is

- A) 4 B) 5 C) 3 D) 6

40. If $\tan A + \cot A = 4$, then $\tan^4 A + \cot^4 A =$

- A) 254 B) 256 C) 196 D) 194

PHYSICS

- | | |
|-------|-------|
| 1. D | 21. C |
| 2. B | 22. B |
| 3. C | 23. C |
| 4. A | 24. B |
| 5. A | 25. A |
| 6. B | 26. C |
| 7. C | 27. B |
| 8. B | 28. A |
| 9. D | 29. A |
| 10. A | 30. D |
| 11. C | 31. D |
| 12. C | 32. C |
| 13. D | 33. B |
| 14. D | 34. B |
| 15. A | 35. B |
| 15. C | 36. D |
| 17. C | 37. C |
| 18. B | 38. D |
| 19. A | 39. C |
| 20. A | 40. C |

CHEMISTRY

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|-------|-------|
| 1. D | 21. B |
| 2. A | 22. A |
| 3. D | 23. A |
| 4. C | 24. D |
| 5. D | 25. B |
| 6. C | 26. A |
| 7. B | 27. C |
| 8. D | 28. C |
| 9. A | 29. C |
| 10. B | 30. A |
| 11. C | 31. A |
| 12. B | 32. D |
| 13. D | 33. B |
| 14. A | 34. D |
| 15. A | 35. B |
| 16. B | 36. D |
| 17. C | 37. B |
| 18. C | 38. C |
| 19. A | 39. D |
| 20. A | 40. B |

MATHEMATICS

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|-------|-------|-------|-------|
| 1. C | 13. D | 25. A | 37. B |
| 2. A | 14. D | 26. D | 38. B |
| 3. C | 15. B | 27. B | 39. C |
| 4. B | 16. A | 28. C | 40. D |
| 5. A | 17. A | 29. D | |
| 6. D | 18. C | 30. B | |
| 7. D | 19. D | 31. C | |
| 8. A | 20. B | 32. A | |
| 9. C | 21. B | 33. B | |
| 10. C | 22. B | 34. D | |
| 11. A | 23. C | 35. B | |
| 12. D | 24. B | 36. D | |