

# VISA

## Vision Infinity Scholarship Award

Students of Vision Infinity who secure All India Rank in IIT-JEE within top100, will be Awarded scholarship for four years during B. Tech in IIT

# IIT-JEE 2012

All India Rank in IIT-JEE	Scholarship	Total (in four years)
AIR 1	Rs. 10,000/month	Rs. 4,80,000/-
AIR 2	Rs. 7,500/month	Rs. 3,60,000/-
AIR 3	Rs. 6,000/month	Rs. 2,88,000/-
AIR 4 -10	Rs. 5,000/month	Rs. 2,40,000/-
AIR 11- 20	Rs. 3,000/month	Rs. 1,44,000/-
AIR 21-30	Rs. 1,500/month	Rs. 72,000/-
AIR 31-50	Rs. 1,000/month	Rs. 48,000/-
AIR 51-100	Rs. 500/month	Rs. 24,000/-

\* Terms & Conditions apply

## Model Test Paper-II Two Year Programme

Name of the Student : .....

Reg. No. : .....

Duration : 1.30 hour

Max. Marks : 114

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

### INSTRUCTIONS:

This booklet contain 30 questions in five sections.

**Section A :** Contains questions with **only one** correct answer. For every right answer you will be awarded 3 marks and for wrong answer you will be awarded -1 (Negative One) mark.

**Section B :** Contains Statement-1 (Assertion) & Statement-2 (Reason) type questions with **only one** correct answer. For every right answer you will be awarded 3 marks and for wrong answer you will be awarded -1 (Negative One) mark.

**Section C :** Contains questions with **one or more than one** correct answer. For every right answer you will be awarded 4 marks and for wrong answer you will be awarded -1 (Negative One) mark.

**Section D :** Contains comprehension type questions with **only one** correct answer. For every right answer you will be awarded 4 marks and for wrong answer you will be awarded -1 (Negative One) mark.

**Section E :** For each question in Section-E, you will be **awarded 6 marks** if you darken All the bubbles corresponding only to the correct answer or **awarded 1 mark** each for correct bubbling of answer in any row. **No negative mark will be awarded for an incorrectly bubbled answer.**

## Physics

### Section - A

This section contains 3 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. To get an image larger than the object, one can use :
  - (A) a convex mirror but not a concave mirror
  - (B) a concave mirror but not a convex mirror
  - (C) either a convex mirror or a concave mirror
  - (D) a plane mirror.
  
2. An electric current can be produced in a closed loop :
  - (A) by connecting it to a battery, but not by moving a magnet near it
  - (B) by moving a magnet near it, but not by connecting it to a battery
  - (C) by connecting it to a battery, as well as by moving a magnet near it
  - (D) neither by connecting it to a battery nor by moving a magnet near it.
  
3. The site of hydroelectric plant should be chosen carefully because it :
  - (A) produces a large amount of carbon monoxide and carbon dioxide
  - (B) produces a larger amount of electricity
  - (C) affects the organism of the region
  - (D) is expensive.

## Section B

### Directions for questions no. 4

The following question consists of two statements, one labelled as 'STATEMENT-1 (Assertion)' and the other labelled as 'STATEMENT-2 (Reason)'. You are to examine these two statements carefully and select the answer to these questions using the codes given below :

- (A) Statement-1 is True, Statement-2 is True; Statement-2 is the correct explanation of Statement-1.
- (B) Statement-1 is True, Statement-2 is True; Statement-2 is not a correct explanation of Statement-1.
- (C) Statement-1 is True, Statement-2 is False
- (D) Statement-1 is False, Statement-2 is True.

4. STATEMENT-1

A convex mirror always forms a virtual, erect and smaller image for a real object.  
because

STATEMENT-2

The size, location and nature of the image formed by a spherical mirror depends on the position of the object.

## Section C

This section contains 2 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE** is/are correct.

5. Which of the following statements are correct regarding the characteristics of sources of energy ?
- (A) It should provide energy over a long period of time
  - (B) It should be easy to store and transport
  - (C) It should be economical
  - (D) It should yield large net energy output.



### Section - E

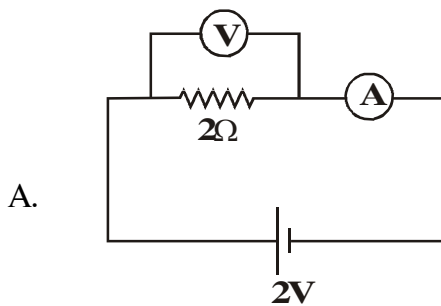
This section contains 1 question. Question contains statements given in two columns, which have to be matched. Statements in **Column I** are labelled as A, B, C and D whereas statements in **Column II** are labelled as 1, 2, 3 and 4. The answers to these questions have to be appropriately bubbled as illustrated in the following example.

If the correct matches are A-2, A-3, B-1, B-4, C-3, C-4 and D-2, then the correctly bubbled matrix will look like the following :

	A	B	C	D
1	①	●	①	①
2	●	②	②	●
3	●	③	●	③
4	④	●	●	④

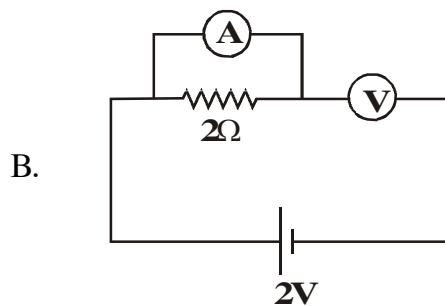
10. Match the following :

**Column I**

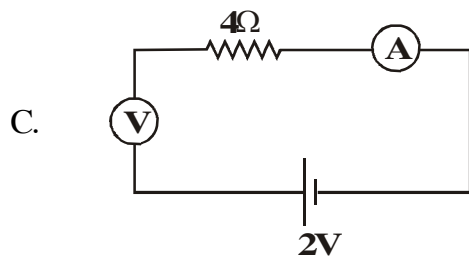


**Column II**

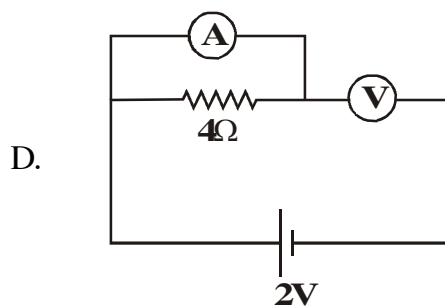
1. Ammeter is not connected correctly in the circuit



2. Voltmeter is not connected correctly in the circuit



3. The current recorded by ammeter is 1 A



4. The potential difference recorded by voltmeter is 2 V

## Chemistry

### Section A

This section contains 3 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

11. Maximum number of electrons present in 'N' shell is :
- (A) 18 (B) 32  
(C) 2 (D) 8.
12. Which of the following is not a salt :
- (A) Sodium chloride (NaCl) (B) Slaked lime (Ca(OH)<sub>2</sub>)  
(C) Zinc nitrate (Zn(NO<sub>3</sub>)<sub>2</sub>) (D) Lead sulphate (PbSO<sub>4</sub>).
13. Washing soda is :
- (A) Na<sub>2</sub>CO<sub>3</sub>·7H<sub>2</sub>O (B) Na<sub>2</sub>CO<sub>3</sub>·H<sub>2</sub>O  
(C) Na<sub>2</sub>CO<sub>3</sub>·10H<sub>2</sub>O (D) Na<sub>2</sub>CO<sub>3</sub>·6H<sub>2</sub>O.

### Section B

#### Directions for questions no. 14

The following question consists of two statements, one labelled as 'STATEMENT-1 (Assertion)' and the other labelled as 'STATEMENT-2 (Reason)'. You are to examine these two statements carefully and select the answer to these questions using the codes given below :

- (A) Statement-1 is True, Statement-2 is True; Statement-2 is the correct explanation of Statement-1.  
(B) Statement-1 is True, Statement-2 is True; Statement-2 is not a correct explanation of Statement-1.  
(C) Statement-1 is True, Statement-2 is False  
(D) Statement-1 is False, Statement-2 is True.

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The hi-Tech Institute

**VISION**  
**Infinity**

*A synonym of success...*

Space for rough work

14. STATEMENT 1 :  
A sulphide ores are concentrated by froth flotation process.  
because  
STATEMENT 2 :  
Pine oil act as frothing agent in froth flotation process.

### Section C

This section contains 2 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE** is/are correct.

15. Which of the following is/are correct :
- (A) The general formula of alkane is  $C_n H_{2n+2}$
  - (B) The general formula of alkene is  $C_n H_{2n+2}$
  - (C) The general formula of alkene is  $C_n H_{2n}$
  - (D) The general formula of alkyne is  $C_n H_{2n-2}$ .
16. The process of removal of gangue particles from ores is known as :
- (A) Concentration
  - (B) Refining
  - (C) Smelting
  - (D) Roasting.

### Section - D

This section contains 1 paragraph. Based upon each paragraph, 3 multiple choice questions have to be answered. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

### Comprehension (Question 17 to 19)

The masses of particles like molecules, atoms, ions e.t.c. are so small that it is not convenient to express them in gm or kg. The masses are therefore determined relative to some standard reference atom. In 1960, the general conference of weights and measures introduced the unified mass unit (u) which was also referred to as atomic mass unit (a.m.u.)

$$1 \text{ amu} = \frac{\text{mass of one } {}_6\text{C}^{12}\text{atom}}{12}$$

Atoms, molecules and ions are basic units in chemistry. A definite number of these entities participate in a chemical reaction. In order to know the number a unit mole is defined. Mole is a unit which represents  $6.022 \times 10^{23}$  particles (atoms, molecules, or ions e.t.c.) irrespective of their nature. The number  $6.022 \times 10^{23}$  is called Avogadro's number and is represented by No.

17. The number of molecules in 18 gm of water is : (at. wt. of H = 1, O = 16)  
(A)  $9.033 \times 10^{23}$  (B)  $6.022 \times 10^{23}$   
(C) 27 (D)  $3.011 \times 10^{22}$ .
18. How many gm are present in one mole of  $\text{K}_2\text{CO}_3$ . (at. wt. of K = 39, C = 12, O = 16)  
(A) 101.1 (B) 170.1  
(C) 138 (D) 158.
19. 1 Mole of any species contains :  
(A)  $6.022 \times 10^{23}$  (B)  $6.022 \times 10^{25}$   
(C)  $6.022 \times 10^{24}$  (D)  $6.022 \times 10^{19}$ .

### Section - E

This section contains 1 question. Question contains statements given in two columns, which have to be matched. Statements in **Column I** are labelled as A, B, C and D whereas statements in **Column II** are labelled as 1, 2, 3 and 4. The answers to these questions have to be appropriately bubbled as illustrated in the following example.

If the correct matches are A-2, A-3, B-1, B-4, C-3, C-4 and D-2, then the correctly bubbled matrix will look like the following :

	A	B	C	D
1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
3	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

20. Match the following :

	Column I(Ores)		Column II(Formula)
A.	Haematite	1.	$\text{Fe}_2\text{O}_3$
B.	Copper pyrite	2.	ZnS
C.	Bauxite	3.	$\text{CuFeS}_2$
D.	Zinc blende	4.	$\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$

### Mathematics

#### Section - A

This section contains 3 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

21. When two circles touches internally then the number of common tangent(s) is :  
 (A) one                      (B) two                      (C) three                      (D) four.
22.  $2\sin^2 \theta + 4\cos^2 \theta = 1$  is an :  
 (A) equation                      (B) identity                      (C) expression                      (D) None of these.

23. From an external point the number of tangents can be drawn to a circle is :  
(A) one                      (B) two                      (C) three                      (D) four.

**Section - B**

**Direction for question no. 24**

The following question consists of two statements, one labelled as 'STATEMENT-1 (Assertion)' and the other labelled as 'STATEMENT-2 (Reason)'. You are to examine these two statements carefully and select the answer to these questions using the codes given below :

- (A) Statement-1 is True, Statement-2 is True; Statement-2 is the correct explanation of Statement-1.  
(B) Statement-1 is True, Statement-2 is True; Statement-2 is not a correct explanation of Statement-1.  
(C) Statement-1 is True, Statement-2 is False  
(D) Statement-1 is False, Statement-2 is True.

24. STATEMENT-1 :

The diameter of a metallic sphere is 6 cm. The sphere is melted and drawn into a wire of uniform circular cross-section. If the length of the wire is 36 m, then its radius = 0.1 cm.

because

STATEMENT-2 :

$$\text{Volume of sphere} = \frac{4}{3}\pi r^2 h \text{ and volume of cylinder} = \pi r^2 h .$$

**Section - C**

This section contains 2 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE** is/are correct.

25. If  $2x^2 + px + 8 = 0$  has real roots, then the values of p is /are :  
(A) 8                      (B) - 8                      (C) > 8                      (D) < -8

26. Select the correct option(s) :

(A) An equilateral triangle of side  $2a$  has altitude  $\sqrt{3} a$

(B) An equilateral triangle of side  $2a$  has altitude  $\frac{\sqrt{3}}{2} a$

(C) Points lying on the same circle are called concyclic points

(D) A polygon whose all vertices lie on a circle is called a cyclic polygon.

### Section - D

This section contains 1 paragraph. Based upon each paragraph, 3 multiple choice questions have to be answered. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

#### Comprehension-(Questions 27 to 29)

$$\sin(90^\circ + \theta) = \cos \theta, \sin(180^\circ + \theta) = -\sin \theta$$

$$\sec(90^\circ - \theta) = \operatorname{cosec} \theta, \cot(90^\circ - \theta) = \tan \theta$$

$$\sec^2 \theta - 1 = \tan^2 \theta, \sin^2 \theta + \cos^2 \theta = 1$$

$$\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$$

with the help of above conditions solve the following :

27.  $\tan^4 \theta + \tan^2 \theta + \sec^2 \theta =$

(A)  $2 \tan^2 \theta$                       (B)  $\sec^4 \theta$                       (C) 1                      (D)  $2 \tan^4 \theta$

28. The value of  $\sin 225^\circ =$

(A)  $-\frac{1}{\sqrt{2}}$                       (B)  $\frac{1}{\sqrt{2}}$                       (C)  $-\sqrt{2}$                       (D)  $\frac{1}{2}$

29.  $\frac{\operatorname{cosec} \theta}{\operatorname{cosec} \theta - 1} + \frac{\operatorname{cosec} \theta}{\operatorname{cosec} \theta + 1} =$

- (A)  $2 \cos^2 \theta$       (B)  $\operatorname{cosec}^2 \theta$       (C)  $2 \sec^2 \theta$       (D)  $\sec^2 \theta$

**Section - E**

This section contains 1 question. Question contains statements given in two columns, which have to be matched. Statements in **Column I** are labelled as A, B, C and D whereas statements in **Column II** are labelled as 1, 2, 3 and 4. The answers to these questions have to be appropriately bubbled as illustrated in the following example.

If the correct matches are A-2, A-3, B-1, B-4, C-3, C-4 and D-2, then the correctly bubbled matrix will look like the following :

	A	B	C	D
1	①	●	①	①
2	●	②	②	●
3	●	③	●	③
4	④	●	●	④

30. Match the following :

**Column I**

- A.  $6x - y = 3$  and  $7x + 4y = 9$
- B. The equations have infinitely many common solutions.
- C.  $x - 2y = 5$  and  $2x - 4y - 10 = 0$
- D.  $x - 4y + 14 = 0$  and  $3x + 2y - 14 = 0$

**Column II**

1. The lines may intersect in a single point.
2. a unique common solution
3. The lines may be coincident.
4.  $x = \frac{21}{31}; y = \frac{33}{31}$



**ANSWER**  
**2-Year-Set-B**

- |     |  |     |                                  |     |   |
|-----|--|-----|----------------------------------|-----|---|
| 1.  | B                                      | 11. | B                                | 21. | A                                       |
| 2.  | C                                      | 12. | B                                | 22. | A                                       |
| 3.  | C                                      | 13. | C                                | 23. | B                                       |
| 4.  | B                                      | 14. | B                                | 24. | C                                       |
| 5.  | A,B,C,D                                | 15. | A,C,D                            | 25. | A,B,C,D                                 |
| 6.  | B,C,D                                  | 16. | A                                | 26. | A,C,D                                   |
| 7.  | B                                      | 17. | B                                | 27. | B                                       |
| 8.  | C                                      | 18. | C                                | 28. | A                                       |
| 9.  | A                                      | 19. | A                                | 29. | C                                       |
| 10. | A : 3,4<br>B : 1,2<br>C : 2<br>D : 1,2 | 20. | A : 1<br>B : 3<br>C : 4<br>D : 2 | 30. | A : 1,2,4<br>B : 3<br>C : 3<br>D : 1,2. |