

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 2013

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 hours

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.**

You should submit the question paper & answer sheet after the completion of the test to the invigilator.

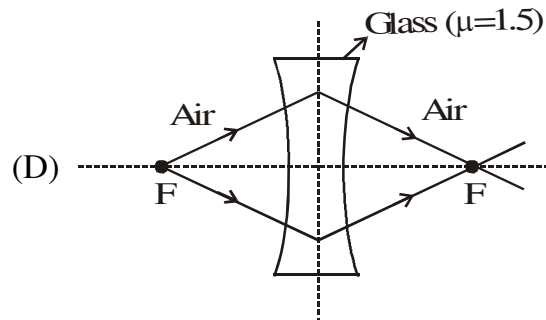
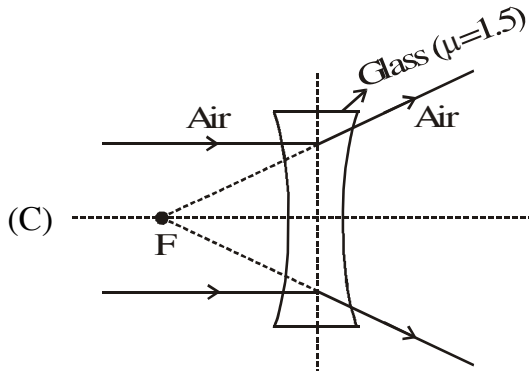
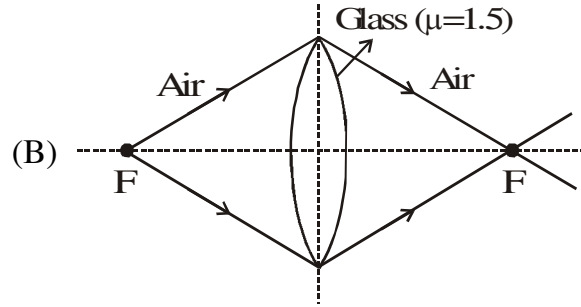
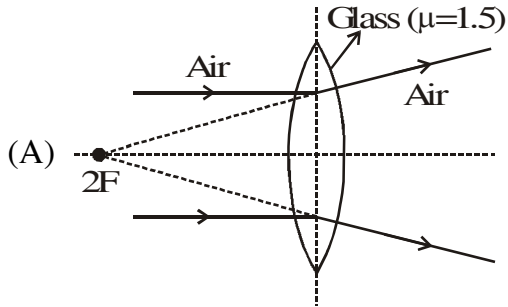
You should keep the question paper & answer sheet clean. Rough work must be done in the space provided.

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. Which of the following ray diagram is correct ? (F = focal length of lens)



2. The unit of magnetic field is :

- (A) Tesla
- (B) Newton
- (C) Farad
- (D) Coulomb.

3. The value of solar constant is :
- (A) 1.4 W/m^2 (B) 1.4 KW/m^2
(C) 1.4 KW/m (D) 1.4 W/m .

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

Alloys are commonly used in electrical heating devices, like electric iron, toasters etc. because

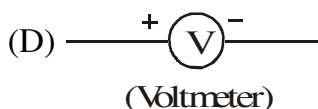
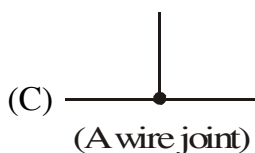
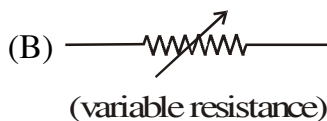
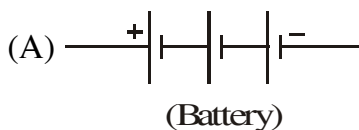
STATEMENT : 2

Alloys do not oxidise or burn readily at high temperatures.

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 are the parts of human eye ?
- (A) Retina (B) Cornea
(C) Pupil (D) Ciliary muscles.
6. Which of the following correctly represents the symbols of some commonly used components in circuit diagrams ?



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** correct.

Comprehension (Question No. 7 to 9)

The water at the surface of the sea or ocean is heated by the Sun while the water in deeper sections is relatively cold. This difference in temperature is exploited to obtain energy in ocean-thermal-energy conversion plants. These plants can operate if the temperature difference between the water at the surface and water at depths up to 2km is X or more. The warm surface water is used to boil a volatile liquid like Y. The vapours of the liquid are then used to run Z. Then

7. The value of X is nearly :
- (A) 5°C (B) 20°C
(C) 60°C (D) 85°C.
8. The liquid Y is :
- (A) Ammonia (B) Kerosene oil
(C) Sulphuric acid (D) Glycerine.
9. Z represents :
- (A) Solar cell (B) Turbine of generator
(C) Solar cooker (D) Solar heater.

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 :

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

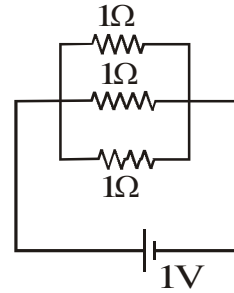
10. Match the following :

Column I

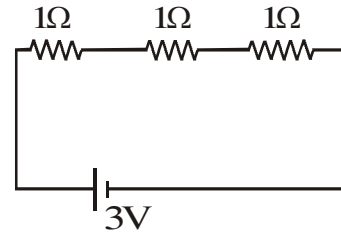
- A. Potential difference across 1Ω resistance is 1 Volt
- B. Potential difference across 2Ω resistance is 1 Volt
- C. Current through 1Ω resistance is 3A
- D. Current through 2Ω resistance is 0.5 A

Column II

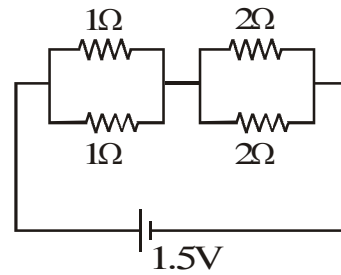
1.



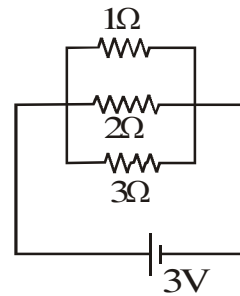
2.



3.



4.



14. STATEMENT 1 :

The formula of Aluminium oxide is Al_2O_3 .

because

STATEMENT 2 :

1mole of Aluminium oxide contains 2 mol of Aluminium 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. Carbon reduction is used for the extraction of :

(A) Fe

(B) Sn

(C) Na

(D) K.

16. Which of following decolourises Br_2 water :

(A) C_nH_{2n+2}

(B) C_nH_{2n}

(C) C_nH_{2n-2}

(D) $C_nH_{2n+1}X$.

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** correct.

Comprehension-(Question 17 to 19)

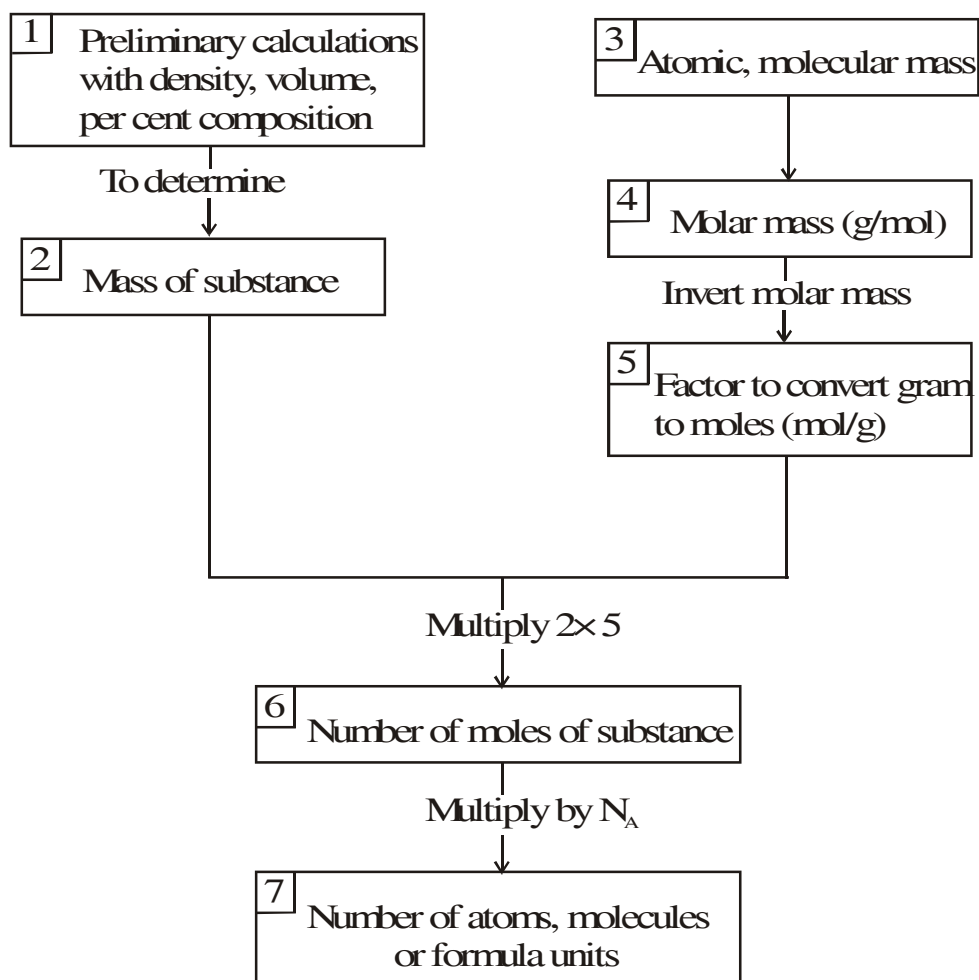
The molar mass of a substance is the mass of 1 mol of that substance, 1 mole of carbon-12 has a mass exactly 12 g. This means that the molar mass of carbon-12 is numerically equal to the atomic mass of carbon-12. These relationship supply the conversion factor to make conversions between mass in grams, amount in moles and number of elementary entities as follows.

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17. The number of electrons present in 1.7 g of NH_3 is :
- (A) $10 N_A$ (B) $N_A / 10$
 (C) $2 N_A$ (D) N_A .

18. 6.02×10^{22} molecules of a substance weigh 20 g. The molecular mass of the substance is:
- (A) 100 g (B) 200 g
(C) 500 g (D) 50 g.
19. Which of the following is the standard for atomic mass ?
- (A) ${}^1_1\text{H}$ (B) ${}^{12}_6\text{C}$
(C) ${}^{14}_6\text{C}$ (D) ${}^{16}_8\text{C}$.

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 :

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

20. Match the following :

Column I (Molecular Formula)	Column II (Compounds)
A. HCHO	1. Ethane gas
B. C ₂ H ₅ COOH	2. Propanoic acid
C. C ₂ H ₅ OH	3. Ethanol
D. C ₂ H ₆	4. Formaldehyde

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. The product of any two consecutive natural numbers is always a/an

- (A) even (B) odd
(C) Prime (D) Multiple of 3.

22. If α and β are the roots of the quadratic equation $x^2 - 5x + 6 = 0$, then the quadratic equation whose roots are $\alpha^2 + \beta^2$ and $\alpha^2\beta^2$ is :

- (A) $x^2 - 49x + 360 = 0$ (B) $x^2 - 49x + 468 = 0$
(C) $x^2 - 53x + 150 = 0$ (D) $x^2 - 40x + 400 = 0$

23. The value of $\sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$ is

(A) $\sec \theta - \tan \theta$

(B) $\operatorname{cosec} \theta - \cot \theta$

(C) $\sec \theta + \tan \theta$

(D) $\operatorname{cosec} \theta + \cot \theta$

SECTION -B

Directions for questions 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 simultaneous system of linear equations $3x - 4y = 7$ and $6x - 8y = 14$ have infinitely many solutions.

because

STATEMENT -2 :

The simultaneous system of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ have

infinitely many solutions if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$.

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. Which of the following statements is/are correct.

(A) The diagonal of a cube with edge ℓ is $\sqrt{3} \ell$

(B) The volume of a hemisphere with radius r is $\frac{2}{3} \pi r^3$.

(C) The curved surface area of a cone with base radius r and slant height ℓ is $\pi r \ell$.

(D) The volume of a cylinder with radius r and height h is $\frac{1}{3} \pi r^2 h$.

26. If t_n denotes the n^{th} term of the A.P. 3, 5, 7, 9 ----- then

(A) $t_8 = 17$

(B) $t_{10} = 21$

(C) $t_{50} = 101$

(D) $t_{200} = 401$

SECTION - D

Comprehension(Question No. 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.

If α, β and γ are the zeros of the cubic polynomial $p(x) = ax^3 + bx^2 + cx + d, (a \neq 0)$, then

we have $\alpha + \beta + \gamma = -\frac{b}{a}$ and $\alpha\beta + \beta\gamma + \gamma\alpha = \frac{c}{a}$ and $\alpha\beta\gamma = \frac{-d}{a}$

From the above information answer the following questions.

27. If α, β, γ are the zeros of the cubic polynomial $p(x) \equiv x^3 - 6x^2 + 5x - 8$, then the value of $\alpha^2 + \beta^2 + \gamma^2$ is
- (A) 16 (B) 20
(C) 24 (D) 26
28. If α, β, γ are the zeros of the cubic polynomial $p(x) \equiv x^3 - 8x^2 + 6x - 10$, then the value of $(\alpha + 1)(\beta + 1)(\gamma + 1)$ is
- (A) 20 (B) 25
(C) 30 (D) 35
29. If α, β, γ are the zeros of the cubic polynomial $p(x) \equiv x^3 - 10x^2 + 12x - 20$, then the value of $\frac{1}{\alpha\beta} + \frac{1}{\beta\gamma} + \frac{1}{\gamma\alpha}$ is
- (A) $\frac{1}{2}$ (B) 2
(C) $-\frac{1}{2}$ (D) -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 :

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

30. Match the following :

Column I (Equation)	Column II (Roots)
A. $x^2 - 5x + 6 = 0$	1. 2
B. $x^2 - 8x + 12 = 0$	2. 3
C. $x^2 + 30x - 216 = 0$	3. 6
D. $x^2 + 33x - 108 = 0$	4. - 36

ANSWER

2-Year

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