

FIITJEE INTERNAL TEST

Batches: Udaya Two Year (1921) & Udaya One Year (2021)

PHASE – VII & III

QP CODE:

Time : 1 ½ hours

Maximum Marks : 90

Scholastic Aptitude Test

Instructions

- The question paper consists of **90** multiple choice questions divided into four sections.
Section – I contains **45** questions of **Mathematics**.
Section – II contains **15** questions of **Physics**.
Section – III contains **15** questions of **Chemistry**.
Section – IV contains **15** questions of **Biology**.
- Each question carries **+1** marks.
- There is **No negative** marking.
- Attempt **All** questions.
- Use of Calculator is **NOT PERMITTED**.
- All symbols have their usual meanings, if not mentioned in the question.
- The Question Paper contains blank spaces for your rough work.
No additional sheets will be provided for rough work.
- This booklet also contains **OMR** answer sheet.

Name of the Candidate :

Enrollment Number :

SECTION – I

Mathematics

1. If $(x - 2y) = 3$, then $x^3 - 8y^3 - 18xy$ is equal to
 (A) 81 (B) 25 (C) 27 (D) none of these
 1. C
2. $\frac{x^2}{16} + 4y^2 + xy$ is equal to
 (A) $\left(\frac{x+2y}{16}\right)^2$ (B) $\left(\frac{x+8y}{4}\right)^2$ (C) $\left(\frac{x+4y}{4}\right)^2$ (D) none of these
 2. B
3. $37^2 - 13^2 = 15x$ then the value of $x + \frac{x}{2} + \frac{x}{5} + \frac{x}{16} + \frac{x}{40} + \frac{x}{80}$ is
 (A) 144 (B) 160
 (C) 380 (D) none of these
 3. A
4. After allowing a discount of 12% on the marked price of an article, It is sold for Rs. 880 then it's marked price =
 (A) Rs. 1200 (B) Rs. 1400
 (C) Rs. 1100 (D) Rs. 1000
 4. D
5. If the C.P. of 25 chairs is equal to the S.P. of 30 chairs, then the loss percent is
 (A) $16\frac{2}{3}\%$ (B) 16%
 (C) 15% (D) 14%
 5. A
6. The rate at which a sum becomes four times of itself in 15 years at simple interest, will be
 (A) 15% (B) 17.5%
 (C) 20% (D) 25%
 6. C
7. $\left[3^{(3^3)}\right]^{\frac{1}{3}} = ?$
 (A) 3^3 (B) 3^{9^3}
 (C) 3^{3^9} (D) 3^9
 7. D
8. If $\left(\frac{1}{5}\right)^{3y} = 0.008$ then value of $(0.25)^y =$
 (A) 0.5 (B) 0.25
 (C) 0.75 (D) 0.125
 8. B

9. Sara gains 10% on selling a pen. If she sells it at double the price, then profit percent is :
 (A) 120% (B) 60%
 (C) 100% (D) 200%
9. A
10. The product of $(x^2 + x + 1)$ and $(x^2 - x + 1)$ is equal to
 (A) $x^4 - x^2 - 1$ (B) $x^4 + x^2 + 1$
 (C) $x^4 + 2x^2 + 1$ (D) None of these
10. B
11. $\left(x^2 - \frac{1}{x^2}\right)\left(x^2 + \frac{1}{x^2}\right) = ?$
 (A) $x^4 + \frac{1}{x^4} - 2$ (B) $x^4 + \frac{1}{x^4} + 2$
 (C) $x^4 + \frac{1}{x^4}$ (D) $x^4 - \frac{1}{x^4}$
11. D
12. If $a : b = 4 : 9$ and $b : c = 3 : 5$, then $a : b : c$.
 (A) 4 : 9 : 15 (B) 4 : 9 : 10
 (C) 4 : 9 : 25 (D) 4 : 9 : 20
12. A
13. If $x\%$ of y is same as $\frac{4}{5}$ of 80, then the value of xy is:
 (A) 3200 (B) 4000
 (C) 6400 (D) None of these
13. C
14. By selling an article for Rs. 100, a man gains Rs. 15. Then, his gain% is :
 (A) 15% (B) $12\frac{2}{3}\%$
 (C) $17\frac{11}{17}\%$ (D) $17\frac{1}{4}\%$
14. C
15. If Rs. 782 be divided into three parts, proportional to $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$, then the first part is:
 (A) Rs. 182 (B) Rs. 190
 (C) Rs. 196 (D) Rs. 204
15. D
16. $\sqrt[5]{ab^{-1}} \times \sqrt[5]{bc^{-1}} \times \sqrt[5]{ca^{-1}} = ?$
 (A) $\sqrt[5]{abc}$ (B) $\sqrt[5]{\frac{1}{abc}}$
 (C) 1 (D) None of these
16. C
17. If $\left(\frac{9}{4}\right)^x \cdot \left(\frac{8}{27}\right)^{x-1} = \frac{2}{3}$, then the value of x is:
 (A) 1 (B) 2
 (C) 3 (D) 4

17. D
18. $9x^2 + y^2 + 4z^2 + 6xy - 4yz - 12xz = ?$
 (A) $(3x - y - 2z)^2$ (B) $(3x - y + 2z)^2$
 (C) $(-3x - y - 2z)^2$ (D) $(3x + y - 2z)^2$
18. D
19. $(x^{1/3} - y^{1/3})(x^{1/3} + y^{1/3})(x^{2/3} + y^{2/3}) = ?$
 (A) $x^{4/3} + y^{4/3}$ (B) $x^{4/3} - y^{4/3}$
 (C) $x^{2/3} - y^{2/3}$ (D) $x - y$
19. B
20. Punit is 25% older than his younger brother Jasmeet. By what percentage Jasmeet is younger than Punit?
 (A) 20% (B) 10%
 (C) 25% (D) Data insufficient
20. A
21. $\left(3^{\frac{1}{3}} - 1\right)\left(3^{\frac{2}{3}} + 3^{\frac{1}{3}} + 1\right) = ?$
 (A) $3^{\frac{2}{3}}$ (B) 3
 (C) 2 (D) $2^{\frac{1}{3}}$
21. C
22. The remainder when $12x^3 - 13x^2 - 5x + 9$ is divided by $(3x + 2)$ is
 (A) 1 (B) 2
 (C) 3 (D) 4
22. C
23. Find the value of $\frac{6^{\frac{2}{3}} \times \sqrt[3]{6^7}}{\sqrt[3]{6^6}}$.
 (A) 6 (B) 36
 (C) $\sqrt{6}$ (D) $\sqrt[3]{6}$
23. A
24. The factors of $1 - 6z + 9z^2$ are:
 (A) $(1 + 3z)(1 - 3z)$ (B) $(z + 3)^2$
 (C) $(3z - 1)^2$ (D) $(z - 3)^2$
24. C
25. The value of $(x^{b+c})^{b-c} (x^{c+a})^{c-a} (x^{a+b})^{a-b}$, $(x \neq 0)$ is :
 (A) 1 (B) 2
 (C) -1 (D) 0
25. A

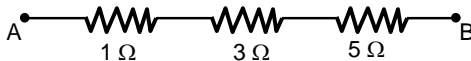
26. A person sells two machines at Rs. 396 each. On one he gains 10% and on the other he loses 10%. His profit or loss in the whole transaction is:
 (A) no gain no loss (B) 1% loss
 (C) 1% profit (D) 8% profit
26. B
27. $(16^{0.16} \times 2^{0.36})$ is equal to:
 (A) 2 (B) 16
 (C) 32 (D) 64
27. A
28. $(y - z)^3 + (z - x)^3 + (x - y)^3$ is equal to:
 (A) $3(y - z)(z + x)(y - x)$ (B) $3(x - y)(y + z)(x - z)$
 (C) $3(y - z)(z - x)(x - y)$ (D) $(y - z)(z - x)(x - y)$
28. C
29. If $p = 999$, then the value of $\sqrt[3]{p(p^2 + 3p + 3) + 1}$ is:
 (A) 1000 (B) 999
 (C) 998 (D) 1002
29. A
30. If $(\sqrt{5})^7 \div (\sqrt{5})^5 = 5^p$, then the value of p is:
 (A) 5 (B) 2
 (C) $\frac{3}{2}$ (D) 1
30. D
31. Sara deposited Rs. 29400 for 6 years at a simple interest. She got Rs. 4200 as interest after 6 years. The annual rate of interest was:
 (A) $2\frac{8}{21}\%$ (B) $2\frac{7}{20}\%$
 (C) $3\frac{8}{21}\%$ (D) $4\frac{8}{21}\%$
31. A
32. Simplify: $\left[64^{\frac{2}{3}} \times 2^{-2} \div 8^0\right]^{\frac{1}{2}}$
 (A) 0 (B) 1
 (C) 2 (D) $\frac{1}{2}$
32. C
33. If the monthly salary of an employee is increased by $2\frac{2}{3}\%$, he gets 72 rupees more. His monthly salary (in rupees) is:
 (A) 7200 (B) 3600
 (C) 2700 (D) 2000
33. C

34. The factors of $5x^2 - 19x + 12$ are:
 (A) $(5x - 4)(x - 3)$ (B) $(5x - 4)(x + 3)$
 (C) $(x + 2)(5x - 1)$ (D) $(5x - 6)(x - 1)$
34. A
35. If $3x = 5y = 4z$ then $x : y : z$ is equals to:
 (A) $9 : 12 : 16$ (B) $20 : 12 : 15$ (C) $15 : 10 : 9$ (D) $8 : 5 : 3$
35. B
36. A radio is sold for Rs. 990 at a profit of 10%. What would have been the actual profit or loss on it, had it been sold for Rs. 890?
 (A) Rs. 10 loss (B) Rs. 10 profit
 (C) Rs. 90 loss (D) Rs. 90 profit
36. A
37. If $x - \frac{1}{x} = 4$, then $\left(x + \frac{1}{x}\right)$ is equal to:
 (A) $5\sqrt{2}$ (B) $2\sqrt{5}$ (C) $4\sqrt{2}$ (D) $4\sqrt{5}$
37. B
38. If $x - y = 2$, $xy = 24$, then the value of $(x^2 + y^2)$ is:
 (A) 25 (B) 36 (C) 63 (D) 52
38. D
39. Simple interest on a certain sum for 6 years is $\frac{9}{25}$ of the sum. The rate of interest is:
 (A) 6% (B) $6\frac{1}{2}\%$ (C) 8% (D) $8\frac{1}{2}\%$
39. A
40. If $27^{2x-1} = (243)^3$, then the value of 'x' is :
 (A) 3 (B) 6 (C) 7 (D) 9
40. A
41. The factors of $(8a^3 + 125b^3 - 64c^3 + 120abc)$ are:
 (A) $(2a + 5b - 4c)(2a + 5b + 4c)$
 (B) $(2a - 5b - 4c)(2a + 5b + 4c)$
 (C) $(2a + 5b - 4c)(4a^2 + 25b^2 + 16c^2 - 10ab + 20bc + 8ac)$
 (D) $(2a + 5b + 4c)(4a^2 + 25b^2 + 16c^2 - 10ab + 20bc + 8ac)$
41. C
42. Find the discount in percent when M.P. = Rs. 900 and S.P. = Rs. 873
 (A) 3 (B) 4 (C) 5 (D) 6
42. A
43. Find the compound interest on Rs. 12000 for 3 years at 10% per annum compounded annually
 (A) Rs. 3975 (B) Rs. 3972
 (C) Rs. 3978 (D) None of these
43. B

44. Ramesh sells an article at profit of 10%. If the cost price of that article was 20 then find selling price.
(A) 21 (B) 22 (C) 23 (D) 24
44. B
45. Profit or loss percent are always calculated as percentage of
(A) C.P. (B) S.P. (C) M.P. (D) None of these
45. A

SECTION – II

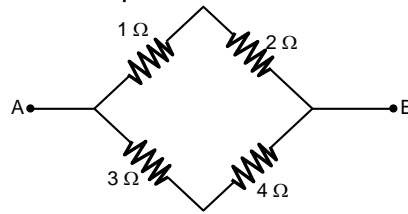
Physics

1. Resistivity of a wire depends upon
 (A) Shape of the wire (B) Size of the wire
 (C) Nature of material (D) All of these
 1. C
2. The slope of voltage (V) versus current (I) graph gives
 (A) Conductivity (B) Resistance
 (C) Resistivity (D) Electric power
 2. B
3. A block of weight 5 N is placed on a horizontal table. A person pushes the block from top by exerting a downward force of 3 N on it. The force exerted by the table on the block is
 (A) 5 N (B) 8 N
 (C) 0 N (D) None of these
 3. B
4. The process of depositing a layer of any desired metal on another metal or material by means of electricity is called
 (A) metallurgy (B) electroplating
 (C) electrification (D) none of these
 4. B
5. The direction of flow of electric current is
 (A) Same as the direction of flow of electrons
 (B) Opposite to the direction of flow of electrons
 (C) From low potential to high potential
 (D) None of these
 5. B
6. What is the equivalent resistance between the points A & B in the given circuit?


A — $1\ \Omega$ — $3\ \Omega$ — $5\ \Omega$ — B

 (A) $\frac{15}{23}\ \Omega$ (B) $\frac{23}{15}\ \Omega$
 (C) $1\ \Omega$ (D) $9\ \Omega$
 6. D
7. A body is in motion, we can conclude
 (A) net unbalanced force must be acting on body
 (B) force may be acting on body
 (C) net force acting on body must be zero
 (D) none of these
 7. B

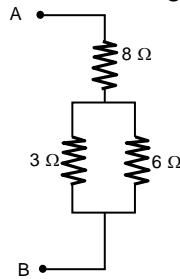
8. Equivalent resistance between the points A & B is



- (A) 1 Ω (B) 2.1 Ω
(C) 5.7 Ω (D) 10 Ω

8. B

9. The resistance between the points A & B in the given network is



- (A) 7 Ω (B) 10 Ω
(C) 17 Ω (D) 20 Ω

9. B

10. What is the maximum value of resistance obtained by connecting 3 resistors of value 3 Ω each?

- (A) 1 Ω (B) 3 Ω
(C) 9 Ω (D) 27 Ω

10. C

11. The instrument used to measure electric current in a circuit is

- (A) Ammeter (B) Voltmeter
(C) Rheostat (D) Galvanometer

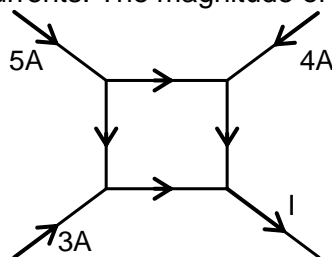
11. A

12. 1 Ohm equals

- (A) 1 volt (B) 1 ampere
(C) 1 volt/ampere (D) 1 ampere/volt

12. C

13. Figure shows a network of currents. The magnitude of current I will be



- (A) -2A (B) 4A
(C) 6A (D) 12A

13. D

14. The point on the surface of the earth vertically above the place of origin of an earthquake is

- (A) Focus (B) Epicentre
(C) Hypocentre (D) None of these

14. B

15. Which of the following is not an insulator?

(A) Air

(B) Wood

(C) Glass

(D) Gold

15. D

SECTION – III
Chemistry

1. Which of the following gas is mainly responsible for global warming?
(A) CO₂ (B) CO
(C) SO₂ (D) NO₂
1. A
2. A non-luminous flame is obtained when fuel is burnt:
(A) Partially (B) Completely (C) Occasionally (D) anytime
2. B
3. Which among the following allotrope of carbon is used to make lubricants?
(A) Diamond (B) Bucky ball (C) Graphite (D) None of these
3. C
4. Which of the following polymers is chemically least reactive thermally most stable?
(A) PVC (B) Teflon (C) Polythene (D) Nylon
4. B
5. Respiration is _____ reaction:
(A) Combustion (B) Carbonisation (C) Polymerisation (D) None of these
5. A
6. Disadvantages of traditional Chulla are:
(A) Only 90% of heat is utilized for cooking purposes.
(B) Only 10% of total heat is used for heating and cooking.
(C) It causes air pollution inside house.
(D) Both (B) and (C)
6. D
7. How much heat is released on complete combustion of two mol ethane as per the balanced chemical equation, $2\text{C}_2\text{H}_6 + 7\text{O}_2 \longrightarrow 4\text{CO}_2 + 6\text{H}_2\text{O} + 746 \text{ Kcal / mol}$?
(A) 746 kcal (B) 376 kJ (C) 1492 kJ (D) 6266 kJ
7. D
8. What are the values of a, b, c, d in following balanced chemical equation?
 $a\text{C}_4\text{H}_{10} + b\text{O}_2 \longrightarrow c\text{CO}_2 + d\text{H}_2\text{O}$
(A) 1, 10, 4, 5 (B) 2, 7, 4, 6
(C) 2, 13, 8, 10 (D) 3, 10, 12, 5
8. C
9. Marsh gas is another name for
(A) methane (B) butane
(C) CNG (D) LPG
9. A
10. The compound that absorbs carbon dioxide from air is
(A) Na₂CO₃ (B) NaOH
(C) NaNO₃ (D) NaCl
10. B
11. Which is not a constituent of the safety match head?
(A) Arsenic trisulphide (B) White phosphorus
(C) Antimony trisulphide (D) None of these

11. A
12. (I) Calorific value of hydrogen is less than methane.
(II) Methane is a hydrocarbon
(A) (I) is right but (II) is wrong (B) (I) is wrong but (II) is right
(C) (I) & (II) both are correct (D) (I) & (II) both are wrong
12. B
13. An unknown metal X when placed in copper sulphate solution gives a red brown precipitate. When placed in magnesium sulphate solution, gives no reaction. Identify element X.
(A) Sodium (B) Potassium
(C) Calcium (D) Iron
13. D
14. Match the following gases against their composition:
- | Column I | Column II |
|------------------|--|
| (1) Water gas | (p) $\text{CO} + \text{N}_2$ |
| (2) Producer gas | (q) CH_4 (major) |
| (3) Coal gas | (r) $\text{CO} + \text{H}_2$ |
| (4) Gobar gas | (s) $\text{CH}_4 + \text{CO} + \text{H}_2$ |
- (A) (1)-(s); (2)-(r); (3)-(p); (4)-(q)
(B) (1)-r; (2)-(p); (3)-(s); (4)-(q)
(C) (1)-(s); (2)-(r); (3)-(q); (4)-(p)
(D) (1)-r; (2)-(q); (3)-(s); (4)-(p)
14. B
15. Out of the following which fuels are more advantageous?
(A) Solid fuels (B) Liquid fuels
(C) Gaseous fuel (D) All of these
15. C

Space for rough work

SECTION – IV

Biology

1. Cell membrane is made up of:
 (A) Lipids & proteins (B) Lipids and carbohydrates
 (C) Carbohydrates & proteins (D) Carbohydrates, proteins & lipids

1. D
 Sol. Cell membrane is made up of carbohydrates, proteins & lipids.

2. Cell theory is not applicable to
 (A) Camel (B) Virus
 (C) Fungi (D) Lichens

2. B
 Sol. Cell theory is not applicable to virus.

3. Match the column-I with column-II

Column – I	Column – II
(p) Smooth endoplasmic reticulum	(i) Thylakoids
(q) Grana	(ii) Mitochondria
(r) Cristae	(iii) Lipid synthesis
(s) Rough endoplasmic reticulum	(iv) Protein synthesis
(A) (p)→(iii), (q)→(iv), (r)→(ii), (s)→(i)	(B) (p)→(v), (q)→(iv), (r)→(i), (s)→(ii)
(C) (p)→(iii), (q)→(i), (r)→(ii), (s)→(iv)	(D) (p)→(v), (q)→(iv), (r)→(ii), (s)→(i)

3. C
 Sol. Smooth endoplasmic reticulum → Lipid synthesis, Grana → Thylakoids, Cristae → Mitochondria, Rough endoplasmic reticulum → Protein synthesis.

4. Red Data Book provides data on
 (A) Red flowered plants (B) Red coloured fishes
 (C) Lists of plants and animals (D) Endangered plants & animals

4. D
 Sol. Red Data Book provides data on endangered plants & animals.

5. The undefined nuclear region of prokaryotes is also known as
 (A) Nucleus (B) Nucleolus
 (C) Nucleic acid (D) Nucleoid

5. D
 Sol. The undefined nuclear region of prokaryotes is also known as nucleoid.

6. Ribosomes are centres for
 (A) Photosynthesis (B) Respiration
 (C) Lipid synthesis (D) Protein synthesis

6. D
 Sol. Ribosomes are centres for protein synthesis.

7. Cell wall is composed of cellulose in
 (A) Bacteria (B) Fungi
 (C) Plants (D) All of these

7. C

Sol. Cell wall is composed of cellulose in plants.

8. Middle lamella is formed of
(A) Calcium pectate (B) Cellulose
(C) Hemicellulose (D) Lignin

8. A
Sol. Middle lamella is formed of calcium pectate.

9. Golgi apparatus help in:
(A) Modification and Packaging (B) Energy production
(C) Ribosome synthesis (D) Lipid synthesis

9. A
Sol. Golgi apparatus help in transportation.

10. Hydrolytic enzymes are present in:
(A) Ribosomes (B) Lysosomes
(C) Chromosomes (D) None of these

10. B
Sol. Hydrolytic enzymes are present in lysosomes.

11. The membrane that enclose a vacuole is
(A) Plasmalemma (B) Tonoplast
(C) Cell membrane (D) Middle lamella

11. B
Sol. The membrane that encloses a vacuole is tonoplast.

12. Cell theory was put forward by
(A) Schleiden and Schwann (B) Benda
(C) Watson and Crick (D) Robert Hooke

12. A
Sol. Cell theory was put forward by Schleiden and Schwann.

13. Thylakoids are present in:
(A) Mitochondria (B) Plastid
(C) Ribosomes (D) Lysosomes

13. B
Sol. Thylakoids are present in plastid.

14. The organelles called "power houses" or "energy store – houses" of a cell is
(A) Mitochondria (B) Golgi apparatus
(C) Ribosomes (D) Lysosomes

14. A
Sol. The organelles called "power houses" or "energy store – houses" of a cell is mitochondria.

15. The only cell organelle seen in prokaryotic cell
(A) Mitochondria (B) Ribosomes
(C) Plastids (D) Lysosomes

15. B
Sol. The only cell organelle seen in prokaryotic cell is ribosomes.

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PHASE – VII & III

QP CODE:

Scholastic Aptitude Test

Answer key

Physics

1.	C	2.	B	3.	B	4.	B
5.	B	6.	D	7.	B	8.	B
9.	B	10.	C	11.	A	12.	C
13.	D	14.	B	15.	D		