# FIITJEE INTERNAL TEST

## Batch: UDAYA425-VIII
### PHASE – 3
### QP CODE: 100828

Time : 1:30 Hrs. 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. The product of (2x + 3) (3x + 5) is _____.
   (A) $6x^2 + 9x + 15$ (B) $6x^2 + 19x + 5$
   (C) $6x^2 + 19x + 15$ (D) $9x^2 + 6x + 15$

2. Factorize the expression $p - q - p^2 + q^2$.
   (A) (p + q) [1 – (p + q)] (B) (p – q) [1 – (p + q)]
   (C) (p – q) [1 + (p + q)] (D) (p + q) [1 + (p + q)]

3. Evaluate: $(8)^{\frac{5}{3}} \div (8)^{\frac{8}{3}}$
   (A) 8 (B) 2 (C) $\frac{1}{8}$ (D) $\frac{1}{4}$

4. The abscissa of the point (5, 7) is ____.
   (A) 7 (B) 6
   (C) 2 (D) 5

5. The value of $(16)^3 + (-20)^3 + (4)^3$ is _____.
   (A) 3840 (B) –3840
   (C) –3680 (D) –3480

6. Factorize the expression $x^3 - 3x^2 + (x - 3)$.
   (A) $(x^2 + 1)(x - 3)$ (B) $(x^2 - 1)(x - 3)$
   (C) $(x^2 - 1)(x + 3)$ (D) $(x^2 + 1)(x + 3)$

7. The value of $(64)^{\frac{-2}{3}} \times (27)^{\frac{-2}{3}}$ is ____.
   (A) 144 (B) $\frac{1}{144}$ (C) 64 (D) $\frac{1}{64}$

8. The ordinate of the point (–2, –3) is ____.
   (A) –2 (B) –3
   (C) 1 (D) –5

*Space for rough work*

9. $\left(x-\frac{1}{x}\right)^2$ is equal to _____.

(A) $x^2-\frac{1}{x^2}$ (B) $x^2+\frac{1}{x^2}$

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

10. Evaluate 145 × 145 – 135 × 135

(A) 2200 (B) 2600

(C) 2800 (D) 3200

11. If $\left[\frac{\sqrt{16}}{3}\right]^x-1=\frac{7}{9}$, then x is _____.

(A) 0 (B) 1

(C) 2 (D) 3

12. Which of these points lie in 1st Quadrant?

(A) (–4, –3) (B) (4, –3)

(C) (–4, 3) (D) (4, 3)

13. If $x-\frac{1}{x}=3$, then the value of $x^2+\frac{1}{x^2}$ is _____.

(A) 9 (B) 16

(C) 13 (D) 11

14. The factors of $3x^2 - 13x + 14$ is _____.

(A) (3x + 7) (x + 2) (B) (3x + 7) (x – 2)

(C) (3x – 7) (x – 2) (D) (3x – 7) (x + 2)

15. The value of $(216)^{-2/3}$ is _____.

(A) $\frac{1}{36}$ (B) 18 (C) 36 (D) $\frac{1}{18}$

16. Which one of the following points lies on y-axis is _____.

(A) (5, 4) (B) (–2, 3)

(C) (0, 4) (D) (–5, 0)

*Space for rough work*

17. If $xy = 6$ and $x + y = 5$, then $x^2 + y^2$ is _____.
(A) 13 (B) 16
(C) 18 (D) 20

18. The L.C.M of polynomials $15x^2y^3z$, $3x^3yz^2$ is _____.
(A) $3x^3yz^2$ (B) $15x^3y^3z^2$
(C) $15x^2y^3z$ (D) $3x^2y^3z$

19. Find the value of $\left(\frac{1}{4}\right)^{-2} + \left(\frac{1}{3}\right)^{-3} + \left(\frac{1}{2}\right)^{-4}$.
(A) 95 (B) 49
(C) 91 (D) 59

20. The line $x = 5$ is parallel to y-axis which intersects x-axis at _____.
(A) (5, 1) (B) (1, 5)
(C) (5, 0) (D) (0, 5)

21. If $a - b = 2$, $ab = 15$, then the value of $a^3 - b^3$ is _____.
(A) 30 (B) 45
(C) 98 (D) 105

22. If $a - b = 3$ and $a^3 - b^3 = 117$, then the value of ab is _____.
(A) 5 (B) 9
(C) 10 (D) 11

23. If $(25)^{3/2} \times (125)^{4/3} = (5)^m$, then the value of m is _____.
(A) 5 (B) 7
(C) 10 (D) 15

24. The coordinates of the origin are ____.
(A) (1, 1) (B) (0, 0)
(C) (0, 1) (D) (1, 0)

25. If $ab + bc + ca = 4$ and $abc = 2$, then the value of $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$ is _____.
(A) –1 (B) 0
(C) 1 (D) 2

*Space for rough work*

26. The value of $(30)^3 + (20)^3 - (50)^3 + 90000$ is _____.
(A) 0 (B) –90000
(C) 1 (D) 2

27. The value of $\frac{x^{a+b} \cdot x^{b+c} \cdot x^{c+a}}{\left(x^a \cdot x^b \cdot x^c\right)^2}$ is _____.

(A) $(x)^2$ (B) $(x)^{a+b+c}$ (C) $(x)^{abc}$ (D) $(x)^0$

28. The reflection of the point (6, –7) across the x-axis is _____.
(A) (6, 7) (B) (6, –7)
(C) (–6, 7) (D) (–7, 6)

29. The value of b in the equation $(x + 6)(x + b) = x^2 + 2x - 24$ is _____.
(A) –4 (B) –2
(C) 2 (D) 4

30. Find the value of a if $(x - a)$ is a factor of $x^3 - a^2x + x + 2$.
(A) 2 (B) –2
(C) –3 (D) 4

31. The mixed radical $\sqrt[5]{486}$ can be expressed as _____.

(A) $3\sqrt[5]{2}$ (B) $4\sqrt[5]{2}$ (C) $3\sqrt{2}$ (D) $4\sqrt{2}$

32. The point where the two axes intersect is called _____.
(A) initial point (B) origin
(C) co-ordinate (D) none of these

33. The degree of a constant polynomial is _____.
(A) –1 (B) 0
(C) 1 (D) 2

34. Factorize: $\frac{ab^2}{2} - \frac{a^2b}{4}$

(A) ab (B) $a^2b^2$ (C) $ab\left[b - \frac{a}{2}\right]$ (D) $\frac{ab}{2}\left[b - \frac{a}{2}\right]$

*Space for rough work*

35. The standard form for 0.000064 is _____.
(A) $64 \times 10^{-4}$ (B) $64 \times 10^{5}$
(C) $6.4 \times 10^{5}$ (D) $6.4 \times 10^{-5}$

36. Which point will lie on line x + 2y = 6?
(A) (2, 1) (B) (0, 0)
(C) (2, 2) (D) (3, 2)

37. The H.C.F of the polynomials $6(x^2 - 36)$ and $36(x + 6)$ is _____.
(A) (x – 6) (B) (x + 6)
(C) 6(x – 6) (D) 6(x + 6)

38. The product of a rational number and its reciprocal is _____.
(A) 0 (B) –1
(C) not defined (D) 1

39. Pratap paid 20% of his salary as income tax. If he is left with ₹ 8400 after paying the tax, then find his salary.
(A) ₹ 11000 (B) ₹ 12500
(C) ₹ 10000 (D) ₹ 10500

40. The angles of a quadrilateral are in the ratio 2 : 3 : 6 : 7. The smallest angle is _____.
(A) 30° (B) 40° (C) 50° (D) 60°

41. If $x + \frac{1}{x} = \sqrt{5}$, then the value of $x^4 + \frac{1}{x^4}$ is _____.
(A) 10 (B) 8 (C) 7 (D) 25

42. The value of $\sqrt{\frac{(999)^2}{12321}}$ is _____.
(A) 9 (B) 13 (C) 17 (D) 19

43. The value of $\sqrt[3]{-1728}$ is _____.
(A) 13 (B) –13 (C) 12 (D) –12

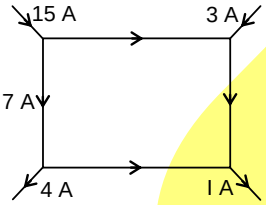
44. Find the mode of a data if its median is 12 and mean is 16.
(A) 4 (B) 8 (C) 6 (D) 12

45. If the sum of five consecutive numbers is 140, then the greatest number is _____.
(A) 29 (B) 30 (C) 31 (D) 32

*Space for rough work*

# SECTION – II
# PHYSICS

1. The value of current 'I' in the circuit shown in figure is _____.




(A) 13 A
(B) 11 A
(C) 6 A
(D) 14 A

2. Unit of electric current is
(A) Ammeter (B) Volt
(C) Ampere (D) Ohm

3. Which of the following is a longitudinal wave?
(A) Wave formed on a stretched string (B) Sound wave
(C) Light wave (D) All of these

4. A wire has resistance R. It is broken into two equal parts and these two parts are joined in parallel. The effective resistance is _____.
(A) R/2 (B) R/4
(C) 2 R (D) 4 R

5. A wire of resistivity $\rho$ is stretched to three times its original length. If its initial resistance is R, then, what will be its final resistance?
(A) $\frac{1}{3}$R (B) $\frac{1}{6}$R
(C) 9R (D) 3R

6. The method of purifying metals by passing electricity is called
(A) electrolysis (B) electroplating
(C) electrorefining (D) electrolyte

7. Electroplating is a
(A) Chemical effect of current (B) Heating effect of current
(C) Magnetic effect of current (D) None of these

8. Resistivity of a wire depends upon
(A) Shape of the wire (B) Size of the wire
(C) Nature of material of wire (D) All of these

*Space for rough work*

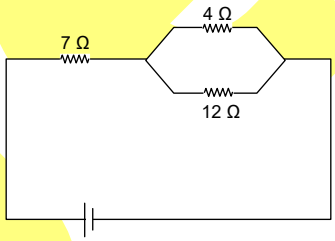
9. Two resistors of resistance 5 Ω and 10 Ω are connected to an electrical source. These resistances will have:
(A) Same current flowing through them when connected in parallel
(B) Same current flowing through them when connected in series
(C) Same potential difference across them when connected in series
(D) None of these

10. The potential difference required to pass a current of 0.5 A in a wire of resistance 20Ω is….
(A) 20 V (B) 10 V
(C) 5 V (D) 40 V

11. The point inside the earth at which a movement occurs and trigger an earthquake is called
(A) Dip (B) Epicentre
(C) Focus (D) Strike

12. The resistance of a bulb rated 80 W, 240 V is
(A) 240 Ω (B) 480 Ω
(C) 720 Ω (D) 960 Ω

13. What is the equivalent resistance in the given circuit?
(A) 23 Ω
(B) 10 Ω
(C) 21 Ω
(D) 75 Ω




14. Which of the following is caused due to the accumulation of charges in clouds
(A) lightning (B) charging
(C) rubbing (D) raining

15. The electrical energy consumed by a 30 W bulb in 5 minutes is _____.
(A) 9000 KJ (B) 9 KJ
(C) 9000 MJ (D) 9 MJ

*Space for rough work*

# SECTION – III
# CHEMISTRY

1. Combustion is not possible without
   (A) light (B) energy
   (C) oxygen (D) water

2. Charcoal is prepared from wood, in a closed vessel by
   (A) strong heating, in presence of air (B) strong heating, in absence of air
   (C) cooling, in absence of air (D) cooling, in presence of air

3. Which among the following is most ductile material?
   (A) Silver (B) Copper
   (C) Iron (D) Aluminium

4. Which among the following allotrope of carbon is used to make lubricants?
   (A) Diamond (B) Bucky ball
   (C) Graphite (D) None of these

5. Which of the following is called water gas?
   (A) $CO + H_2$ (B) $CO_2 + H_2O$
   (C) $CO + H_2O$ (D) $CO + CO_2$

6. Which gas is responsible for global warming?
   (A) $CO_2$ (B) $N_2$
   (C) $O_2$ (D) $Cl_2$

7. Zone of candle flame which is moderately hot is called:
   (A) Non-luminous zone (B) Luminous zone
   (C) Inner dark zone (D) Lowest blue zone

8. Which is not a natural solid fuel?
   (A) coke (B) Charcoal
   (C) LPG (D) Coal

9. Which is not a suitable fire extinguisher for oil?
   (A) cold water (B) $CO_2$
   (C) hot water (D) Both (A) and (C)

10. The amount of heat produced when one kg of a fuel burns completely is its:
    (A) Calorimetry (B) Calorific value
    (C) Ignition value (D) None of these

*Space for rough work*

11. Which of the following chemical can be used to extinguish fire?
(A) Bitumen (B) Washing soda
(C) Baking soda (D) Plaster of paris

12. Which among the following fraction of fractional distillation of petroleum produced at lowest temperature?
(A) Kerosene (B) Diesel
(C) Asphalt (D) Fuel Oil

13. Combustion of coke produces
(A) flames (B) no flames
(C) sound (D) none of these

14. Which among the following is purest form of carbon?
(A) Coke (B) Peat coal
(C) Wood charcoal (D) None of these

15. Anaerobic fermentation of cattle dung produces
(A) biogas (B) natural gas
(C) petroleum gas (D) kerosene

## SECTION – IV
## BIOLOGY

1. Name a cell found in humans but devoid of nucleus in its mature state:
(A) WBC (B) RBC
(C) Neurons (D) All of the above

2. Living cells were discovered by
(A) Robert Hooke (B) Purkinje
(C) Leeuwenhoek (D) Robert Brown

3. The only cell organelle seen in prokaryotic cell is:
(A) mitochondria (B) ribosomes
(C) plastids (D) lysosomes

4. The covering of the cell that separates the content of the cell from its external environment is called:
(A) cell wall (B) cytoplasm
(C) cell membrane (D) nucleus

5. The nucleus has a double layered covering called
(A) cell membrane (B) nuclear membrane
(C) cell wall (D) plasma membrane

*Space for rough work*

6. Cell wall is made up of:
(A) Lipids (B) Proteins
(C) Carbohydrates (D) Cellulose

7. Power house of the cell is:
(A) Plastid (B) Ribosome
(C) Mitochondria (D) Lysosome

8. Hen's egg is an example of:
(A) Tissue (B) Organ
(C) Organ system (D) Cell

9. Golgi apparatus helps in:
(A) Transport (B) Secretion
(C) Energy production (D) Both (A) and (B)

10. Green colour of leaves is due to presence of the pigment _____
(A) chlorophyll (B) ribosomes
(C) mitochondria (D) chloroplast

11. Intercellular connections in plant cells are called
(A) middle lamella (B) microfibrils
(C) matrix (D) plasmodesmata

12. The infoldings in mitochondria are known as
(A) cristae (B) matrix
(C) thylakaid (D) grana

13. Single celled organisms are called
(A) Unicellular (B) Multi-cellular
(C) Both of these (D) None of these

14. Of the following parts of a cell listed below, name the part that is common to plant cell, animal cell and a bacterial cell.
(A) Chloroplast (B) Cell wall
(C) Cell membrane (D) Nucleus

15. The thread-like structures present in the nucleus are
(A) Nucleolus (B) Chromosomes
(C) Genes (D) Ribosomes

*Space for rough work*

# QP CODE: 100828

# Scholastic Aptitude Test

# ANSWER

## MATHEMATICS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | C | 2. | B | 3. | C | 4. | D |
| 5. | B | 6. | A | 7. | B | 8. | B |
| 9. | D | 10. | C | 11. | C | 12. | D |
| 13. | D | 14. | C | 15. | A | 16. | C |
| 17. | A | 18. | B | 19. | D | 20. | C |
| 21. | C | 22. | C | 23. | B | 24. | B |
| 25. | D | 26. | A | 27. | D | 28. | A |
| 29. | A | 30. | B | 31. | A | 32. | B |
| 33. | B | 34. | D | 35. | D | 36. | C |
| 37. | D | 38. | D | 39. | D | 40. | B |
| 41. | C | 42. | A | 43. | D | 44. | A |
| 45. | B | | | | | | |

## PHYSICS

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

## CHEMISTRY

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

## BIOLOGY

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

# Hints & Solutions

## MATHEMATICS

1. **C**

Sol. $(2x + 3)(3x + 5)$
$= 6x^2 + 19x + 15$

2. **B**

Sol. $p - q - p^2 + q^2$
$= (p - q) - (p^2 - q^2)$
$= (p - q)[1 - (p + q)]$

3. **C**

Sol. $(8)^{\frac{5}{3}-\frac{8}{3}} = (8)^{\frac{-3}{3}} = (8)^{-1} = \frac{1}{8}$

4. **D**

Sol. Abscissa of the point (5, 7) is **5**.

5. **B**

Sol. Here, $16 - 20 + 4 = 0$
$\therefore (16)^3 + (-20)^3 + (4)^3 = 3 \times 16 \times (-20) \times 4$
$= -3840$

6. **A**

Sol. $x^2(x - 3) + (x - 3)$
$(x^2 + 1)(x - 3)$

7. **B**

Sol. $(64 \times 27)^{\frac{-2}{3}}$

$= \left[(4)^3 \times (3)^3\right]^{\frac{-2}{3}}$

$= \left[(4 \times 3)^3\right]^{\frac{-2}{3}}$

$= \left[(12)^3\right]^{\frac{-2}{3}}$

$= (12)^{-2}$

$= \frac{1}{144}$

8. **B**

Sol. The ordinate of the point (–2, –3) is –3.

9. **D**

Sol. $\left(x - \frac{1}{x}\right)^2 = x^2 - 2x \cdot \frac{1}{x} + \frac{1}{x^2}$

$= x^2 - 2 + \frac{1}{x^2}$

10. **C**

Sol. $(145)^2 - (135)^2$
$(145 + 135)(145 - 135)$
$(280)(10)$

= 2800

11. **C**

Sol. $\left[\frac{\sqrt{16}}{3}\right]^x = \frac{7}{9} + 1$

$\left[\frac{\sqrt{16}}{3}\right]^x = \left(\frac{\sqrt{16}}{3}\right)^2$

$\therefore x = 2$

12. **D**

Sol. **(4, 3)** lies in 1st Quadrant.

13. **D**

Sol. $\left(x + \frac{1}{x}\right)^2 = \left(x - \frac{1}{x}\right)^2 - 2 \cdot x \cdot \frac{1}{x}$

$= (3)^2 + 2$

$= 11$

14. **C**

Sol. $3x^2 - 6x - 7x + 14$

$= 3x(x - 2) - 7(x - 2)$

$= (3x - 7)(x - 2)$

15. **A**

Sol. $(216)^{-2/3} = \left(\frac{1}{6^3}\right)^{2/3} = \frac{1}{36}$

16. **C**

Sol. **(0, 4)** lies on y-axis

17. **A**

Sol. $x^2 + y^2 = (x + y)^2 - 2xy$

$= (5)^2 - 2(6)$

$= 13$

18. **B**

Sol. L.C.M of polynomials $15x^2y^3z$, $3x^3yz^2 = 15x^3y^3z^2$

19. **D**

Sol. $(4)^2 + (3)^3 + (2)^4$

$= 59$

20. **C**

Sol. When the line x = 5 intersects x-axis then y-coordinate will be zero.

21. **C**

Sol. $a^3 - b^3 = (a - b)^3 + 3ab(a - b)$

$= (2)^3 + 3(15)(2)$

$= 98$

22. **C**

Sol. $(a - b)^3 = (3)^3$

$a^3 - b^3 - 3ab(a - b) = 27$

$117 - 3ab(3) = 27$
$ab = 10$

23. **B**
Sol. $(5)^3 \times (5)^4 = (5)^m$
$m = 7$

24. **B**
Sol. The coordinates of the origin are (0, 0).

25. **D**
Sol. $\frac{ab+bc+ca}{abc} = \frac{4}{2} = 2$

26. **A**
Sol. $\because$ 30 + 20 – 50 = 0
$\therefore (30)^3 + (20)^3 - (50)^3 + 90000 = 3(30)(20)(-50) + 9000$
$= -9000 + 9000$
$= 0$

27. **D**
Sol. $\frac{x^{a+b+b+c+c+a}}{(x)^{2a+2b+2c}} = (x)^{2a+2b+2c-2a-2b-2c}$
$= (x)^0$

28. **A**
Sol. Reflected point is **(6, 7)**

29. **A**
Sol. $x^2 + bx + 6x + 6b = x^2 + 2x - 24$
On comparing $6b = -24$
$b = -4$

30. **B**
Sol. put x = a
$f(a) = (a)^3 - a^2(a) + a + 2 = 0$
$a = -2$

31. **A**
Sol. $\sqrt[5]{486} = \sqrt[5]{2 \times 3 \times 3 \times 3 \times 3 \times 3}$
$= 3\sqrt[5]{2}$

32. **B**
Sol. The point where the two axes intersect is called **origin**.

33. **B**
Sol. The degree of a constant polynomial is **0**.

34. **D**
Sol. $\frac{ab^2}{2} - \frac{a^2b}{4}$

$\frac{ab}{2}\left[b - \frac{a}{2}\right]$

35. **D**
Sol. $0.000064 = 6.4 \times 10^{-5}$

36. **C**
Sol. $x + 2y = 6$
$(2) + 2(2) = 6$
$6 = 6$
LHS = RHS

37. **D**
Sol. $6(x + 6)(x - 6)$ and $6 \times 6 (x + 6)$
HCF = $6(x + 6)$

38. **D**
Sol. Let the rational number = x
It's reciprocal = $\frac{1}{x}$
$\therefore x \times \frac{1}{x} = 1$

39. **D**
Sol. Let the salary ₹ x
**A.T.Q**
$x - \frac{20}{100}x = 8400$
$\therefore x = 10500$

40. **B**
Sol. Let the angles be 2x, 3x, 6x & 7x
A.T.Q
$2x + 3x + 6x + 7x = 360°$
$x = 20$
$\therefore$Smallest angle = $2 \times 20 \Rightarrow 40°$

41. **C**
Sol. $x^2 + \frac{1}{x^2} = 5 - 2$
again squaring on both sides
$x^4 + \frac{1}{x^4} = 9 - 2$
$\therefore x^4 + \frac{1}{x^4} = 7$

42. **A**
Sol. $\sqrt{\frac{(999)^2}{12321}} = \frac{999}{111} = 9$

43. **D**
Sol. $\sqrt[3]{(-12) \times (-12) \times (-12)} = -12$

44. **A**
Sol. Mode = 3 Median – 2 Mean
3(12) – 2(16)

Mode = 4

45. **B**

Sol. Let numbers be x, x + 1, x + 2, x + 3, x + 4 = 140

x = 26

$\therefore$greatest number = 26 + 4 $\Rightarrow$ 30

# PHYSICS

1. D
Sol. I = 15 + 3 – 4 = 14 A

2. C
Sol. Ampere is the unit of electric current.

3. B
Sol. Sound wave is a longitudinal wave.

4. B
Sol. $R_{eq} = \frac{\frac{R}{2} \times \frac{R}{2}}{\frac{R}{2} + \frac{R}{2}} = \frac{R^2}{4} \times \frac{2}{2R} = \frac{R}{4}$

5. C
Sol. $\frac{R}{R'} = \frac{\rho \frac{\ell}{A}}{\rho \frac{3\ell}{A/3}}$

$\Rightarrow \frac{R}{R'} = \frac{1}{9} \Rightarrow R' = 9R$

6. C
Sol. Process of purifying metals by passing electricity is called electrorefining.

7. A
Sol. Electroplating is a chemical effect of current.

8. C
Sol. Resistivity of a wire depends upon the nature of material of wire and temperature.

9. B
Sol. In series combination, same current flows in each resistor.

10. B
Sol. V = IR
V = (0.5) × 20 ⇒ 10 V

11. C
Sol. The point inside the earth at which a movement occurs and trigger an earthquake is called focus.

12. C
Sol. $R = \frac{V^2}{P}$

13. B
Sol. $R_{eq} = 7 + \frac{4 \times 12}{4 + 12} \Rightarrow 10\ \Omega$

14. A
Sol. Lightning is caused due to the accumulation of charges in clouds.

15. B

Sol. Energy = Power × Time

$\Rightarrow 30 \times (5 \times 60)$

$\Rightarrow 9$ KJ

## CHEMISTRY

1. C
Sol. Combustion is not possible without oxygen.

2. B
Sol. Strong heating in absence of air provides more energy per ounce than raw wood.

3. A
Sol. Silver is most ductile material among the following.

4. C
Sol. Graphite is used to make lubricants.

5. A
Sol. Water gas: $CO + H_2$

6. A
Sol. $CO_2$ is responsible for global warming.

7. B
Sol. Central zone of candle flame is luminous and has moderate temperature.

8. C
Sol. LPG is gaseous fuel.

9. D
Sol. Since water is heavier than oil, it sinks below the oil so oil keeps burning on top.

10. B
Sol. Caloric value is measured in unit of energy per unit mass of substance. [kJ/kg]

11. C
Sol. Baking soda can be used to extinguish fire.

12. A
Sol. Among the following kerosene obtained at lowest temperature during fractional distillation of petroleum.

13. B
Sol. Combustion of coke produces no flames.

14. A
Sol. Coke is purest form of carbon.

15. A
Sol. Biogas is produced due to anaerobic fermentation.

# BIOLOGY

1. B
Sol. RBC found in humans but devoid of nucleus in its mature state.

2. C
Sol. Living cells were discovered by Leeuwenhoek.

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

4. C
Sol. The covering of the cell that separates the content of the cell from its external environment is called cell membrane.

5. B
Sol. The nucleus has a double layered covering called nuclear membrane.

6. D
Sol. Cell wall is made up of cellulose.

7. C
Sol. Power house of the cell is mitochondria.

8. D
Sol. Hen's egg is an example of cell.

9. D
Sol. Golgi apparatus helps in transport and secretion.

10. A
Sol. Green colour of leaves is due to presence of the pigment chlorophyll.

11. D
Sol. Intercellular connections in plant cells are called plasmodesmata.

12. A
Sol. The infoldings in mitochondria are known as cristae.

13. A
Sol. Single celled organisms are called unicellular.

14. C
Sol. Cell membrane is common to plant cell, animal cell and a bacterial cell.

15. B
Sol. The thread-like structures present in the nucleus are chromosomes.