



SET-A

QUANTUM POTENTIAL TEST

[Quality Nurturer & Mind Utilizer Test for Potential Enhancement]

(IPEC Scholarship-Cum-Admission Test)

For

CLASS-IX

(For IX to X Moving Students)

Time : 3 Hrs.]

[Maximum Marks : 270

[PAPER-2]

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

INSTRUCTIONS

1. The booklet is your Question Paper. Do not break the seal of this booklet before being instructed to do so by the invigilator.
2. Blank spaces and blank pages are provided in the question paper for your rough work. No additional sheets will be provided for rough work.
3. Blank papers, clipboards, log tables, slide rules, calculators, cameras, cellular phones, pagers and electronic gadgets are **NOT** allowed inside the examination hall.
4. The answer sheet, a machine-readable Optical Response Sheet (**ORS**), is provided separately.
5. On breaking the seal of the booklet check that it contains **1** pages and all the **75** questions.
6. A candidate has to write his / her answers in the ORS sheet by darkening the appropriate bubble with the help of **Black ball point pen** as the correct answer of the question attempted.
7. **Question Paper Format :**

This question paper consists of **Four Parts:**

Part-I: (Physics) - 20 Questions.

Part-II: (Chemistry) - 20 Questions.

Part-III: (Mathematics) - 20 Questions.

Part-IV: (Biology) - 15 Questions.

8. **Marking Scheme :**

Please see the marking scheme as mentioned in all sections and comprehensions.

FOR ANSWER KEY VISIT OUR WEBSITE- www.ipeeciit.com

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PART -I [Physics]

[SECTION - I]

[SINGLE CORRECT TYPE]

This section contains 5 Multiple Choice Questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

[Marking Scheme: +3 marks for correct answer and -1 for wrong answer]

- A body of mass m kg starts from rest and travels a distance of s m in t seconds. The force acting on it is
 (A) $\frac{2ms}{t^2}$ N (B) $\frac{ms}{t}$ N (C) $\frac{ms^2}{2t}$ N (D) $\frac{ms^2}{t}$ N
- A gun of mass 1 kg fires 4 bullets per sec each of mass 20 g with a velocity 300ms^{-1} . The force required to hold the gun is
 (A) 24 N (B) 28 N (C) 32 N (D) 10 N
- If the radius of the earth were to be increased by a factor of 3, by what factor would its density have to be changed to keep g the same?
 (A) 3 (B) $\frac{1}{3}$ (C) 6 (D) $\frac{1}{6}$
- Suppose we have taken a stone to the centre of the earth
 (A) its weight becomes zero (B) its weight increases
 (C) its weight is unaffected (D) its mass increases
- An iron block was weighed at equator and its value was found to be 1 N. When the same iron block is weighed at poles, its value is found to be x N. Then
 (A) $1 = x$ (B) $1 > x$ (C) $x > 1$ (D) can't say

[SECTION - II]

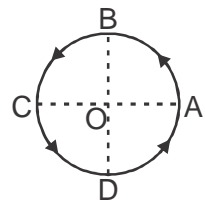
[COMPREHENSION TYPE]

This section contains 6 comprehension (15 Multiple Choice Questions). Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

[Marking Scheme: +4 marks for correct answer and -1 for wrong answer]

Comprehension#1

Distance travelled by an object in a given time is the actual path length covered by an object in the given time and displacement is the shortest distance between the initial and final position of the object in the given time. Speed is equal to distance/time and velocity = displacement/time. Change in velocity = final velocity - initial velocity. A particle moves along a circle of radius R . It starts from point A and moves in anticlockwise direction, as shown in figure.



(Space for rough work)

6. The distance travelled and displacement of the particle from A to B is
- (A) $\frac{\pi R}{4}, R$ (B) $\frac{\pi R}{2}, 2R$ (C) $\frac{\pi R}{4}, \sqrt{2}R$ (D) $\frac{\pi R}{2}, \sqrt{2}R$
7. The distance travelled and displacement of the particle from A to C is
- (A) $\frac{\pi R}{2}, 2R$ (B) $\pi R, 2R$ (C) $\frac{\pi R}{2}, \frac{\pi R}{2}$ (D) $\pi R, \pi R$
8. If T is the time period of uniform revolution of the particle on the circle, then the speed of the object at B is
- (A) $\frac{2\pi}{2T}$ (B) $\frac{\sqrt{2}R}{T}$ (C) $\frac{2\pi R}{T}$ (D) $\frac{R}{T}$

Comprehension#2

A body of mass 100 kg accelerated uniformly from a velocity of 5 ms^{-1} to 10 ms^{-1} in 5 s.

9. The initial momentum of the body
- (A) 250 kg ms^{-1} (B) 350 kg ms^{-1} (C) 300 kg ms^{-1} (D) 500 kg ms^{-1}
10. The final momentum of body
- (A) 1000 kg ms^{-1} (B) 500 kg ms^{-1} (C) 700 kg ms^{-1} (D) 900 kg ms^{-1}
11. The force acting on the body
- (A) 200 N (B) 100 N (C) 300 N (D) 400 N

Comprehension#3

An object of mass 1.5 kg travelling in a straight line with a velocity of 5 ms^{-1} collides with a wooden block of mass 5 kg resting on the floor. This object sticks with wooden block after collision and both move together in a straight line.

12. The total momentum before collision
- (A) 7.5 kgms^{-1} (B) 2.5 kgms^{-1} (C) 4.5 kgms^{-1} (D) 5.5 kgms^{-1}
13. The total momentum after collision
- (A) 3.5 kgms^{-1} (B) 1.5 kgms^{-1} (C) 7.5 kgms^{-1} (D) 2 kgms^{-1}
14. The velocity of the combination of these objects after collision
- (A) 8.5 ms^{-1} (B) 9.5 ms^{-1} (C) 1.15 ms^{-1} (D) 1.5 ms^{-1}

(Space for rough work)

Comprehension#4

Average speed is defined as the ratio of total distance travelled and total time taken and average velocity is defined as the ratio of total displacement travelled and total time taken.

15. A boy runs for 10 min at a uniform speed of 9 km/h. At what speed should he run for the next 20 min so that the average speed comes to 12 km/h?
(A) 12 km/hr (B) 13.5 km/hr (C) 15 km/hr (D) 9 km/hr
16. A man walks on a straight road from his home to market 2.5 km away with a speed of 5 km/h. Finding the market closed, he instantly turns and walks back home with a speed of 7.5 km/h. The average speed of the man over the interval of time 0 to 40 min is equal to
(A) 5 km/hr (B) $25/4$ km/hr (C) $30/4$ km/hr (D) $45/8$ km/hr

Comprehension#5

There is no atmosphere on the moon. This is because gas molecules need a certain amount of force of attraction to be retained on a heavenly body. The force of attraction of the moon is less than the required force, hence no atmosphere can exist.

17. The value of g on moon is time that of earth
(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{5}$ (D) $\frac{1}{6}$
18. If the weight of an object is 60 kg on earth then, its weight on moon is
(A) 10 kg (B) 20 kg (C) 30 kg (D) 40 kg

Comprehension#6

Two cars, A and B, travel in a straight line. The distance of A from the starting point is given as a function of time by $x_A(t) = \alpha t + \beta t^2$, with $\alpha = 2.60$ m/s and $\beta = 1.20$ m/s². The distance of B from the starting point is $x_B(t) = \gamma t^2 - \delta t^3$, with $\gamma = 2.80$ m/s² and $\delta = 0.20$ m/s³.

19. Which car is ahead just after they leave the starting point?
(A) Car A moves ahead (B) Car B moves ahead
(C) Car A and B moves simultaneously (D) Data is insufficient to decide
20. At what time(s) are the cars at the same point?
(A) 2.27 s (B) 5.73 s
(C) 2.6 s (D) Both 2.27 and 5.73 s

(Space for rough work)

PART -II [Chemistry]

[SECTION - I]

[SINGLE CORRECT TYPE]

This section contains 5 Multiple Choice Questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

[Marking Scheme: +3 marks for correct answer and -1 for wrong answer]

-
21. Brass contains
(A) gold and copper (B) copper and zinc (C) zinc and silver (D) copper and silver
22. Separation of petroleum into its components is done by
(A) Chromatography (B) sublimation (C) distillation (D) fractional distillation
23. Smoke is an example of
(A) gas dispersed in liquid (B) gas dispersed in solid
(C) solid dispersed in gas (D) solid dispersed in solid
24. A gas can be best liquefied
(A) by increasing the temperature
(B) by lowering the pressure
(C) by increasing the pressure and reducing the temperature
(D) none of these is correct
25. Which of the following statements does not go with the liquid state?
(A) Particles are loosely packed in the liquid state.
(B) Fluidity is maximum in the liquid state.
(C) Liquids cannot be compressed much
(D) Liquids take up the shape of any container in which they are placed.

[SECTION - II]

[COMPREHENSION TYPE]

This section contains 6 comprehension (15 Multiple Choice Questions). Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

[Marking Scheme: +4 marks for correct answer and -1 for wrong answer]

Comprehension#1

The pressure exerted by air is called atmospheric pressure. The pressure is generally measured in atmospheres. The atmospheric pressure at sea level is 1 atmosphere and is taken as normal atmospheric pressure.

$$1 \text{ atm} = 760 \text{ mm of Hg} = 76 \text{ cm of mercury}$$

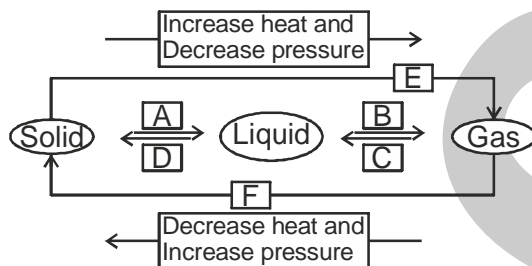
At a depth of 33 ft below the sea level, an additional 1 atm pressure is exerted by water. Other units of pressure are torr and bar. S.I. unit of pressure is pascal (Pa). ($1 \text{ atm} = 1.01 \times 10^5 \text{ Pa}$)

(Space for rough work)

26. When we blow air into a balloon, it inflates because
 (A) air particles diffuse in balloon
 (B) air particles collide with walls of balloon and exert pressure on them
 (C) rubber is elastic in nature
 (D) the temperature of air in the balloon becomes high.
27. At a depth of 100 ft below sea level what is the value of total pressure experienced by a diver?
 (A) 1 atm (B) 2 atm (C) 3 atm (D) 4 atm
28. A pressure of 1520 mm of mercury is equal to
 (A) 1.5 atm (B) 2 atm (C) 1 atm (D) 2.5 atm

Comprehension#2

A, B, C, D, E and F in the following diagram showing change in its state.



29. Process A is
 (A) Vaporization (B) Sublimation (C) Solidification (D) fusion or melting
30. Process E is
 (A) Vaporization (B) Sublimation (C) Solidification (D) fusion or melting
31. Process F is
 (A) Vaporization (B) Sublimation (C) Solidification (D) fusion or melting

Comprehension#3

Pure substances can be elements or compounds. An element is a form of matter which cannot be broken down by chemical reactions into simpler substances. A compound is a substance composed of two or more different types of elements, chemically combined in a fixed proportion. Properties of a compound are different from its constituent elements, whereas a mixture shows the properties of its constituting elements or compounds.

32. Which of the following is not a pure substance?
 (A) Tin (B) Coal (C) Ice (D) Lime stone

(Space for rough work)

33. The substance formed by mixing, crushing and heating iron filings and sulphur powder is
(A) an element (B) a compound (C) a mixture (D) a solution
34. Lustre, ductility, malleability, conductivity are properties of
(A) metals (B) non-metals (C) metalloids (D) compounds

Comprehension#4

Pragya tested the solubility of three different substances at different temperatures and collected the data as given below (results are given in the following table, as grams of substance dissolved in 100 grams of water to form a saturated solution).

Substance Dissolved	Temperature in K				
	283	293	313	333	353
Potassium nitrate	21	32	62	106	167
Sodium chloride	36	36	36	37	37
Potassium chloride	35	35	40	46	54
Ammonium chloride	24	37	41	55	66

35. What mass of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 50 grams of water at 313K?
(A) 11 gm (B) 21 gm (C) 31 gm (D) 41 gm
36. What is the effect of change of temperature on the solubility of potassium nitrate?
(A) increases (B) decreases (C) constant (D) can't predict

Comprehension#5

A solution contains 40 g of common salt in 320 g of water.

37. Mass by mass percentage of the solute is
(A) 11.1% (B) 21.1% (C) 31.1% (D) 41.1%
38. Mass by mass percentage of the solvent is
(A) 68.9% (B) 78.9% (C) 88.9% (D) 98.9%

(Space for rough work)

Comprehension#6

Pressure = 1 atm
 = 760 mm of Hg
 = 76 cm of Hg
 = 760 torr
 = 1.013×10^5 N/m² or Pascal (Pa)
 = 1.013×10^6 dyne/cm²
 = 1.013 bar
 1 bar = 10^5 Pa

39. A pressure of 228 cm Hg is equivalent to x atmosphere. The value of x is
 (A) 1 atm (B) 3 atm (C) 5 atm (D) 7 atm
40. Which of these choices is defined as "Standard pressure"?
 (A) 1.013 bar (B) 1 atm (C) 760 torr (D) All of these

PART -III [Mathematics]

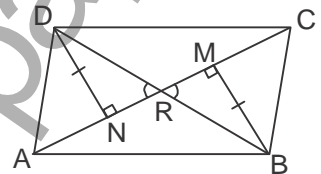
[SECTION - I]

[SINGLE CORRECT TYPE]

This section contains 5 Multiple Choice Questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

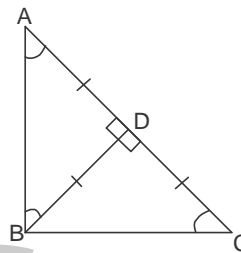
[Marking Scheme: +3 marks for correct answer and -1 for wrong answer]

41. In quadrilateral ABCD, BM and DN are drawn perpendicular to AC such that $BM = DN$. If $BR = 8\text{cm}$, then BD is
 (A) 4 cm (B) 2 cm
 (C) 12 cm (D) 16 cm
42. The length of the sides forming right angle of a right angled triangle are $5x\text{ cm}$ and $(3x - 1)\text{ cm}$. If the area of the triangle is 60cm^2 , find its hypotenuse.
 (A) 17 cm (B) 18 cm (C) 19 cm (D) 16 cm
43. The perimeter of the isosceles triangle is 60cm and its base is 415cm. The area of the triangle is
 (A) 160.75cm^2 (B) 159.07cm^2 (C) 156.75cm^2 (D) 195.72cm^2
44. The lengths of the sides of a triangle are 5cm, 12cm and 13cm. Find the lengths of perpendicular from the opposite vertex to the side whose length is 13cm
 (A) $\frac{13}{60}\text{cm}$ (B) $\frac{60}{13}\text{cm}$ (C) $\frac{17}{60}\text{cm}$ (D) $\frac{60}{17}\text{cm}$



(Space for rough work)

45. In the given figure $BD \perp AC$, the measure of $\angle ABC$ is
 (A) 60°
 (B) 30°
 (C) 45°
 (D) 90°



[SECTION - II]

[COMPREHENSION TYPE]

This section contains 6 comprehension (15 Multiple Choice Questions). Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

[Marking Scheme: +4 marks for correct answer and -1 for wrong answer]

Comprehension#1

$(\sqrt{x} + \sqrt{y})^2 = x + y + 2\sqrt{xy}$ and $\sqrt{x}\sqrt{y} = \sqrt{xy}$, where x and y are positive real numbers.

46. If $x = 2\sqrt{5} + \sqrt{3}$ and $y = 2\sqrt{5} - \sqrt{3}$, then $x^4 + y^4 =$
 (A) 1538 (B) 1200 (C) 1048 (D) 149
47. If $x = \sqrt{3} + 3\sqrt{2}$ and $y = \sqrt{3} - 3\sqrt{2}$, then $x^4 + y^4 - 8x^2y^2 =$
 (A) 3914 (B) 3010 (C) -486 (D) -856
48. If $a = 1 + \sqrt{2} + \sqrt{3}$ and $b = 1 + \sqrt{2} - \sqrt{3}$, then $a^2 + b^2 - 2a - 2b =$
 (A) 11 (B) 8 (C) 152 (D) 15

Comprehension#2

For a polynomial $p(x)$ of degree ≥ 1 , $p(a) = 0$, where a is a real number, then $(x - a)$ is a factor of the polynomial $p(x)$.

49. $p(x) = x^3 - 3x^2 + 4x - 12$, then $p(3) =$
 (A) 0 (B) 1 (C) -1 (D) 2
50. For what value of k , the polynomial $2x^4 + 3x^3 + 2kx^2 + 3x + 6$ is exactly divisible by $(x + 2)$?
 (A) 0 (B) -1 (C) 1 (D) 2
51. Find the value of k if $x - 1$ is a factor of $4x^3 + 3x^2 - 4x + k$.
 (A) 0 (B) 1 (C) -3 (D) 2

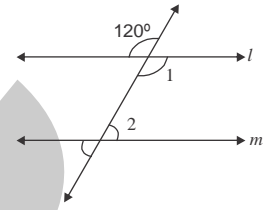
(Space for rough work)

Comprehension#3

If a transversal intersects two lines in such a way that a pair of alternate interior angles are equal, or each pair of co-interior angles are supplementary then the two lines are parallel.

52. From the given figure for what value of $\angle 2$ if $l \parallel m$.

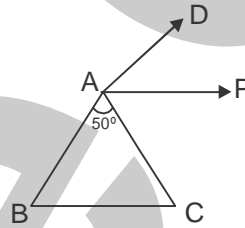
- (A) 120°
 (B) 180°
 (C) 60°
 (D) 100°



53. In the given figure, ABC is an isosceles triangle with $AB = AC$ and $AP \parallel BC$, $\angle BAC = 50^\circ$. Find

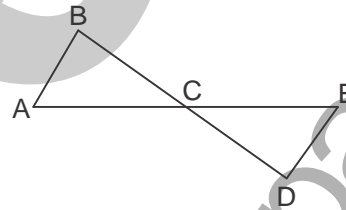
$\angle DAP$

- (A) 50°
 (B) 60°
 (C) 65°
 (D) 70°



54. In the given figure $AB \parallel DE$. If $\angle B = 45^\circ$ and $\angle DEC = 75^\circ$. Find $\angle ACD$.

- (A) 60°
 (B) 90°
 (C) 150°
 (D) 120°



Comprehension#4

If one end point of a line segment is the origin and other end point is (x, y) . The distance between end points of the line segment = $\sqrt{x^2 + y^2}$.

55. Which of the following points is not 10 units from the origin ?

- (A) $(-6, 8)$ (B) $(8, -6)$ (C) $(-6, -8)$ (D) $(6, 4)$

56. Which of the following points is the nearest to the origin ?

- (A) $(0, -6)$ (B) $(-8, 0)$ (C) $(-3, -4)$ (D) $(7, 0)$

(Space for rough work)

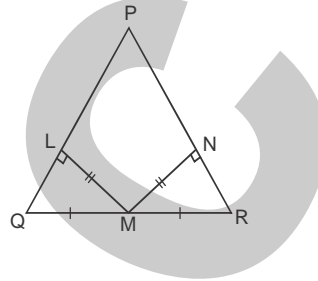
Comprehension#5

If in two right triangle, the hypotenuse and one side of one triangle is equal to the hypotenuse and one side of the other triangle, then the two triangles are congruent.

57. If the altitude from two vertices of a triangle to the opposite sides are equal, then the triangle is
 (A) isosceles (B) scalene (C) right-angled (D) equilateral

58. In the figure, it is given that $LM = MN$, $QM = MR$, $ML \perp PQ$ and $MN \perp PR$. Then

- (A) $PQ < PR$
 (B) $PQ > PR$
 (C) $PQ = PR$
 (D) None of these

**Comprehension#6**

By Heron's formula, the area of triangle is given by $\sqrt{s(s-a)(s-b)(s-c)}$, where $s = \frac{a+b+c}{2}$

59. Find the area of the parallelogram ABCD when $AB = 15\text{cm}$, $BC = 28\text{cm}$ and $AC = 41\text{cm}$.

- (A) 216cm^2 (B) 182cm^2 (C) 128cm^2 (D) 252cm^2

60. The sides of a triangle are 20 m, 16m and 10m. The area of the triangle is

- (A) 67.82m^2 (B) 82.92m^2 (C) 78.96m^2 (D) 79.24m^2

(Space for rough work)

PART -IV [Biology]

[SINGLE CORRECT TYPE]

This section contains 15 Multiple Choice Questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

[Marking Scheme: +3 marks for correct answer and -1 for wrong answer]

61. When xylem & phloem are present on separate radius, it is known as
(A) Conjoint (B) Radial (C) Collateral (D) Concentric
62. Wood is the name given to
(A) Phloem (B) Xylem (C) Parenchyma (D) Sclerids
63. Cambium is the
(A) Primary Meristem (B) Secondary Meristem
(C) Permanent tissue (D) None
64. One of the following is the food factory of plant
(A) ER (B) Mitochondria (C) Chloroplast (D) Golgi body
65. Who discovered Nucleus
(A) Robert Brown (B) Robert Hooke (C) Fontana (D) Palade
66. Following is a connective tissue
(A) Ligament (B) Tendon (C) Both (D) None
67. Goblet cells are seen in
(A) Glandular Epithelium (B) Ciliated Epithelium
(C) Sensory Epithelium (D) Cuboidal Epithelium
68. Dictyosome is the name given to Golgi body of
(A) Animal cell (B) Plant cell (C) Bacterial cell (D) Viral cell
69. Identify the Kharif crop
(A) Barley (B) Mustard (C) Rice (D) Wheat
70. Oxyosomes are seen in
(A) Plastid (B) Mitochondria (C) Lysosome (D) Golgi body
71. One of the following is known as suicidal bag
(A) Chloroplast (B) Mitochondria (C) Lysosome (D) Ribosome
72. Who proposed cell theory
(A) Lader & Tatum (B) Schleiden & Schwann (C) Porter (D) De Duve
73. Which is the kitchen of the cell
(A) Lysosome (B) Ribosome (C) ER (D) Chloroplast
74. Irrigation is required during
(A) Sowing (B) Harvesting (C) Weeding (D) Manuring
75. Hybrid varieties of crops
(A) give good yield (B) are disease resistant
(C) require no pesticides (D) are disease resistant & give good yield

(Space for rough work)



SET-A

QUANTUM POTENTIAL TEST

[Quality Nurturer & Mind Utilizer Test for Potential Enhancement]

(IPEC Scholarship-Cum-Admission Test)

For

CLASS-IX

(For IX to X Moving Students)

Time : 3 Hrs.]

[Maximum Marks : 270

[PAPER-2]

(SAMPLE PAPER) ANSWER KEY

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (A) | 2. (A) | 3. (B) | 4. (A) | 5. (C) |
| 6. (D) | 7. (B) | 8. (C) | 9. (D) | 10. (A) |
| 11. (B) | 12. (A) | 13. (C) | 14. (C) | 15. (B) |
| 16. (D) | 17. (D) | 18. (A) | 19. (A) | 20. (D) |
| 21. (B) | 22. (D) | 23. (C) | 24. (C) | 25. (B) |
| 26. (B) | 27. (D) | 28. (B) | 29. (D) | 30. (B) |
| 31. (B) | 32. (B) | 33. (B) | 34. (A) | 35. (C) |
| 36. (A) | 37. (A) | 38. (C) | 39. (B) | 40. (D) |
| 41. (D) | 42. (A) | 43. (B) | 44. (B) | 45. (D) |
| 46. (A) | 47. (C) | 48. (B) | 49. (A) | 50. (B) |
| 51. (C) | 52. (C) | 53. (C) | 54. (D) | 55. (D) |
| 56. (C) | 57. (A) | 58. (C) | 59. (D) | 60. (D) |
| 61. (B) | 62. (B) | 63. (B) | 64. (C) | 65. (A) |
| 66. (C) | 67. (A) | 68. (B) | 69. (C) | 70. (B) |
| 71. (C) | 72. (B) | 73. (B) | 74. (D) | 75. (D) |