



Max. Marks: 360

Date: 29.08.2022

PART TEST : PHYSICS
NEET 24

Topic: Projectile Motion

1. A ball is thrown at an angle θ with the horizontal. Its horizontal range is 60 m and time of flight is 3s. What is the horizontal component of its velocity of projection?
(a) 20 m/s (b) 30 m/s (c) 15 m/s (d) 10 m/s
2. The maximum vertical height to which a boy can throw a ball is 40 m. What is the maximum possible horizontal distance to which he can throw the ball ?
(a) 20 m (b) 40 m (c) 60 m (d) 80 m
3. A ball is projected with a velocity v making an angle θ with the horizontal. If its horizontal range is expressed as $R = \frac{\sqrt{3}v^2}{2g}$, what is the value of the angle of projection?
(a) 15° (b) 20° (c) 45° (d) 30°
4. For angles of projection of projectile at angles $(45^\circ - \theta)$ and $(45^\circ + \theta)$, the horizontal ranges described by the projectile are in the ratio of
(a) 1 : 1 (b) 1 : 2 (c) 2 : 1 (d) 2 : 3
5. A projectile is projected with initial velocity 6m/s in horizontal direction and 8m/s in vertical direction. If $g = 10 \text{ m/s}^2$, then the horizontal range is
(a) 9.6 m (b) 4.8 m (c) 19.2 m (d) 2.4 m

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6. For a body projected at angle of 45° to the horizontal, the horizontal range (R) and maximum height (H) are related as
(a) $R = 16H$ (b) $R = 8H$ (c) $R = 4H$ (d) $R = 2H$
7. Two projectiles A and B thrown with speeds in the ratio $1:\sqrt{2}$ acquired the same maximum heights. If A is thrown at an angle of 45° with the horizontal, the angle of projection of B will be
(a) 0° (b) 60° (c) 30° (d) 45°
8. A ball is projected with the same velocity but at different angles with the horizontal. For which angle of projection from the following the height reached by the ball is maximum ?
(a) 30° (b) 45° (c) 60° (d) 80°
9. A water fountain on the ground sprinkles water all around it. If the speed of water coming out of the fountain is v , the total maximum area around the fountain that gets wet is
(a) $\pi \frac{v^2}{g}$ (b) $\pi \frac{v^4}{g^2}$ (c) $\frac{\pi v^4}{2 g^2}$ (d) $\pi \frac{v^2}{g^2}$
10. A body is thrown with a velocity of 10 m/s making an angle of 30° with the horizontal. It will hit the ground after a time-
(a) 3 s (b) 2 s (c) 1.5 s (d) 1 s
11. The angle of projection of a body is 15° . The other angle for which the range is the same as the first one is equal to-
(a) 30° (b) 45° (c) 60° (d) 75°
12. If four balls A, B, C, D are projected with same speed at angles of 15° , 30° , 45° and 60° with the horizontal respectively, the two balls which will fall at the same place will be-
(a) A and B (b) A and D (c) B and D (d) A and C

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13. Two balls are projected from the same point in direction inclined at 60° and 30° to the horizontal. If they attain the same maximum height, what is the ratio of their velocities of projection ?
- (a) $1 : \sqrt{3}$ (b) $\sqrt{3} : 1$ (c) $1 : 1$ (d) $1 : 2$
14. A stone is projected with speed u at an angle q with the horizontal from a high tower and lands on ground. Then :
- (i) Range of stone = $\frac{u^2 \sin 2\theta}{g}$ (ii) Time of flight = $\frac{2u \sin \theta}{g}$
- Select correct one -
- (a) Only statement (i) is correct (b) Only statement (ii) is correct
- (c) Both (i) and (ii) are correct (d) Neither (i) nor (ii) is correct
15. Three particles, A , B and C are projected from the same point with same initial speeds making angles 30° , 45° and 60° respectively with the horizontal. Which of the following statement is correct ?
- (a) A, B and C have equal ranges
- (b) ranges of A and C are equal and less than that of B
- (c) ranges of A and C are equal and greater than that of B
- (d) A, B and C have equal ranges
16. A projectile thrown with a speed v at an angle q has a Height H on the surface of the earth. For same v and q , its height on the surface of moon will be- ($g_{\text{moon}} = g_{\text{earth}} / 6$)
- (a) $H/6$ (b) $6H$ (c) $H/36$ (d) $36H$
17. If a man wants to hit a target, he should point his rifle
- (a) higher than the target (b) lower than the target
- (c) in the direction of the target (d) nothing can be said

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18. The horizontal range covered by projectile is proportional to
- (a) its velocity (b) square of its velocity
(c) sine of the angle of projection (d) square of the sine of the angle of projection
19. The horizontal range for projectile is given by
- (a) $\frac{u^2 \sin^2 \theta}{g}$ (b) $\frac{u^2 \sin 2\theta}{g}$ (c) $\frac{u^2 \sin 2\theta}{2g}$ (d) $\frac{u^2 \cos 2\theta}{g}$
20. The maximum vertical height attained by a projectile is
- (a) $\frac{U^2 \sin \theta}{g}$ (b) $\frac{U^2 \sin 2\theta}{g}$ (c) $\frac{U^2 \sin 2\theta}{2g}$ (d) $\frac{U^2 \sin^2 \theta}{2g}$
21. A ball is thrown at an angle θ with the vertical. Its horizontal range is 60 m and time of flight is 3s. What is the horizontal component of its velocity of projection?
- (a) 20 m/s (b) 30 m/s (c) 15 m/s (d) 10 m/s
22. The maximum vertical height to which a boy can throw a ball is 40 m. What is the maximum possible horizontal distance to which he can throw the ball ?
- (a) 20 m (b) 40 m (c) 60 m (d) 80 m
23. A ball is projected with a velocity v making an angle θ with the horizontal. If its horizontal range is expressed as $R = v^2/2g$, what is the value of the angle of projection?
- (a) 15° (b) 20° (c) 45° (d) 30°
24. For angles of projection of projectile at angles $(25^\circ - \theta)$ and $(65^\circ + \theta)$, the horizontal ranges described by the projectile are in the ratio of
- (a) 1 : 1 (b) 1 : 2 (c) 2 : 1 (d) 2 : 3

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25. A projectile is projected with initial velocity 60m/s in horizontal direction and 80m/s in vertical direction. If $g = 10 \text{ m/s}^2$, then the horizontal range is
(a) 960 m (b) 480 m (c) 1920 m (d) 240 m
26. For a body projected at angle of 45° to the horizontal, the horizontal range (R) and maximum height (H) are related as
(a) $R = 16H$ (b) $R = 8H$ (c) $R = 4H$ (d) $R = 2H$
27. Two projectiles A and B thrown with speeds in the ratio $1:\sqrt{2}$ acquired the same maximum heights. If A is thrown at an angle of 45° with the horizontal, the angle of projection of B will be
(a) 0° (b) 60° (c) 30° (d) 45°
28. A ball is projected with the same velocity but at different angles with the horizontal. For which angle of projection from the following the height reached by the ball is maximum ?
(a) 30° (b) 45° (c) 60° (d) 65°
29. A ball is projected with the same velocity but at different angles with the horizontal. For which angle of projection from the following the range reached by the ball is maximum ?
(a) 30° (b) 40° (c) 55° (d) 65°
30. A body is thrown with a velocity of 40 m/s making an angle of 30° with the horizontal. It will hit the ground after a time
(a) 3 s (b) 2 s (c) 1.5 s (d) 4 s
31. The angle of projection of a body is 22.5° . The other angle for which the range is the same as the first one is equal to
(a) 30° (b) 77.5° (c) 62.5° (d) 67.5°

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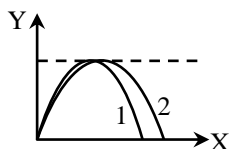


32. If four balls A, B, C, D are projected with same speed at angles of 15° , 20° , 55° and 70° with the horizontal respectively, the two balls which will fall at the same place will be
 (a) A and B (b) A and D (c) B and D (d) A and C
33. Two balls are projected from the same point in direction inclined at 60° and 30° to the horizontal. If they attain the same maximum height, what is the ratio of their time of flight?
 (a) $1 : \sqrt{3}$ (b) $\sqrt{3} : 1$ (c) $1 : 1$ (d) $1 : 2$
34. A body is projected at an angle θ with horizontal. Another body is projected with the same velocity at an angle θ with the vertical. The ratio of the range is-
 (a) $1:1$ (b) $\tan^2\theta : 1$ (c) $\tan\theta : 1$ (d) $\tan 2\theta : 1$
35. Three particles, A, B and C are projected from the same point with same initial speeds making angles 15° , 45° and 75° respectively with the horizontal. Which of the following statement is correct ?
 (a) A, B and C have equal ranges
 (b) ranges of A and C are equal and less than that of B
 (c) ranges of A and C are equal and greater than that of B
 (d) A, B and C have equal ranges
36. A projectile thrown with a speed v at an angle θ has a Height H on the surface of the earth. If the speed is doubled and angle θ is kept same, its height on the surface of moon will be- ($g_{\text{moon}} = g_{\text{earth}} / 6$)
 (a) $24H$ (b) $6H$ (c) $H/36$ (d) $36H$
37. If a man wants to hit a target, he should point his rifle
 (a) higher than the target (b) lower than the target
 (c) in the direction of the target (d) nothing can be said

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38. The time of flight covered by projectile is proportional to
- (a) its velocity (b) square of its velocity
(c) cosine of the angle of projection (d) square of the sine of the angle of projection
39. The vertical maximum height for projectile is given by
- (a) U^2/g (b) $U^2/2g$ (c) $2U^2/g$ (d) $U^2/4g$
40. The range attained by a projectile is
- (a) $\frac{U^2 \sin \theta}{g}$ (b) $\frac{U^2 \sin 2\theta}{g}$ (c) $\frac{U^2 \sin 2\theta}{2g}$ (d) $\frac{U^2 \sin^2 \theta}{2g}$
41. If a projectile thrown with a speed v at an angle 45° to the horizontal attains a maximum height of 62m, its range will be -
- (a) 31 m (b) 248 m (c) 124 m (d) 62 m
42. A body is projected at 30° angle with the horizontal with velocity 30 ms^{-1} . What is the angle with the horizontal after 1.5 s? (Take $g = 10 \text{ m s}^{-2}$)
- (a) 0° (b) 30° (c) 60° (d) 90°
43. Trajectories of two projectiles are shown in the figure. Let T_1 and T_2 be the time of flights and u_1 and u_2 be their speeds of projection. Then -



- (a) $T_2 > T_1$ (b) $T_1 > T_2$ (c) $u_1 > u_2$ (d) $u_1 < u_2$

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44. A body is projected at an angle of 30° with the horizontal with momentum p . At its highest point, the momentum is -
- (a) p (b) $\frac{p}{2}$ (c) $\frac{\sqrt{3}}{2} p$ (d) $\frac{2}{\sqrt{3}} p$
45. Two projectiles are thrown with the same initial velocity at angles α and $(90^\circ - \alpha)$ with the horizontal. The maximum heights attained by them are h_1 and h_2 respectively. Then $\frac{h_1}{h_2}$ is equal to -
- (a) $\sin^2 \alpha$ (b) $\cos^2 \alpha$ (c) $\tan^2 \alpha$ (d) 1

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CHEMISTRY: PART TEST

Topic: Gaseous State

46. Which property is kept constant in verification of Charles' law?
(a) Pressure (b) Volume (c) Temperature (d) Both (B) and (C)
47. Which of the following expression at constant pressure represents Charles' law for a given mass of gas?
(a) $V \propto \frac{1}{T}$ (b) $V \propto \frac{1}{T^2}$ (c) $V \propto T$ (d) $V \propto d$
48. At _____, the volume of a given mass of gas is double as compared to its volume at 0° C. Pressure is kept constant throughout.
(a) -273.15°C (b) 0°C (c) 100 °C (d) 273.15°C
49. The graph of pressure vs temperature according to Gay Lussac's law is _____.
(a) straight line parallel to X axis
(b) straight line parallel to Y axis
(c) straight line passing through origin
(d) straight line with negative slope
50. When the pressure of 5 L of N₂ is doubled and its temperature is raised from 300 K to 600 K, the final volume of the gas would be _____.
(a) 5 L (b) 10L (c) 15 L (d) 20 L
51. The volume occupied by 1 mole of a gas when pressure is 1 atm and temperature is 273.15 K is _____.
(a) 2.24 L (b) 22.4 L (c) 224 L (d) 22400 L

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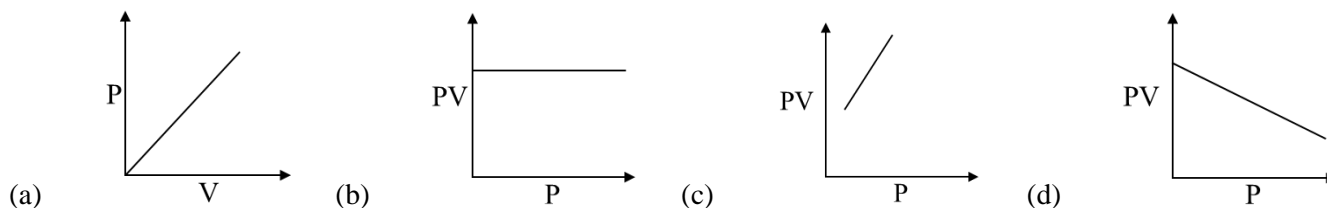


52. Which of the following law explains scuba diving ?
(a) Boyle's law (b) Charles'law (c) Gay Lussac's law (d) Avogadro law
53. Hot air balloons float in air because of the low density of the air inside the balloon. This can be explained with the help of _____.
(a) Boyle's law (b) Charles'law (c) Gay Lussac's law (d) Avogadro law
54. The pressure in the automobile tyres changes during hot summer or winter season. This can be explained with the help of _____.
(a) Boyle's law (b) Charles'law (c) Gay Lussac's law (d) Avogadro law
55. For n moles of an ideal gas, the ideal equation may be written as _____.
(a) $PT/n = RV$ (b) $PV = (RT)^2$ (c) $PV = nRT$ (d) $PV = RT/n$
56. Select the CORRECT statement. In the gas equation, $PV = nRT$, _____.
(a) n is the number of molecules of a gas
(b) V denotes volume of one mole of the gas
(c) n moles of the gas have a volume V
(d) P is the pressure of the gas when only one mole of gas is present.
57. For an ideal gas, number of moles per litre in terms of its pressure P, gas constant R and temperature T is _____.
(a) PT/R (b) PRT (c) P/RT (d) RT/P
58. CORRECT value of gas constant 'R' is _____.
(a) $8.21 \text{ cal K}^{-1} \text{ mol}^{-1}$ (b) $8.314 \text{ J K}^{-1} \text{ mol}^{-1}$
(c) $8.21 \text{ L atm K}^{-1} \text{ mol}^{-1}$ (d) $1.987 \text{ J K}^{-1} \text{ mol}^{-1}$

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59. When unit of pressure is atm and that of volume is dm^3 , then unit of R is _____
- (a) $\text{atm K dm}^{-3} \text{mol}^{-1}$ (b) $\text{atm dm}^3 \text{K}^{-1} \text{mol}^{-1}$
(c) $\text{atm K}^{-1} \text{mol}^{-1}$ (d) $\text{atm dm}^3 \text{K}^{-1}$
60. The temperature at which the volume and pressure of 28 g N_2 becomes 10 dm^3 and 2.46 atm respectively is _____
- (a) 273 K (b) 299.63 K (c) 373 K (d) 399.65 K
61. The total pressure of a mixture of two or more non-reactive gases is the _____ of the individual gases in the mixture.
- (a) sum of the partial pressures
(b) product of the partial pressures
(c) sum of the pure pressures
(d) product of the pure pressures
62. For a certain amount of an ideal gas at constant temperature, _____
- (a) volume always remains constant
(b) pressure always remains constant
(c) product of pressure and volume remains constant.
(d) the ratio of pressure and volume always remains constant.
63. Which of the following graphs represent Boyle's law?



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64. At what pressure will a quantity of a gas, which occupies 100 cm^3 at a pressure of 720 mm Hg , occupy a volume of 84 cm^3 ? [Temperature is constant throughout the process]
- (a) 736.18 mm Hg (b) 784.15 mm Hg (c) 820.20 mm Hg (d) 857.14 mm Hg
65. At constant temperature, a quantity of an ideal gas occupies 50 dm^3 at 0.5 atm pressure. At what volume, the pressure will be 0.25 atm ?
- (a) 100 dm^3 (b) 200 dm^3 (c) 25 dm^3 (d) 150 dm^3
66. If pressure becomes double at the same absolute temperature on 2 L CO_2 , then the volume of CO_2 becomes _____.
- (a) 2 L (b) 4 L (c) 25 L (d) 1 L
67. The volume of a given mass of a gas at 12°C is 2 dm^3 . The temperature at which the same gas has volume of 3.4 dm^3 is _____.
- (a) 200°C (b) 211.5°C (c) 200K (d) 211.5 K
68. A gas at 10°C occupies a volume of 283 dm^3 . If it is heated to 20°C , keeping the pressure constant, the new volume will be _____.
- (a) 283 dm^3 (b) 293 dm^3 (c) 566 dm^3 (d) 586 dm^3
69. At 300 K , a certain mass of a gas occupies $1 \times 10^{-4} \text{ dm}^3$ volume. Its volume at 450 K at the same pressure is _____.
- (a) $1 \times 10^{-4} \text{ dm}^3$ (b) $1.5 \times 10^{-4} \text{ dm}^3$ (c) $2 \times 10^{-4} \text{ dm}^3$ (d) $2.5 \times 10^{-4} \text{ dm}^3$
70. A certain sample of gas has a volume of 0.2 litre measured at 1 atm pressure and 0°C . At the same pressure but at 273°C , its volume will be _____.
- (a) 0.4 litres (b) 0.8 litres (c) 27.8 litres (d) 55.6 litres

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71. 400 cm^3 of oxygen gas at 27°C was cooled to -3°C without change in pressure. The contraction in volume will be _____.
(a) 30 cm^3 (b) 40 cm^3 (c) 44.4 cm^3 (d) 360 cm^3
72. At what temperature in the Celsius scale, V (volume) of a certain mass of a gas at 27°C will be doubled keeping the pressure constant ?
(a) 54°C (b) 327°C (c) 427°C (d) 527°C
73. At a constant pressure, what should be the percentage increase in the temperature in Kelvin for a 10% increase in volume of a given mass of a gas ?
(a) 5% (b) 10% (c) 20% (d) 50%
74. 10 g of gas at atmospheric pressure is cooled from 273°C to 0°C keeping the volume constant, its pressure would become _____.
(a) $\frac{1}{2} \text{ atm}$ (b) $\frac{1}{273} \text{ atm}$ (c) 2 atm (d) 273 atm
75. A vessel contains one mole of O_2 gas (molar mass 32) at a temperature T . The pressure of the gas is P . An identical vessel containing one mole of He gas (molar mass 4) at a temperature $2T$ has a pressure of _____.
(a) $P/8$ (b) P (c) $2P$ (d) $8P$
76. Which of the following represents the Avogadro number ?
(a) Number of molecules present in 1 L of a gas at S.T.P.
(b) Number of molecules present in 22.4 L of a gas at S.T.P.
(c) Number of molecules present in 1 dm^3 of a gas at 298 K and 1 atm.
(d) Number of molecules present in one mole of a gas at any temperature and pressure.

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77. Hydrogen and argon are kept in two separate but identical vessels at constant temperature and pressure, then which of the following is CORRECT?
- (a) Both contain same number of atoms.
(b) The number of atoms of argon is half than that of hydrogen
(c) The number of atoms of argon is double than that of hydrogen
(d) The number of atom of argon is $1/4^{\text{th}}$ than that of hydrogen.
78. Five grams each of the following gases at 87°C and 750 mm pressure are taken. Which of them will have the least volume ?
- (a) HF (b) HCl (c) HBr (d) HI
79. If the volume of 2 moles of an ideal gas at 540K is 44.8 litres then its pressure will be _____.
(a) 1 atmosphere (b) 2 atmosphere (c) 3 atmosphere (d) 4 atmosphere
80. 2 gm of O_2 at 27°C and 760 mm of Hg pressure has volume _____.
(a) 1.5 L (b) 2.8 L (c) 11.2 L (d) 22.4 L
81. 16 g of oxygen and 3 g of hydrogen are mixed and kept at 760 mm of Hg pressure and 0°C . The total volume occupied by the mixture will be nearly _____.
(a) 22.4 litres (b) 33.6 litres (c) 448 litres (d) 44800 mL
82. In an experiment during the analysis of a carbon compound, 145 L of H_2 was collected at 760 mm of Hg pressure and 27°C temperature. The mass of H_2 is near _____.
(a) 6 g (b) 10 g (c) 12 g (d) 24 g
83. Densities of two gases are in the ratio 1:2 and their temperatures are in the ratio 2:1, then the ratio of their respective pressure is _____.
(a) 1:1 (b) 1:2 (c) 2:1 (d) 4:1

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84. The density of a gas at 27°C and 1 atm is d . Pressure remaining constant at which of the following temperature will its density become $0.75d$?
- (a) 20°C (b) 30°C (c) 400 K (d) 300K
85. Containers A and B have same gases. Pressure, volume and temperature of A are all twice that of B, then the ratio of number of molecules of A and B are _____
- (a) 1 : 2 (b) 2 : 1 (c) 1 : 4 (d) 4 : 1
86. If the absolute temperature of a gas is doubled and the pressure is reduced to one-half, the volume of the gas will _____.
- (a) remain unchanged (b) be doubled
(c) increase four-fold (d) be reduced to $1/4^{\text{th}}$
87. If the pressure and absolute temperature of 2 litres of CO_2 are doubled, the volume of CO_2 would become _____
- (a) 2 litres (b) 4 litres (c) 5 litres (d) 7 litres
88. Among the following conditions of temperature and pressure, the density of neon will be highest at _____.
- (a) S.T.P (b) 0°C , 2 atm (c) 273°C , 1 atm (d) 273°C , 2 atm
89. At what temperature, the sample of neon gas would be heated to double of its pressure, if the initial volume of gas is reduced by 15% at 75°C .
- (a) 60°C (b) 128°C (c) 319°C (d) 592°C
90. A mixture of 28 g N_2 and 16 g He has 25 bar pressure. The partial pressure of N_2 in the mixture is _____
- (a) 20 (b) 15 (c) 10 (d) 5

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Max. Marks: 360

Date: 29.08.2022

PART TEST: PHYSICS
NEET 24 ANSWER KEY
Topic: Projectile Motion

1.	(a)	2.	(d)	3.	(d)	4.	(a)	5.	(a)
6.	(c)	7.	(c)	8.	(d)	9.	(b)	10.	(d)
11.	(d)	12.	(c)	13.	(a)	14.	(d)	15.	(b)
16.	(b)	17.	(a)	18.	(b)	19.	(b)	20.	(d)
21.	(a)	22.	(d)	23.	(a)	24.	(a)	25.	(a)
26.	(c)	27.	(c)	28.	(d)	29.	(b)	30.	(d)
31.	(d)	32.	(c)	33.	(c)	34.	(a)	35.	(b)
36.	(a)	37.	(a)	38.	(a)	39.	(b)	40.	(b)
41.	(b)	42.	(a)	43.	(d)	44.	(c)	45.	(c)

CHEMISTRY: PART TEST ANSWER KEY
Topic: Gaseous State

46.	(a)	47.	(c)	48.	(d)	49.	(c)	50.	(a)
51.	(b)	52.	(a)	53.	(b)	54.	(c)	55.	(c)
56.	(c)	57.	(c)	58.	(b)	59.	(b)	60.	(b)
61.	(a)	62.	(c)	63.	(b)	64.	(d)	65.	(a)
66.	(d)	67.	(b)	68.	(b)	69.	(b)	70.	(a)
71.	(b)	72.	(b)	73.	(b)	74.	(a)	75.	(c)
76.	(b)	77.	(b)	78.	(d)	79.	(b)	80.	(a)
81.	(d)	82.	(c)	83.	(a)	84.	(c)	85.	(b)
86.	(c)	87.	(a)	88.	(b)	89.	(c)	90.	(d)