



SET-A

IPEC EXPLOSIVE MIND TEST

SAMPLE PAPER

CLASS-IX

(For IX to X Moving Students)

Time : 3 Hrs.

Maximum Marks : 284

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 **14** pages and all the **80** 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 **4 Parts**. **Part-I: IQ** (Mental Ability), **Part-II: Mathematics** **Part - III** Physics and **Part-IV: Chemistry**

Part -I (IQ): **Section - I** Contains 12 Single choice questions(SCQ) from 1 to 18,
Section - II Contains 4 Comprehensions of 3 questions each from 19 to 30

Part -II : (Maths) Contains 3 Comprehensions and 16 Single correct type questions. Comprehensions -1 & 2 comprise of 3 questions each from 31 to 33 & from 34 to 36 and Comprehension 3 comprises of 4 questions from 37 to 40. Single Correct Type questions 41 to 56.

Part -III : (Physics) Contains 12 Single Correct type questions(SCQ) from 57 to 68.

Part -IV : (Chemistry) Contains 12 Single Correct type questions(SCQ) from 69 to 80.

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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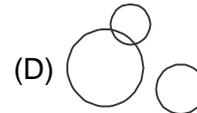
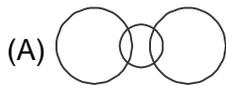
PART -I [10]

SECTION-I

[SINGLE CORRECT TYPE]

Each question has four choices (A), (B), (C) and (D) out of which only one is correct. You will be awarded +2 marks for correct answer. No negative mark will be awarded for wrong answer.

1. Bread is related to wheat in the same way as Brick is related to?
(A) Clay (B) Fire (C) Cement (D) Building
2. Win is related to competition in the same way as Invention is related to?
(A) Product (B) Discovery (C) Trial (D) Laboratory
3. Transistor is related to Radio in the same way as Television is related to?
(A) Entertainment (B) Cinema (C) Video (D) Cassette
4. Man is related to Arms in the same way as cockroach is related to?
(A) Wings (B) Pseudopodia (C) Legs (D) Antennae
5. If animals that live on land and the animals that live in water are represented by two big circles and animals that live both in water and on land are represented by a small circle, the combination of these three can be best represented as



6. Ravi wants to go to the university. He starts from his home which is in the East and comes to a crossing. The road to the left ends in a theatre, straight ahead is the hospital. In which direction is the university ?
(A) North (B) South (C) East (D) West

Directions (Questions 7 to 10) :

In each of the following questions, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and replace the question mark in the given series.

7. 6, 17, 39, 72, ?
(A) 83 (B) 94 (C) 116 (D) 127
8. 325, 259, 204, 160, 127, 105, ?
(A) 94 (B) 96 (C) 98 (D) 100
9. 4, 9, 25, ?, 121, 169, 289, 361
(A) 49 (B) 64 (C) 81 (D) 87
10. 1, 9, 25, 49, 81, ?
(A) 100 (B) 112 (C) 144 (D) 121

(Space for rough work)

Directions (Questions 11 to 14) :

In each of the following questions, one term in the number series is wrong. Find out the wrong term.

11. 105, 85, 60, 30, 0, -45, -90
 (A) 105 (B) 60 (C) 0 (D) -45
12. 325, 259, 202, 160, 127, 105, 94
 (A) 94 (B) 127 (C) 259 (D) 202
13. 380, 188, 92, 48, 20, 8, 2
 (A) 48 (B) 8 (C) 20 (D) 188
14. 89, 78, 86, 80, 85, 82, 83
 (A) 83 (B) 86 (C) 82 (D) 78

Directions (Questions 15 to 18) :

In each of the following letter series, some of the letters are missing which are given in that order as one of the alternatives below it. Choose the correct alternative.

15. ___ op ___ mo ___ n ___ ___ pnmop ___
 (A) mnpmon (B) mpnmop (C) mnompn (D) mnpomn
16. ___ nmmn ___ mmnn ___ mnnm ___
 (A) nmmn (B) mnnm (C) nnmm (D) nmnm
17. ___ tu ___ rt ___ s ___ ___ usrtu ___
 (A) rtusru (B) rsutr (C) rsurtr (D) rsurts
18. ba ___ cb ___ b ___ bab ___
 (A) acbb (B) bacc (C) bcaa (D) cabb

Directions (Questions 19 to 21):

Read the following information carefully and answer the questions given below :

Six persons A, B, C, D, E and F are sitting in two rows, three in each.

E is not at the end of any row.

D is second to the left of F.

C, the neighbour of E, is sitting diagonally opposite to D.

B is the neighbour of F.

19. Which of the following are sitting diagonally opposite to each other ?
 (A) F and C (B) D and A (C) A and C (D) A and F
20. Which of the following are in the same row ?
 (A) A and E (B) E and D (C) C and B (D) A and B
21. Which of the following are in one of the two rows ?
 (A) FBC (B) CEB (C) DBF (D) AEF

(Space for rough work)

Directions (Questions 22 to 24) :

Study the given information carefully and answer the questions that follow :

- (i) A, B, C, D, E, F and G are sitting on a wall and all of them are facing east.
- (ii) C is on the immediate right of D.
- (iii) B is at an extreme end and has E as his neighbour
- (iv) G is between E and F.
- (v) D is sitting third from the south end.

22. Who is sitting to the right of E ?

- (A) A (B) C (C) D (D) None of these

23. Which of the following pairs of people are sitting at the extreme ends ?

- (A) AB (B) AE (C) CB (D) FB

24. Name of person who should change place with C such that he gets the third place from the north end.

- (A) E (B) F (C) G (D) D

Directions (Questions 25 to 27) :

Read the following information carefully and answer the questions given below it :

In a car exhibition, seven cars of seven different companies viz. Cardilac, Ambassador, Fiat, Maruti, mercedes, Bedford and Fargo were displayed in a row, facing east such that;

- (1) Cardilac car was to the immediate right of fargo.
- (2) Fargo was fourth to the right of Fiat.
- (3) Maruti car was between Ambassador and Bedford.
- (4) Fiat, which was third to the left of Ambassador car, was at one of the ends.

25. Which of the following was the correct position of the Mercedes ?

- (A) Immediate right of Cardilac (B) Immediate left of Bedford
(C) Between Bedford and Fargo (D) Fourth to the right of Maruti

26. Which of the following is definitely true ?

- (A) Fargo car is between Ambassador and Fiat.
(B) Cardilac car is to the immediate left of Mercedes.
(C) maruti is fourth to the right of Mercedes .
(D) None of these

27. Which cars are on the immediate either sides of the cardilac car ?

- (A) Ambassador and Maruti (B) Maruti and Fiat
(C) Fiat and Mercedes (D) None of these

(Space for rough work)

Directions (Questions 28 to 30) :

Study the following information carefully and answer these questions:

A, B, C, E, F, G and H are seven employees in an organisation working in the departments of Administration, Accounts and Operations. There are atleast two employees in each department. There are three females, one in each department. Each of the seven employees earns different amount. F works in Administration and his only other colleague G earns the maximum. C, the least earner, works in Accounts. B and E are brothers and do not work in the same department. A, husband of H, works in Accounts and earns more than each of F, B and E. The wife in the couple earns more than the husband.

28. Which of the following is a group of females ?
(A) GCE (B) GEH (C) GCH (D) None of these
29. In which department do three people work ?
(A) Operations (B) Accounts
(C) Operations or Accounts (D) None of these
30. What will be the position of A from the top when they are arranged in descending order of their incomes ?
(A) Second (B) Third (C) Fourth (D) Fifth

(Space for rough work)

PART -II [Mathematics]

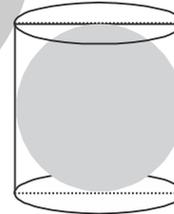
[COMPREHENSION TYPE]

This Part contains 3 Comprehensions. Comprehensions 1 & 2 comprise of 3 single choice questions each & Comprehension 3 comprises of 4 single choice questions. Each question has four choices (A), (B), (C) and (D) out of which only one is correct.

- Comprehension#1** - You will be awarded **+6 marks** for correct answer and **-1 Mark** for wrong answer
Comprehension#2 - You will be awarded **+8 marks** for correct answer and **-2 Mark** for wrong answer
Comprehension#3 - You will be awarded **+8 marks** for correct answer and **-3 Mark** for wrong answer

Comprehension #1

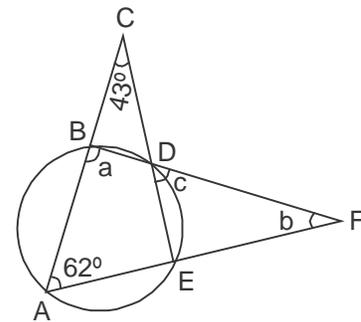
A right circular cylinder just encloses a sphere of radius r .



31. Surface area of the sphere is
 (A) $2\pi r^2$ (B) $4\pi r^2$
 (C) $2\pi r$ (D) $3\pi r^2$
32. Curved surface area of the cylinder is
 (A) $2\pi r^2$ (B) $4\pi r^2$ (C) $2\pi r$ (D) $3\pi r^2$
33. Ratio of the areas obtained in (1) and (2) is
 (A) 1:2 (B) 2:1 (C) 1:1 (D) 2:3

Comprehension #2

In the given figure, if $\angle ACE = 43^\circ$ and $\angle EAC = 62^\circ$ then



34. The value of a is
 (A) 62 (B) 105
 (C) 13 (D) 118
35. The value of b is
 (A) 62 (B) 105
 (C) 13 (D) 118
36. The value of c is
 (A) 62 (B) 105 (C) 13 (D) 118

(Space for rough work)

Comprehension #3

Over the post 200 working days, the number of defective parts produced by a machine is given in the following table :

No. of defective parts	0	1	2	3	4	5	6	7	8	9	10	11	12	13
No. of day on which the defective parts produced	50	32	22	18	12	12	10	10	10	8	6	6	2	2

Find the probability that tomorrow's output will have

37. no defective part
 (A) 0.25 (B) 0.3 (C) 0.5 (D) 0.75
38. at least one defective part
 (A) 0.25 (B) 0.7 (C) 0.6 (D) 0.75
39. not more than 5 defective parts
 (A) 0.71 (B) 0.72 (C) 0.73 (D) 0.75
40. More than 13 defective parts
 (A) 0 (B) 0.25 (C) 0.5 (D) 0.75

SINGLE CORRECT TYPE]

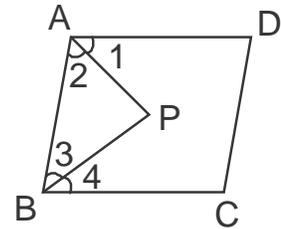
Each question has four choices (A), (B), (C) and (D) out of which only one is correct. You will be awarded +3 marks for correct answer and -1 mark for wrong answer .

41. When simplified the product $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\dots\dots\dots\left(1+\frac{1}{n}\right)$ becomes
 (A) n (B) $\frac{n-1}{2}$ (C) $\frac{n+1}{2}$ (D) $\frac{n}{2}$
42. If one factor of $a(x+y+z)+bx+by+bz$ is $(x+y+z)$ then the second factor is
 (A) $ax+ay+az$ (B) $bx+by+bz$ (C) $bx+by-bz$ (D) $a+b$

(Space for rough work)

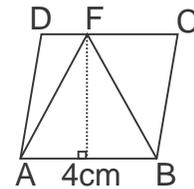
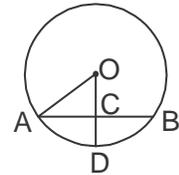


43. The value of n for which the expression $9x^4 - 12x^3 - nx^2 - 8x + 4$ becomes a perfect square is
 (A) 12 (B) 16 (C) 18 (D) 24
44. The expression $x^2 + px + q$ with p and q greater than zero has its minimum value when
 (A) $x = -p$ (B) $x = p$ (C) $x = p/2$ (D) $x = -p/2$
45. The quadrilateral, whose vertices are $(-1,1), (0,-3), (5,2)$ and $(4,6)$ is
 (A) a square (B) a rectangle (C) a rhombus (D) a parallelogram
46. The linear equation $2x - 5y = 7$ has
 (A) A unique solution (B) Two solutions
 (C) Infinitely many solutions (D) No solution
47. Which of the following equations represents a line parallel to y -axis?
 (A) $2y = 5x$ (B) $2y = 5$ (C) $2x = 5$ (D) $2x + 3y = 5$
48. If a linear equation has solutions $(-2,2), (0,0)$ and $(2,-2)$, then it is of the form
 (A) $y - x = 0$ (B) $x + y = 0$ (C) $-2x + y = 0$ (D) $-x + 2y = 0$
49. In a right angled triangle. one acute angle is double the other then the hypotenuse is
 (A) Equal to smallest side (B) Double the smallest side
 (C) Triple the smallest side (D) None of these
50. In the adjoining figure. AP and BP are angle bisector of $\angle A$ and $\angle B$ which meets at P on the parallelogram $ABCD$ Then $2\angle APB =$
 (A) $\angle C + \angle D$ (B) $\angle A + \angle C$
 (C) $\angle B + \angle D$ (D) $2\angle C$



(Space for rough work)

51. $ABCD$ is quadrilateral, If AC and BD are its diagonals then the
 (A) sum of the squares of the sides of the quadrilateral is equal to the sum of the squares of its diagonals.
 (B) perimeter of the quadrilateral is equal to the sum of the diagonals
 (C) perimeter of the quadrilateral is less than the sum of the diagonals
 (D) perimeter of the quadrilateral is greater than the sum of the diagonals
52. If PQ is a chord of a circle with radius r units and R is a point on the circle such that $\angle PRQ = 90^\circ$, then the length of PQ is
 (A) r units (B) $2r$ units (C) $r/2$ units (D) $4r$ units
53. If an equilateral triangle PQR is inscribed in a circle with centre O , then $\angle QOR$ is equal to
 (A) 60° (B) 30° (C) 120° (D) 90°
54. In the given figure, if $OA = 5\text{cm}$, $AB = 8\text{cm}$ and OD is perpendicular to AB , then CD is equal to
 (A) 2cm (B) 3cm
 (C) 4cm (D) 5cm
55. In the given figure, $ABCD$ is a parallelogram then $ar(\triangle AFB)$ is
 (A) 16cm^2 (B) 8cm^2
 (C) 4cm^2 (D) 6cm^2
56. AD is the median of a triangle ABC , If area of triangle $ADC = 15\text{cm}^2$, then $ar(\triangle ABC)$ is
 (A) 15cm^2 (B) 22.5cm^2 (C) 30cm^2 (D) 37.5cm^2



(Space for rough work)

PART -III

[Physics]

[SINGLE CORRECT TYPE]

Each question has four choices (A), (B), (C) and (D) out of which only one is correct. You will be awarded +3 marks for correct answer and -1 mark for wrong answer .

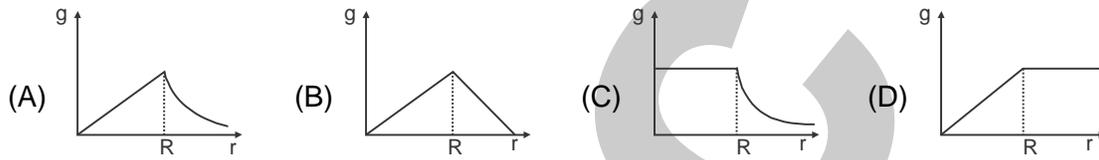
57. A car accelerates from rest at a constant rate α for some time, after which it decelerates at a constant rate β and comes to rest. If total time elapsed is t , then maximum velocity acquired by car will be
- (A) $\frac{(\alpha^2 - \beta^2)t}{\alpha\beta}$ (B) $\frac{\alpha\beta t}{\alpha + \beta}$ (C) $\frac{(\alpha^2 + \beta^2)t^2}{\alpha\beta}$ (D) $\frac{(\alpha^2 + \beta^2)t}{\alpha\beta}$
58. A body, starting from rest, moves in a straight line with a constant acceleration a for a time interval t during which it travels a distance s_1 . If it continues to move with the same acceleration for the next time interval t during which it travels a distance s_2 . The relation between s_1 and s_2 is
- (A) $s_2 = s_1$ (B) $s_2 = 2s_1$ (C) $s_2 = 3s_1$ (D) $s_2 = 7s_1$
59. A body, moving in a straight line, with an initial velocity u and a constant acceleration a , covers a distance of 40m in the 4th second and a distance of 60 m in the 6th second. The values of u and a respectively are
- (A) $10 \text{ ms}^{-1}, 5 \text{ ms}^{-2}$ (B) $10 \text{ ms}^{-1}, 10 \text{ ms}^{-2}$ (C) $5 \text{ ms}^{-1}, 5 \text{ ms}^{-2}$ (D) $5 \text{ ms}^{-1}, 10 \text{ ms}^{-2}$
60. A force of 100N acts on a ball moving on a surface. The force of friction that must act between the surface of the ball and the surface so that the ball keeps on moving with constant velocity over the surface must be
- (A) zero (B) 100N (C) 200N (D) 300N
61. A ship of mass $3 \times 10^7 \text{ kg}$ initially at rest is pulled by a force of $5 \times 10^4 \text{ N}$ through a distance of 3m. Assume that the resistance due to water is negligible, the speed of the ship is
- (A) 1.5 ms^{-1} (B) 60 ms^{-1} (C) 0.1 ms^{-1} (D) 5 ms^{-1}
62. In a rocket, fuel burns at the rate of 1 kg s^{-1} . This fuel is ejected from the rocket with a velocity of 60 km s^{-1} . This exerts a force on the rocket equal to
- (A) 6000N (B) 60000N (C) 60N (D) 600N

(Space for rough work)

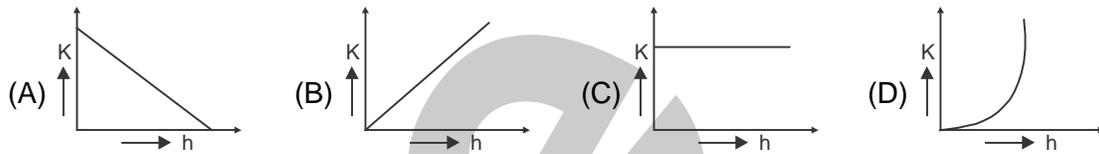
63. Two masses m and M are kept at a distance r , The ratio of the force exerted on m due to M and that of M due to m is equal to

(A) $\frac{m}{M}$ (B) $\frac{M}{m}$ (C) $\frac{mr}{M}$ (D) 1:1

64. Which of the following graphs correctly represents the variation of g on earth ?



65. Which of the following graph best represents the kinetic energy (K.E) of a freely falling body and its height h above the ground ?



66. The mass of a ball A is twice the mass of another ball B. The ball A moves at half the speed of the ball B. The ratio of the kinetic energy of A to that of B is

(A) $\frac{3}{2}$ (B) $\frac{1}{2}$ (C) $\frac{5}{2}$ (D) $\frac{2}{1}$

67. An object is 11 km below sea level. A research vessel sends down a sonar signal to confirm this depth. After how long can it expect to get the echo ? (Take the speed of sound in sea water as $1,520 \text{ ms}^{-1}$)

(A) 15.30 s (B) 14.47 s (C) 12.20s (D) 11.13s

68. A boy stands 66.4 m in front of a high wall and then blows a whistle. If speed of sound is 332 ms^{-1} , the echo is heard after

(A) 0.45s (B) 0.48s (C) 0.40s (D) 0.46s

(Space for rough work)



PART -IV

[Chemistry]

[SINGLE CORRECT TYPE]

Each question has four choices (A), (B), (C) and (D) out of which only one is correct. You will be awarded +3 marks for correct answer and -1 mark for wrong answer .

69. The rate of diffusion decreases
 (A) with increase in temperature (B) with increase in kinetic energy of molecules
 (C) with decrease in temperature (D) no effect of temperature
70. The melting point temperature of the solid state and freezing point temperature of the liquid state of the same substance are
 (A) both same (B) both different (C) can't say (D) none of these
71. Three students Ankit, Dinesh and Manoj were given three unknown substances X, Y and Z respectively during the lab activity.

Substance	Property	
	Boiling point (°C)	Solubility in water
X	56	Soluble
Y	45	Insoluble
Z	90	Soluble

On the basis of these properties, which student has chosen the correct separation technique, to separate a substance from the substance-water mixture?

- (A) Ankit - separating funnel (B) Dinesh - distillation
 (C) Manoj - Fractional distillation (D) All are correct
72. The zig-zag movement of dispersed phase particles in a colloidal system is known as
 (A) Brownian motion (B) transitional motion
 (C) circular motion (D) linear motion
73. In carbon disulphide (CS₂), the mass of sulphur in combination with 3.0 g of carbon is
 (A) 4.0 g (B) 6.0 g (C) 64.0 g (D) 16.0 g
74. What mass of carbon dioxide (CO₂) will contain 3.011×10^{23} molecules?
 (A) 11.0 g (B) 22.0 g (C) 4.4 g (D) 44.0 g
75. How many grams of H₂SO₄ are present in 0.25 mole of H₂SO₄?
 (A) 2.45 (B) 24.5 (C) 0.245 (D) 0.25

(Space for rough work)

76. The weight of a molecule of the compound $C_{60}H_{122}$ is
(A) 1.4×10^{-21} g (B) 1.09×10^{-21} g (C) 5.025×10^{23} g (D) 16.023×10^{23} g
77. In Rutherford's gold foil experiment most of the α - particles pass through the gold foil without any deviation from their paths. This indicates that
(A) the atom is spherical
(B) there is a positively charged nucleus at the centre of the atom
(C) the entire mass of the atom is concentrated at the nucleus of the atom
(D) most portion of the atom is empty space.
78. Rutherford's model of an atom could not explain its stability. This was overcome by another atomic model. The postulates of the new model of atom are
(i) an atom consists of a positively charged sphere and the electrons are embedded in it
(ii) each shell or orbit corresponds to a definite energy. Therefore, these circular shell are also known as energy shells
(iii) as long as the electrons revolve in the stationary orbit it neither radiates nor absorbs energy.
(A) (i) and (ii) (B) (ii) and (iii) (C) (i) and (iii) (D) (i), (ii) and (iii)
79. The atomic mass of the lead is 208 and its atomic number is 82, the atomic mass of bismuth is 209 and its atomic number is 83. The ratio of the neutrons/protons
(A) is higher in lead than bismuth (B) is lower in lead than bismuth
(C) is equal in both lead and bismuth (D) does not depend on the given data
80. The total number of neutrons in dipositive zinc ions with mass number 70 is
(A) 34 (B) 40 (C) 36 (D) 38

(Space for rough work)

