

VISA

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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-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 contains 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.**

The IIT-JEE Institute

VISION
Infinity

A synonym of success...

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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 focal length of a convex mirror of radius of curvature 32cm is :
(A) 8cm (B) 16cm (C) 24 cm (D) 32 cm.
- In our house we receive electric power in which one of the wires is with red insulation. This wire is called :
(A) live wire (B) Neutral wire (C) Earth wire (D) Fuse wire.
- The value of solar constant is :
(A) 1.4 kJ (B) 1.4 kJ/8 (C) 1.4 kW (D) 1.4 kW/m².

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
It is expensive to set up wind farms for generating electricity.
because
STATEMENT : 2
Wind farms need a large area.

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. Choose the incorrect statements :
- (A) When a ray of light passes from an optically denser medium to a rarer medium, it slows down
- (B) If a ray of light passes from vacuum to a transparent medium, it will bend away from the normal
- (C) When two lenses are placed in contact, the focal length of the combination is equal to the sum of the focal lengths of the lenses.
- (D) When a ray of light passes through a transparent slab with parallel faces, it is displaced parallel to itself.
6. Which of the following are the advantages of biogas ?
- (A) It is a clean fuel which burns without smoke
- (B) It leaves no ash on burning
- (C) The spent slurry is good manure, rich in nitrogen and phosphorus compounds
- (D) Use of biogas in rural areas leads to saving of firewood, and reduces deforestation.

Section - D

Comprehension-(Questions 7 to 9)

Three identical bulbs are connected in parallel with a battery. The current drawn from the battery is 6A. If one of the bulbs get fused, then

7. The equivalent resistance of the circuit is :
- (A) equal to the resistance of each bulb
- (B) half the resistance of each bulb
- (C) double the resistance of each bulb
- (D) one-fourth the resistance of each bulb.
8. The current drawn from the battery is :
- (A) 2A (B) 3A (C) 4A (D) 6A.
9. The current flowing through each bulb is :
- (A) 2A (B) 3A (C) 4A (D) 6A.

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. An object is placed before a convex lens. Corresponding to different object positions given in column I, match the related properties of image given in column II.

Column I (F = focus of convex lens)

Column II

- | | |
|---|-------------------|
| A. object placed between optical centre and focus | 1. Real image |
| B. object placed at F | 2. Virtual image |
| C. object placed between F and 2F | 3. Inverted image |
| D. object placed beyond 2F | 4. Erect 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. The sulphide ores are generally concentrated by :
- (A) Gravity separation (B) Magnetic separation
(C) Froth flotation process (D) Leaching.
12. The additional substance added to concentrated ore for fusing impurities is called.
- (A) Slag (B) Flux
(C) Gangue (D) All of these.
13. Which is known as hydronium ion.
- (A) H_2^+ (B) H_2O^+
(C) H_3O^+ (D) $H_2O_2^{\oplus}$

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.
14. STATEMENT 1 :
 The formula of sodium oxide is Na_2O .
 because
 STATEMENT 2 :
 1 Mole of sodium oxide contains 2 mol of oxygen 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 of the following reacts with cold water.
 (A) Ag (B) Au
 (C) Na (D) K.
16. Which of the following is/are base in aqueous solution.
 (A) HCl (B) NaOH
 (C) KOH (D) H_2SO_4 .

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.

If a small amount of energy is supplied to an isolated gaseous atom then an electron may be promoted to a higher energy level but if the amount of energy supplied is sufficiently large the electron may be completely removed. This energy is called ionization energy.

The ionization energy depends on the type of electron which is removed. s, p, d and f electrons have orbitals with different shapes. An s-electron penetrates nearer to the nucleus and is therefore more tightly held than p-electron.

17. Long form of the periodic table is based on :
 (A) Number of neutrons (B) Atomic mass
 (C) Atomic number (D) Ionisation potential.
18. All the elements in a group in the periodic table have the same :
 (A) Atomic weight
 (B) Atomic number
 (C) Number of electron available for bonding
 (D) Number of electrons.

19. Higher the ionisation potential in a period is shown by :
- (A) Alkali metals (Group 1) (B) Alkaline earth metals (Group 2)
 (C) Halogen family (Group 17) (D) None.

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	<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 (Salts)

- A. Normal salt
 B. Acid salt
 C. Basic salt
 D. Mixed salt

Column II (formula)

1. NaHCO_3
 2. NaCl
 3. CaOCl_2
 4. Mg(OH)Cl

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 intersect each other, then the number of common tangent is (are) :
- (A) one (B) two (C) three (D) none of these
22. $\tan^2 45^\circ + \tan^2 30^\circ + \tan^2 60^\circ =$:
- (A) $\frac{13}{4}$ (B) $\frac{13}{3}$ (C) $\frac{14}{3}$ (D) $\frac{14}{4}$
23. Longest chord of a circle is called :
- (A) Diameter (B) secant (C) tangent (D) radius

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 :

$$\frac{3 \sin 62^\circ}{\cos 28^\circ} - \frac{\sec 42^\circ}{\operatorname{cosec} 48^\circ} = 2:$$

because

STATEMENT - 2:

$$\sin(90^\circ - \theta) = \cos \theta \text{ and } \sec(90^\circ - \theta) = \operatorname{cosec} \theta$$

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 $x^2 - px + 2 = 0$ has real and equal roots then p is (are) :

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

26. The value of $\sin^4 \theta + \cos^4 \theta$ is (are) :

- (A) $1 - 2\sin^2 \theta - \cos^2 \theta$ (B) ≥ 1
(C) ≤ 1 (D) 0

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.

$$\sin^2 \theta + \cos^2 \theta = 1, \operatorname{cosec} \theta = \frac{1}{\sin \theta}, \sec \theta = \frac{1}{\cos \theta}, \operatorname{cosec}^2 \theta - \cos^2 \theta = 1, \sec^2 \theta - \tan^2 \theta = 1$$

with the help of above formula solve the following :

27. $\frac{\cos^2 \theta + \tan^2 \theta - 1}{\sin^2 \theta} =$:
 (A) $\tan \theta$ (B) $\tan^2 \theta$ (C) $\sec^2 \theta$ (D) $\operatorname{cosec} \theta$
28. $\cot \theta + \tan \theta =$:
 (A) $\sec \theta \cdot \operatorname{cosec} \theta$ (B) $\sin \theta \cdot \cos \theta$ (C) $\sin^2 \theta - \cos^2 \theta$ (D) $1 - \sin \theta$
29. $\frac{\operatorname{cosec}^2 \theta - 1}{\operatorname{cosec} \theta - 1} + \frac{\operatorname{cosec}^2 \theta - 1}{\operatorname{cosec} \theta + 1} =$:
 (A) 2 (B) $2 \cos^2 \theta$ (C) $2 \operatorname{cosec} \theta$ (D) $2 \tan^2 \theta$

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

30. If α and β are the zero s of a polynomial $p(x) = ax^2 + bx + c$ where $a \neq 0$ then, match the following :

Column-I

A. $\alpha^2 + \beta^2$

B. $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

C. $\frac{1}{\alpha^3} + \frac{1}{\beta^3}$

D. $\alpha^3 + \beta^3$

Column-II

1. $\frac{3abc - b^3}{c^3}$

2. $\frac{b^2 - 2ac}{ac}$

3. $\frac{b^2 - 2ac}{a^2}$

4. $\frac{3abc - b^3}{a^3}$

ANSWER

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