

# 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**  
**2011**

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-I**

### **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.**

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The hi-Tech Institute

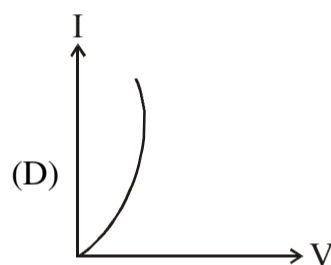
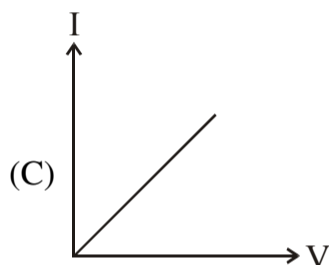
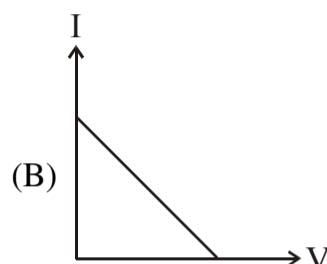
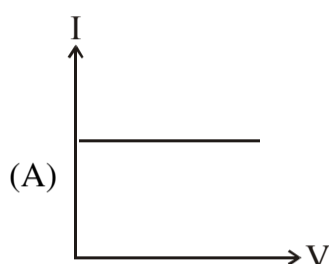
**VISION**  
**Infinity**

*A synonym of success...*

**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.

- The element which can be used in manufacturing solar cell is :  
(A) Aluminium      (B) Iron              (C) Copper              (D) Selenium.
- Which of the following curve depicts the correct representation of Ohm's law :



- A vertical wire carries a current in upward direction. An electron sent horizontally towards the wire will be deflected :  
(A) towards right      (B) towards left      (C) upwards              (D) downwards.

**Section B**

**Directions for questions no. 4**

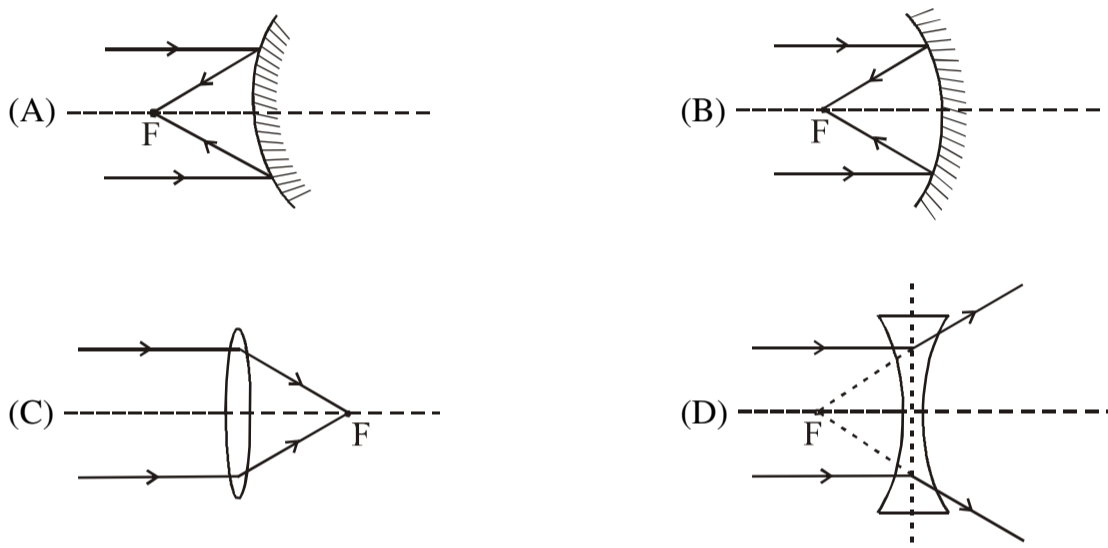
The following question consists of two statements, one labelled as STATEMENT-1 (Assertion) and the other labelled as STATEMENT-2 (Reason) . You are to examine these two statements carefully and select the answer to these questions using the codes given below :

- (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.
- STATEMENT-1  
The inner walls of a box type solar cooker is painted black in colour.  
because  
STATEMENT-2  
A black body is a good absorber of radiation as well as a good emitter.

### 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. A resistor generates 100 J of heat energy in 5 sec when a current of 1A is passed through it. Then :
- (A) The resistance is  $20\Omega$
  - (B) The power of resistor is 20W
  - (C) The resistance will not change if current is increased by 0.5 A
  - (D) If current is increased to 2A, the heat energy developed in 5 sec will increase.
6. Which of the following ray diagrams are correct ?

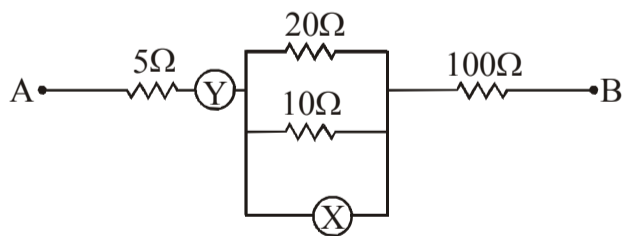


### Section - D

#### Comprehension-(Questions 7 to 9)

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** correct.

The given figure shows a part of circuit. If a current of 12 A passes through the  $5\Omega$  resistor, then



7. Which of the following statements is correct ?
- (A) X represents ammeter to measure current flowing in  $10\Omega$  resistance
  - (B) Y represents voltmeter to measure potential difference across  $5\Omega$  resistance
  - (C) Y represents ammeter to measure the current flowing in  $20\Omega$  resistance
  - (D) X represents voltmeter which can measure the potential difference across  $20\Omega$  resistance

8. The current in  $100\Omega$  resistance is :  
 (A) 5A (B) 8A (C) 10A (D) 12A.
9. If  $I_1$  and  $I_2$  are the currents flowing in  $10\Omega$  and  $20\Omega$  resistance respectively then :  
 (A)  $\frac{I_1}{I_2} = \frac{1}{2}$  (B)  $\frac{I_1}{I_2} = \frac{2}{1}$  (C)  $\frac{I_1}{I_2} = 1$  (D)  $\frac{I_1}{I_2} = \frac{1}{4}$ .

### Section - E

This section contains 1 question. Each 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 :

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

10. Match the following :

#### Column I

- A. Plane mirror  
 B. Concave mirror  
 C. Convex mirror  
 D. Concave lens

#### Column II

1. Forms virtual image only  
 2. Forms diminished image only  
 3. Forms enlarged as well as diminished image  
 4. Forms real as well as virtual image.

### 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. Highest pH value stands for :  
 (A) An acidic solution (B) A basic solution  
 (C) A slightly basic solution (D) Neutral solution.
12. Which reagent distinguishes ethylene from acetylene :  
 (A) Aqueous alkaline permagnate (B) Chlorine dissolved in carbon tetrachloride  
 (C) Ammonical cuprous chloride (D) Concentrated sulphuric acid.

13. An element A (at. wt. = 75) and B (at. wt. = 25) combine to form a compound. The compound contains 75% A by weight. The formula of the compound will be :  
(A) AB                      (B) AB<sub>4</sub>                      (C) AB<sub>3</sub>                      (D) A<sub>3</sub>B.

### Section B

#### Directions for questions 14 to 16.

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.
14. STATEMENT 1 :  
The formula of sodium oxide is Na<sub>2</sub>O.  
because  
STATEMENT 2 :  
1 mole of sodium oxide contains 2 mol of sodium atoms.

### Section C

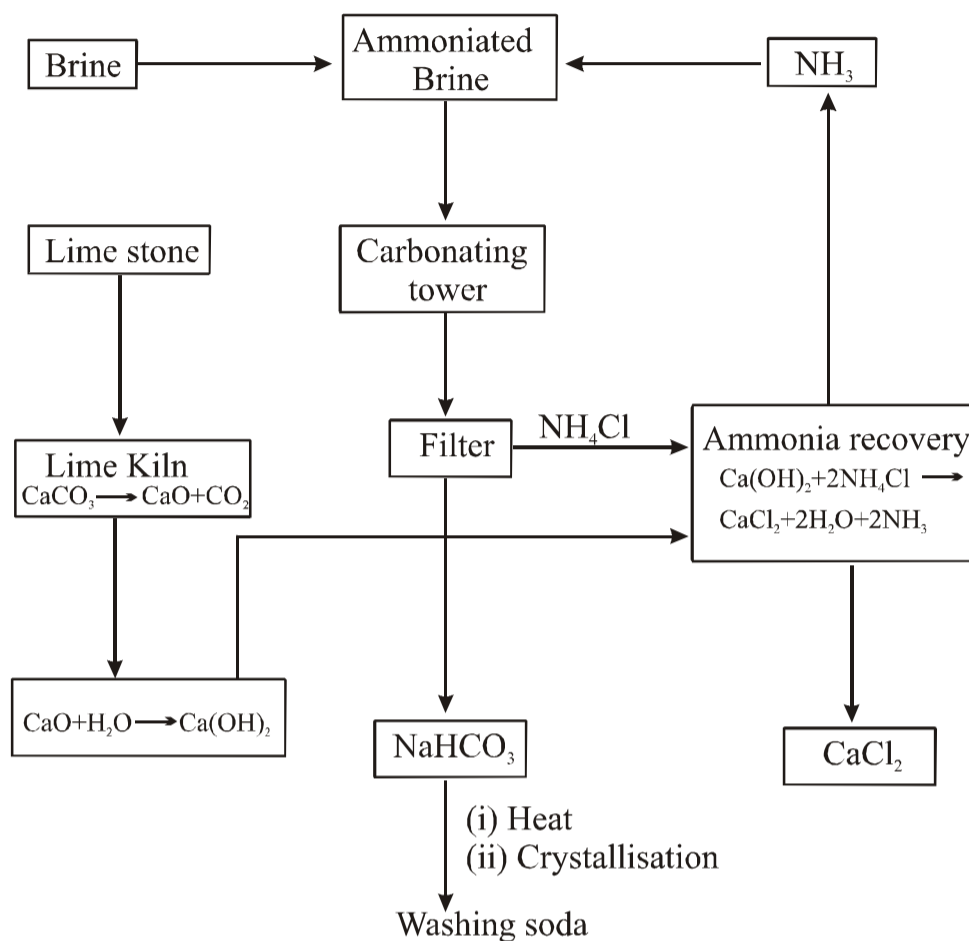
This section contains 2 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE** is/are correct.

15. Which are not natural colloid :  
(A) NaCl                      (B) Blood                      (C) KCl                      (D) RCOONa.
16. Electrolysis method is used for the extraction of :  
(A) Cu                      (B) Na                      (D) Fe                      (D) Al.

### Section - D

#### Comprehension-(Question 17 to 19)

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** correct.



17. The above process is known as :  
 (A) Solvay process (B) Haber s process  
 (C) Ostwald s process (D) Contact process.
18. What is the formula of washing soda is :  
 (A)  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$  (B)  $\text{Na}_2\text{CO}_3 \cdot 7\text{H}_2\text{O}$  (C)  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$  (D)  $\text{Na}_2\text{CO}_3 \cdot 2\text{H}_2\text{O}$ .
19. Which of the following is byproduct in the above process ?  
 (A)  $\text{NH}_4\text{OH}$  (B)  $\text{CaCl}_2$  (C)  $\text{CaO}$  (D)  $\text{NH}_4\text{Cl}$ .

### Section - E

This section contains 1 question. Each 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 :

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

20. Match the following :

<b>Column I</b> (Molecular Formula)	<b>Column II</b> (Compounds)
A. $\text{CH}_3\text{CHO}$	1. Marsh gas
B. $\text{CH}_3\text{COOH}$	2. Acetic acid
C. $\text{CH}_3\text{OH}$	3. Methanol
D. $\text{CH}_4$	4. Acetaldehyde

### 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. If sum of the squares of the zeros of the quadratic polynomial  $f(x) = x^2 - 10x + k$  is 50, then the value of k is :
- (A) 20                      (B) 25                      (C) 30                      (D) 35
22. The probability that a leap year selected at random will contain 53 Monday and 52 Tuesday is :
- (A)  $\frac{1}{366}$                       (B)  $\frac{2}{366}$                       (C)  $\frac{1}{7}$                       (D)  $\frac{2}{7}$
23. The circumradius of the triangle whose vertices are (0, 8) (6, 0) and (0, 0) is :
- (A) 5                      (B) 4                      (C) 3                      (D) 6.

#### 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 roots of the equation  $8x^2 - 22x + 15 = 0$  are rational.  
because

STATEMENT-2 :

The roots of the quadratic equation  $ax^2 + bx + c = 0$  are rational if and only if  $a, b, c$  are real  
 $a \neq 0$  and  $b^2 - 4ac$  is a perfect square.

### 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. The solution of the equation  $x^4 - 10x^2 + 9 = 0$  is/are :

- (A) 1                      (B) 1                      (C) 3                      (D) 3.

26. If  $\Delta ABC \sim \Delta PQR$  then  $\frac{\text{area}\Delta ABC}{\text{area}\Delta PQR} =$

- (A)  $\frac{AB^2}{PQ^2}$                       (B)  $\frac{AC^2}{PR^2}$                       (C)  $\frac{AC^2}{PQ^2}$                       (D)  $\frac{BC^2}{PR^2}$

### Section -D

#### Comprehension (Questions 27 to 29)

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** correct.

Given  $A(a + b, a - b)$ ,  $B(2a + b, 2a - b)$ ,  $C(a - b, a + b)$  are three vertices of a parallelogram ABCD. Then answer the following :

27. The co-ordinate of D is :

- (A)  $(-b, b)$                       (B)  $(-a, a)$                       (C)  $(a, b)$                       (D)  $(-a, b)$

28. The co-ordinate of point of intersection of AC and BD is :

- (A)  $(-b, b)$                       (B)  $(-a, a)$                       (C)  $(a, a)$                       (D)  $(b, b)$

29. The area of parallelogram ABCD is :

- (A)  $2|ab|$                       (B)  $4|ab|$                       (C)  $2|a^2 + b^2|$                       (D)  $4|a^2 + b^2|$

### Section - E

This section contains 1 question. Each 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 :

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

30. Match the following :

<b>Column I</b>	<b>Column II</b>
A. $11x + 15y + 23 = 0; 7x - 2y - 20 = 0$	1. $x = 2, y = 3$
B. $\frac{2}{x} + \frac{3}{y} = \frac{9}{xy}; \frac{4}{x} + \frac{9}{y} = \frac{21}{xy}, x \neq 0, y \neq 0$	2. $x = 3, y = 2$
C. $\frac{5}{x+y} - \frac{2}{x-y} = -1; \frac{15}{x+y} + \frac{7}{x-y} = 10, x \neq \pm y$	3. $x = 1, y = 3$
D. $\frac{xy}{x+y} = \frac{6}{5}, \frac{xy}{y-x} = 6, x \neq \pm y$	4. $x = 2, y = 3$

## ANSWER

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