FIITJEE

Diagnostic cum Scholarship Tests

SAMPLE PAPER

For Students of Class XI

Paper 3 JEE Advanced

Duration : 90 minutes

Paper Code: 1011-3

Maximum Marks : 135

Please read the instructions and guidelines carefully :

Important Note : Please ensure to accurately input the details for the Question Paper Code as indicated at the top of this sheet (Side 2) into the corresponding columns / fields on the OMR sheet before proceeding with the paper. Incorrectly filled information regarding the class or paper may result in inaccurate outcomes or results.

"This paper has been scientifically designed to evaluate your potential – manifested and hidden for the target examinations mentioned in various sections of the paper. Thus, your adherence to the instructions is critical in the evaluation of the same"

1. This Question paper consist only 1 section.
2. Student should devote allotted time for each section. If a section is easy, then it is easy for everyone & was meant to be like that with a goal in mind. Do not switch over to another section if you find the section to be easy. If a section is tough, then it is tough for everyone. You are advised to spend 90 Minutes on Section-I. This adherence is crucial for assessing your true potential, as this section is meticulously crafted to evaluate your potential for the corresponding competitive examination.
3. Sheets will be given to each candidate for rough work. Candidate must fill all details on the rough sheet and submit the same to invigilator along with OMR sheet. Candidate must mention the Question No. while doing the rough work in the sheet.
4. Please note candidates are not allowed to bring any prohibited items into the exam hall such as electronic devices, mobile phones, smart watch, earphones, calculators, books, notes, formula sheets, and bags.
5. Marking scheme is given in table below:

Section	Subject		Question no.	Marking Scheme for each question	
				Correct answer	Wrong answer
SECTION – I **JEE Advanced** **Time Allotted: 90 Minutes**	PHYSICS	(PART-A)	1 to 3	**+3**	**–1**
	CHEMISTRY	(PART-B)	4 to 6	**+3**	**–1**
	MATHEMATICS	(PART-C)	7 to 9	**+3**	**–1**
	PHYSICS	(PART-D)	10 to 11	**+4** *Partial Marking	**–2**
	CHEMISTRY	(PART-E)	12 to 13	**+4** *Partial Marking	**–2**
	MATHEMATICS	(PART-F)	14 to 15	**+4** *Partial Marking	**–2**
	PHYSICS	(PART-G)	16 to 22	**+4**	**–1**
	CHEMISTRY	(PART-H)	23 to 29	**+4**	**–1**
	MATHEMATICS	(PART-I)	30 to 36	**+4**	**–1**

*** Partial Marking: (Q. No. 10 to 15):**

Full Marks	**: +4**	If only (all) the correct option(s) is(are) chosen;
Partial Marks	**: +3**	If all the four options are correct but ONLY three options are chosen;
Partial Marks	**: +2**	If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks	**: +1**	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	**: 0**	If none of the options is chosen (i.e. the question is unanswered)
Negative Marks	**: -2**	In all other cases.

Section – I

Time: 90 Minutes

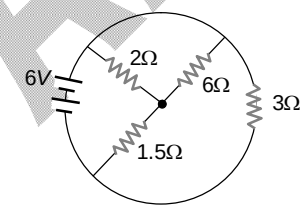
PHYSICS – (PART – A)

*This part contains **3 Multiple Choice Questions** number **1 to 3.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

1. An air bubble in a glass slab of refractive index 1.5 is 5 cm deep when viewed from one face and 2 cm deep when viewed from the opposite face. The thickness of the slab is
   (A) 10.5 cm (B) 7 cm
   (C) 10 cm (D) 7.5 cm

2. A person cannot see an object lying beyond 10 metres. The power of lens used to rectify this defect will be
   (A) + 0.1 D (B) + 0.2 D
   (C) – 0.2 D (D) – 0.1 D

3. The total current supplied to the circuit by the battery is
   (A) 1 A
   (B) 2 A
   (C) 4 A
   (D) 6 A



CHEMISTRY – (PART – B)

*This part contains **3 Multiple Choice Questions** number **4 to 6.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

4. In the compound,
   $CH_2 = CH – CH_2 – CH_2 – C \equiv CH$, the $C_2 – C_3$ bond is of the type
   (A) $sp – sp^2$ (B) $sp^3 – sp^3$
   (C) $sp – sp^3$ (D) $sp^2 – sp^3$

5. The pH of a solution of hydrochloric acid is 4. The molarity of the solution is
   (A) 4.0 (B) 0.4
   (C) 0.0001 (D) 0.04

6. The isomerism exhibited by n-propyl alcohol and isopropyl alcohol is
   (A) Metamerism (B) Position isomerism
   (C) Functional isomerism (D) Optical isomerism

MATHEMATICS – (PART – C)

*This part contains **3 Multiple Choice Questions** number **7 to 9.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

7. If $\tan x + \tan^2 x + \tan^3 x = 1$ then the value of $2\cos^6 x - 2\cos^4 x + \cos^2 x$ equals to
   (A) 1/2 (B) 2
   (C) 1 (D) none of these

8. If y, x, z are in A.P., then 2^{x+y}, 2^{y+z}, 2^{x+z} are in
   (A) A.P. (B) G.P.
   (C) H.P. (D) none of these

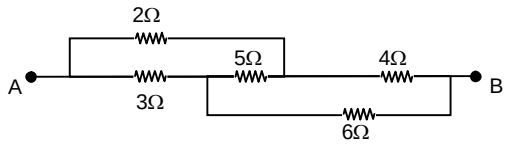
9. If $(x+1)^2 + \frac{1}{(x+1)(x+2)-(x-1)} = 0$. Then the value of $4x^3 + 8x + 11$ is
   (A) 7 (B) 9
   (C) 3 (D) 5

PHYSICS – (PART – D)

*This part contains **2 Multiple Choice Multi Correct Type Questions** number **10 to 11.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE** is/are correct.*

10. A convex lens and a concave lens, each having same focal length of 25 cm, are put in contact to form a combination of lenses. Then, which is/are correct about combination of lenses?
   (A) Power is zero (B) Focal length is infinity
   (C) Power is infinity (D) Focal length is zero

11. In the circuit shown in the figure. Same potential is applied at A and B. The equivalent resistance between A and B is R then:



   (A) No current flows through 5 ohm resistor (B) R = 15 ohm
   (C) R = 12.5 ohm (D) R = 18/5 ohm

CHEMISTRY – (PART – E)

*This part contains **2 Multiple Choice Multi Correct Type Questions** number **12 to 13.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE** is/are correct.*

12. What is the oxidation number of two different nitrogen in NH_4NO_3?
   (A) -3 (B) 3
   (C) 5 (D) -5

13. Which disproportionates on heating with NaOH?
   (A) P_4 (B) S
   (C) Cl_2 (D) None of these

MATHEMATICS – (PART – F)

*This part contains **2 Multiple Choice Multi Correct Type Questions** number **14 to 15.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE** is/are correct.*

14. Points R (h, k) divides the line segment AB beween the axes in the ratio 1 : 2 where A lies on the X-axis and the point B is higher than the A. Find the equation(s) of the line AB.
(A) $2kx + hy = 3hk$ (B) $2hx + ky = 3hk$
(C) $2hx + ky = -3hk$ (D) $2kx + hy = -3hk$

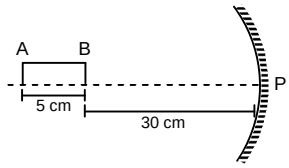
15. If the value of a quadratic polynomical P(x) is 0 only at x = –1 and P(–2) = 2, then 32 is the value of
(A) $P(3)$ (B) $P(4)$
(C) $P(-4)$ (D) $P(-5)$

PHYSICS – (PART – G)

*This part contains **ONE (01)** comprehension**.** Based on comprehension, there are **THREE (03)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension–1 for Q. No. 16 to 18

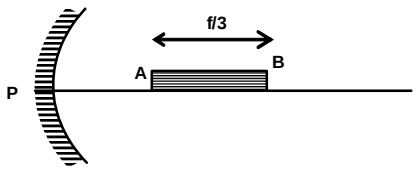
A thin rod of length 5 cm lies along the principal axis of the concave mirror of focal length 15 cm in such a way that the end closer to the pole is 30 cm away from it (as shown in figure)



16. Find the distance of image of 'A' from pole 'P'.
(A) 20.25 (B) 22.5
(C) 35 (D) 26.25

17. Find the distance of image of 'B' from pole 'P'.
(A) 20 cm (B) 30 cm
(C) 15 cm (D) 10 cm

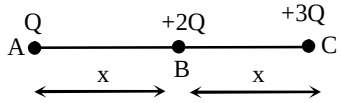
18. A thin rod of length f/3 is placed along the optic axis of a concave mirror of focal length f such that its image, which is real and diminished, just, touches the rod. Centre of curvature is at
(A) A
(B) B
(C) between A and B
(D) between A and P



*This part contains **TWO (02)** comprehensions. Based on each comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension–1 for Q. No. 19 to 20

The charges of value Q, +2Q, +3Q are placed at point A, B, and C respectively.



19. Find the force on charge A:

(A) $\frac{9}{4}\frac{KQ^2}{x^2}$ (B) $\frac{10}{4}\frac{KQ^2}{x^2}$

(C) $\frac{11}{4}\frac{KQ^2}{x^2}$ (D) $\frac{13}{4}\frac{KQ^2}{x^2}$

20. Find the force on charge B:

(A) $5\frac{KQ^2}{x^2}$ (B) $6\frac{KQ^2}{x^2}$

(C) $7\frac{KQ^2}{x^2}$ (D) $4\frac{KQ^2}{x^2}$

Comprehension–2 for Q. No. 21 to 22

Force on a particle having charge q placed in an electric field is given by $\vec{F} = q\vec{E}$, force is in the direction of electric field it charge is positive. The particle having charge q & mass m placed in region having magnetic field towards +x direction & electric field towards +y direction (gravity free zone).

21. If particle having charge q is placed at origin, its force due to electric field will be towards
(A) +y direction (B) - y direction
(C) +x direction (D) depends upon nature of charge

22. If particle is moving is a with constant velocity, then it follows:
(A) qvB = E (B) Eq = vB
(C) E = vB (D) E = 2eBv

CHEMISTRY– (PART – H)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **THREE (03)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension–1 for Q. No. 23 to 25

Two or more than two compounds may have same molecular formula but different properties these compounds are called isomers and phenomenon is called isomerism. It may be structural or stereo isomerism. It may be structural or stereo isomerism. Structural may be further of chain position, functional, metamerism ring-chain or tautomerism

23. Number of isomers represented by molecular formula $C_4H_{10}O$ is
(A) 7 (B) 6
(C) 4 (D) 3

24. Which of the following shows functional isomerism?
(A) CH_3CH_2Cl and CH_3CH_2Br (B) CH_3CHBr_2 and CH_2BrCH_2Br
(C) $C_2H_5OC_2H_5$ and $CH_3OC_3H_7$ (D) CH_3CH_2CHO and CH_3COCH_3

25. But-1-ene and cyclobutane exhibit:
(A) ring-chain isomerism (B) position isomerism
(C) tautomerism (D) functional isomerism

*This part contains **TWO (02)** comprehensions**.** Based on each comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension–1 for Q. No. 26 to 27

When the metal carbonates and hydrogen carbonates react with the acids, they produce salt and water and liberate the carbon dioxide gas.
Metal carbonates + Acid $\rightarrow$ salt + carbon dioxide + water

26. A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains:
(A) NaCl (B) HCl
(C) LiCl (D) KCl

27. A student dropped few pieces of marbles in acetic acid contained in a test tube. The evolved gas was then passed through lime water in excess, then what will you observe?
(A) Lime water become milk (B) Milkyness will disappear
(C) No change (D) None of these

Comprehension–2 for Q. No. 28 to 29

The phenomenon of existence of a chemical element to exist in two or more form differing in physical properties but having almost same chemical nature is known as allotropy. This phenomenon is due to the difference either in the number of atoms in the molecules or arrangement of atoms in the molecules in the crystal structure. Except lead, all other members of group 14 exhibit allotropy carbon exists as diamond, graphite, coal, charcoal, lampblack and fullerene. Silicon exists in two forms crystalline and amorphous

28. Carbon atoms in diamond are bonded with each other in a shape
(A) linear (B) planar
(C) octahedral (D) tetrahedral

29. C – C bond length is maximum in
(A) diamond (B) graphite
(C) naphthalene (D) fullerene

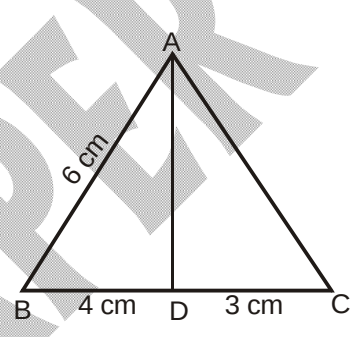
MATHEMATICS – (PART – I)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **THREE (03)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

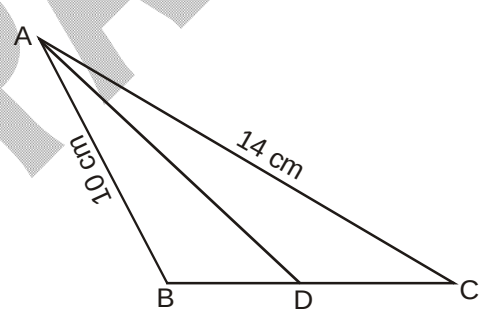
Comprehension–1 for Q. No. 30 to 32

The internal / external bisector of an angle of a triangle divides the opposite side internally / externally in the ratio of the side containing the angle.

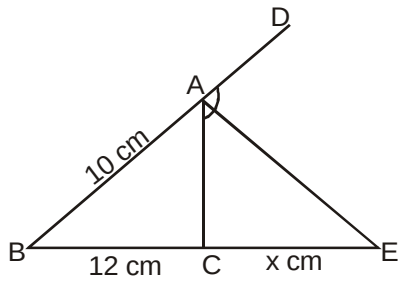
30. In the given figure, AD is the bisector of $\angle A$. If BD = 4 cm, DC = 3 cm and AB = 6 cm determine AC.
(A) 4.5 cm (B) 3.5 cm
(C) 4.8 cm (D) 3.2 cm



31. In the given figure AD is the bisector of $\angle BAC$. If AB = 10 cm, AC = 14 cm, and BC = 6 cm. Find BD and DC.
(A) 3.5 cm, 2.5 cm
(B) 2.5 cm, 3.5 cm
(C) 4.5 cm, 3.5 cm
(D) 3.5 cm, 4.5 cm



32. In the given figure AE is the bisector of the exterior $\angle CAD$ meeting BC produced in E. If AB = 10 cm, AC = 6 cm and BC = 12 cm. Find CE.
(A) 12 cm
(B) 16 cm
(C) 20 cm
(D) 18 cm



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Comprehension–1 for Q. No. 33 to 34

$(-5,-10)$, $(-15,15)$, $(5,5)$ are the coordinates of vertices A, B and C respectively of ΔABC, and P is a point on median AD such that $AP : PD = 2 : 3$

33. The coordinates of point D is

(A) $(5, 10)$ (B) $(-5, -10)$

(C) $(5, -10)$ (D) $(-5, 10)$

34. The coordinates of point P is

(A) $(-5, -2)$ (B) $\left(\frac{10}{3}, 5\right)$

(C) $\left(\frac{10}{3}, \frac{5}{3}\right)$ (D) None of these

Comprehension–2 for Q. No. 35 to 36

$f(x) = a_0 + a_1 x + a_2x^2+\ldots\ldots+a_n x^n$ is divided by (x–k), then remainder is is f(k).

35. The remainder when x^{2014} is divided by x^2-1

(A) 1 (B) –1

(C) x + 1 (D) x – 1

36. The remainder when x^{2014} is divided by x^2-3x+2 is

(A) 2014 (B) 2014x – 2013

(C) $(2^{2014}-2)x + (2-2^{2014})$ (D) $(2^{2014}-1)x + (2-2^{2014})$

FIITJEE

Diagnostic cum Scholarship Tests

SAMPLE PAPER

For Students of Class XI

Paper 3 JEE Advanced

Paper Code: 1011-3

ANSWER KEY

1.	**A**	2.	**D**	3.	**C**	4.	**D**
5.	**C**	6.	**B**	7.	**A**	8.	**B**
9.	**C**	10.	**A, B**	11.	**A, D**	12.	**A, C**
13.	**A, B, C**	14.	**A, D**	15.	**A, D**	16.	**D**
17.	**B**	18.	**A**	19.	**C**	20.	**D**
21.	**D**	22.	**C**	23.	**A**	24.	**D**
25.	**A**	26.	**B**	27.	**B**	28.	**D**
29.	**A**	30.	**A**	31.	**B**	32.	**D**
33.	**D**	34.	**A**	35.	**A**	36.	**D**