

# **FIITJEE INTERNAL TEST**

**Batch: NWCMLG425A1\_PT-1**

**PHASE TEST**

**QP CODE: 100703**

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.

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**Name of the Candidate** : .....

**Enrollment Number** : .....

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**SECTION – I**  
**MATHEMATICS**

1. Roman numeral for the greatest three-digit number is \_\_\_\_\_.  
(A) IXIXIX (B) CMXCIX  
(C) CMIXIX (D) CMIIC
2. The HCF of two co-prime numbers is \_\_\_\_\_.  
(A) 1 (B) 0  
(C) 2 (D) none
3. If  $5476a$  is divisible by 3, then what can be the least value of  $a$ ?  
(A) 1 (B) 2  
(C) 3 (D) 6
4. The integer which is 5 more than  $[-2 + (-4)]$  is \_\_\_\_\_.  
(A)  $-1$  (B)  $-2$   
(C) 1 (D) 2
5. Place value and face value are always equal at which place?  
(A) Hundreds (B) Ones  
(C) Thousands (D) Tens
6. What least value should be given to \* so that the number  $653^*47$  is divisible by 11?  
(A) 9 (B) 6  
(C) 7 (D) 1
7.  $(35 \times 22) \times 25 = 35 \times (22 \times 25)$  is an example of \_\_\_\_\_ property.  
(A) Commutative (B) Associative  
(C) Closure (D) Distributive
8. Sum of two integers is  $-35$ . If one of them is 15, then other number is \_\_\_\_\_.  
(A) 20 (B)  $-20$   
(C)  $-50$  (D) 50
9. By how much is three-fifth of 350 greater than four-seventh of 210?  
(A) 100 (B) 110  
(C) 90 (D) 95
10. The HCF of two numbers is 28 and their LCM is 336. If one number is 112, then the other number is \_\_\_\_\_.  
(A) 64 (B) 84  
(C) 34 (D) 92

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*Space For Rough Work*

11. If  $45 - [28 - \{36 - (13 + x)\}] = 60$ , then  $x$  is \_\_\_\_\_.
- (A) -19 (B) 19  
(C) 20 (D) -20
12. Simplify  $|10 - 4| \div |-3|$
- (A) -2 (B) -18  
(C) 2 (D) 3
13. The value of  $1 \div \frac{1}{1 \div \frac{1}{1 \div \frac{1}{1 \div 3}}}$
- (A) 3 (B) 1/3 (C) 1 (D) 2/3
14. The least number which when decreased by 9 is exactly divisible by 12, 16, 24 and 48 is \_\_\_\_\_.
- (A) 16 (B) 48  
(C) 57 (D) 39
15. Value of  $976 \times 237 + 976 \times 763$  is \_\_\_\_\_.
- (A) 968000 (B) 976000  
(C) 100000 (D) 900000
16. Which of the following integers is greatest?
- (A) -16 (B) -18  
(C) -20 (D) -83
17. The predecessor of  $|-1|$  is \_\_\_\_\_.
- (A) -2 (B) 2 (C) 0 (D) 1
18. What least number should be added to 1330 to get a number exactly divisible by 43?
- (A) 46 (B) 1  
(C) 3 (D) 7
19. Multiplicative inverse of  $\left(\frac{8}{4} \div \frac{5}{8} + \frac{1}{4}\right)$  is \_\_\_\_\_.
- (A)  $\frac{69}{20}$  (B)  $\frac{20}{69}$  (C)  $\frac{67}{12}$  (D)  $\frac{12}{67}$

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20. The sum of  $-23, 18, -26, -57$  is \_\_\_\_\_.  
(A)  $-40$  (B)  $-88$   
(C)  $-60$  (D)  $-20$
21. Which of the following is equal to 1 billion?  
(A) 10 lakh (B) 1 crore  
(C) 10 crore (D) 100 crore
22. Find the greatest number which will divide the greatest 3-digit number and the greatest 4-digit number exactly.  
(A) 9 (B) 8  
(C) 7 (D) 3
23. Sum of ages of A & B is 48. If A is 12 years old, then the age of B is \_\_\_\_\_.  
(A) 36 years (B) 35 years  
(C) 38 years (D) 39 years
24. Every positive integer is \_\_\_\_\_ than every negative integer.  
(A) greater (B) smaller  
(C) neither greater nor smaller (D) None of these
25. The round off of the number 346578 to its nearest lakh is \_\_\_\_\_.  
(A) 400000 (B) 300000  
(C) 340000 (D) 346000
26. Find the value of  $a + b + c$ , if  $373a$  is divisible by 9,  $473b$  is divisible by 11 and  $361c$  is divisible by 6.  
(A) 7 (B) 6  
(C) 0 (D) 4
27. The sum of first 10 natural numbers is \_\_\_\_\_.  
(A) 45 (B) 35  
(C) 56 (D) 55
28. If  $a$  and  $b$  are odd natural numbers, then which of the following is even?  
(A)  $a^2 + b^2 + 1$  (B)  $a \times b + 1$  (C)  $ab$  (D)  $ab + 2$
29. Simplify  $27 - [18 - \{16 - (5 - \overline{4 - 1})\}]$ .  
(A) 25 (B) 23  
(C) 18 (D) 5

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30. The reciprocal of the smallest prime number is \_\_\_\_\_.  
(A) 0 (B)  $\frac{1}{2}$  (C) 1 (D) 2
31. The value of  $\frac{(6+6+6+6)\div 6}{4+4+4+4\div 4}$  is \_\_\_\_\_.  
(A) 1 (B)  $\frac{3}{2}$  (C)  $\frac{4}{13}$  (D)  $3\frac{6}{13}$
32. If  $a$  &  $b$  are two integers such that  $a$  is the successor of  $b$ , then the value of  $a - b$  is \_\_\_\_\_.  
(A) 0 (B)  $-1$  (C) 1 (D) 2
33. The value of  $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right)\dots\left(1-\frac{1}{n}\right)$  is \_\_\_\_\_.  
(A)  $n$  (B) 1 (C)  $n^2$  (D)  $\frac{1}{n}$
34. If  $x$  and  $y$  are two co-prime numbers then their LCM is \_\_\_\_\_.  
(A)  $xy$  (B)  $x + y$  (C)  $\frac{x}{y}$  (D) 1
35.  $-11, -8, -5, -2, - \dots$ . The next number in the series is \_\_\_\_\_.  
(A)  $-1$  (B) 0 (C) 1 (D)  $-4$
36. The sum of the two numbers is 13 and product is 42, find sum of their reciprocals.  
(A)  $\frac{11}{42}$  (B)  $\frac{17}{42}$  (C)  $\frac{7}{42}$  (D)  $\frac{13}{42}$
37. Unit digit in  $((265)^{102} + (265)^{103})$  is \_\_\_\_\_.  
(A) 0 (B) 1 (C) 2 (D) 4
38. Every counting number has an infinite number of \_\_\_\_\_.  
(A) factors (B) multiples  
(C) prime factors (D) none of these
39. If  $P \div Q = P$ , then find the value of  $Q$ .  
(A)  $\frac{P}{2}$  (B)  $P$  (C) 1 (D) none of these

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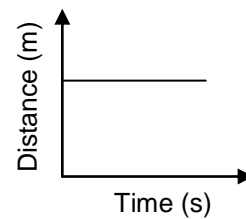
40. In which of the following pairs of integers, the first integer is not on the left of the other integer on the number line?  
(A)  $(-1, 10)$  (B)  $(-3, -5)$   
(C)  $(-5, -3)$  (D)  $(-6, 0)$
41. The difference of  $1\frac{3}{16}$  and its reciprocal is equal to \_\_\_\_\_.  
(A)  $1\frac{1}{8}$  (B)  $\frac{114}{123}$  (C)  $\frac{105}{116}$  (D)  $\frac{105}{304}$
42. Find the number when divided by 213, gives the quotient of 28 and a remainder of 160.  
(A) 6124 (B) 6100 (C) 6214 (D) 6412
43. The unit digit of  $1! \times 2! \times 3! \times 4! \times 5!$   
(A) 0 (B) 1 (C) 2 (D) 3
44. If  $x = (-1)^1 + (-1)^2 + \dots + (-1)^{2009}$  and  $y = (-1)^1 - (-1)^2 - (-1)^3 - (-1)^4 + \dots + (-1)^{2009}$ , then find  $x - y$ ?  
(A) 2006 (B) 2007 (C) 2008 (D) 2009
45. The unit digit in the product  $468 \times 107 \times 549 \times 731 \times 893$  is \_\_\_\_\_.  
(A) 1 (B) 2  
(C) 3 (D) 4

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**SECTION – II  
PHYSICS**

1. If there is no change in position of a body with respect to time and surroundings then it is said to be  
(A) in uniform motion (B) in non-uniform motion  
(C) at rest (D) in circular motion
2. If a body moves along a straight line then its motion is called  
(A) periodic motion (B) rectilinear motion  
(C) circular motion (D) oscillatory motion
3. In FPS system, the standard unit used to measure distance is  
(A) foot (B) centimetre  
(C) seconds (D) metre
4. Which of the following unit(s) was/were used to measure length in the olden days?  
(A) foot length (B) cubit  
(C) hand span (D) all of the above
5. Choose the periodic motion from the following:  
(A) A moving car (B) A freely falling body  
(C) Rotation of the earth (D) A flying kite
6. Measurement of a physical quantity consists of  
(A) number only (B) unit only  
(C) number and unit both (D) none
7. How many kilograms are there in 10 metric ton?  
(A) 100 kg (B) 10 kg  
(C) 10,000 kg (D) 1000 kg
8. Speed of an object is defined as  
(A) change in displacement with respect to time  
(B) total distance travelled in unit time  
(C) total distance covered  
(D) total time taken
9. What kind of motion does the distance-time graph of an object represent?  
(A) Uniform motion  
(B) Object is at rest  
(C) Non-uniform motion  
(D) Can't say



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10. Ravi starts from home and goes to park 11 km away. Then he returns back. What would be his displacement in the whole journey?  
(A) 0 km (B) 11 km  
(C) 22 km (D) can't say
11. A body moves 72 km with constant speed in 2 hours. Find its speed in m/s.  
(A) 36 m/s (B) 20 m/s  
(C) 15 m/s (D) 10 m/s
12. An object covers first 70 km of its journey with a speed of 35 km/h, next 50 km with a speed of 25 km/h and rest 40 km with a speed of 40 km/h. Find its average speed for whole journey.  
(A) 53.33 km/h (B) 33.33 km/h  
(C) 32 km/h (D) 20 km/h
13. A car travels with a speed of 60 km/h for the first half hour and with 80 km/h for the next two hour. What is the total distance covered by the car in these 2.5 hours?  
(A) 140 km (B) 110 km  
(C) 190 km (D) 220 km
14. Area under velocity-time graph gives:  
(A) distance (B) displacement  
(C) time (D) velocity
15. Change 45 m/s into km/h  
(A) 45 km/h (B) 90 km/h  
(C) 162 km/h (D) 81 km/h
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**SECTION – III**  
**CHEMISTRY**

1. The process of taking out seeds from cotton bolls  
(A) Shearing (B) Scouring  
(C) Ginning (D) Rolling
2. Which soil is suitable for a cotton plant?  
(A) Alluvial (B) Black  
(C) Red (D) Yellow
3. Jute fibre is obtained from  
(A) Root (B) Fruit  
(C) Bud (D) Stem
4. The gas that dissolves in water is  
(A) Hydrogen (B) Helium  
(C) Ozone (D) Oxygen
5. The materials through which objects can be seen clearly, are known as  
(A) translucent (B) smooth  
(C) opaque (D) transparent
6. Which among the following non-metals is hardest in nature?  
(A) Iodine (B) Sulphur  
(C) Diamond (D) Phosphorous
7. \_\_\_\_\_ of yarns is done in looms.  
(A) Spinning (B) Knitting  
(C) Weaving (D) Ginning
8. Which group of fibres contain only plant fibres?  
(A) Cotton, jute, silk (B) Cotton, jute, flax  
(C) Silk, nylon, wool (D) Wool, terylene, rayon
9. Which of the following is a natural fibre?  
(A) Nylon (B) Rayon  
(C) Silk (D) Polyester
10. Electric switches are made up of plastics and not of metals because  
(A) metals are good conductor of heat, where as plastics are not conductor of heat  
(B) metals are good conductor of electricity, where as plastics are not conductor of electricity  
(C) metals are expensive than the plastics  
(D) metals do not look beautiful

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11. The state of matter which has definite volume but no definite shape is  
(A) solid (B) liquid  
(C) gas (D) all of these
12. Ice floats on water because  
(A) the constituent particles of both ice and water are molecules  
(B) the density of water is lesser than the density of ice  
(C) the density of ice is lesser than the density of water  
(D) none of these
13. Which type of soil is best for the cultivation of jute plants?  
(A) Red soil (B) Alluvial soil  
(C) Black soil (D) None of these
14. Gunny bags are made from  
(A) jute yarn (B) cotton  
(C) wool (D) rayon
15. The name of device(s) used for making yarn from fibres is(are)  
(A) takli (B) charkha  
(C) loom (D) both (A) and (B)

### SECTION – IV BIOLOGY

1. Peppermint, turmeric, chilly powder, etc. are examples of \_\_\_\_\_.  
(A) Vegetables (B) Spices  
(C) Animal products (D) Milch animals
2. Our hairs and nails are made up of \_\_\_\_\_.  
(A) Calcium (B) Phosphorus  
(C) Potassium (D) Proteins
3. Which of the following is an oil yielding plant?  
(A) Pea (B) Cauliflower  
(C) Sunflower (D) Rose
4. What is PEM?  
(A) Protein Equal Malnutrition (B) Primary Energy Malnutrition  
(C) Protein Energy Malnutrition (D) Primary Equated Malnutrition
5. Which of the following stems are edible?  
(A) ginger, onion, potato (B) carrot, radish, pumpkin  
(C) carrot, ginger, onion (D) onion, potato, garlic

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*Space For Rough Work*

6. When we add two drops of solution of copper sulphate and ten drops of solution of caustic soda in the test tube filled with milk, the contents of the test tube turn violet. The violet colour indicates:  
 (A) Presence of carbohydrates in milk (B) Presence of fats in the milk  
 (C) Presence of protein in the milk (D) Presence of sugar
7. Salt is example of:-  
 (A) Mineral (B) Fat (C) Spice (D) Proteins
8. When we take a diet with all nutrients in proper proportion, it is called \_\_\_\_\_.  
 (A) complete diet (B) balanced diet  
 (C) junk diet (D) protein diet
9. Rickets is caused by the deficiency of:  
 (A) Vitamin A (B) Vitamin B<sub>1</sub> (C) Vitamin C (D) Vitamin D
10. Tooth decay is caused due to deficiency of \_\_\_\_\_.  
 (A) iron (B) sodium (C) calcium (D) iodine
11. Ram fainted in school while playing football. Which of the following foods should be given to him as a source of instant energy?  
 (A) Salt (B) Glucose (C) Ghee (D) Pulses
12. Heart disease, high blood pressure and diabetes are some of the harmful effects of \_\_\_\_\_.  
 (A) Malnutrition (B) Obesity  
 (C) Deficiency of proteins (D) Dehydration

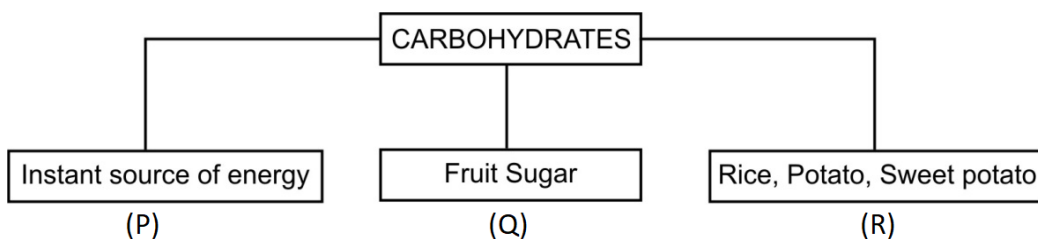
13. Match the column:

Column A		Column B	
(P)	Iron	(i)	Dental caries
(Q)	Iodine	(ii)	Muscular weakness
(R)	Protein	(iii)	Anemia
(S)	Fluorine	(iv)	Obesity
		(v)	Kwashiorkor
		(vi)	Goitre

- (A) P-v, Q-i, R-iii, S-vi (B) P-iv, Q-i, R-v, S-ii  
 (C) P-iii, Q-vi, R-v, S-i (D) P-iii, Q-vi, R-i, S-ii

14. The sample of food on application of iodine solution turns blue black in colour. The sample of food consists of \_\_\_\_\_.  
 (A) Protein (B) Carbohydrate (C) Fat (D) Mineral

15.



Choose the correct match regarding P, Q and R:

- (A) Q – Glucose P – Fructose R – Starch  
 (B) P – Starch Q – Glucose R – Fructose  
 (C) P – Glucose Q – Fructose R – Starch  
 (D) R – Glucose P – Glucose Q – Glucose

Space For Rough Work

# FIITJEE INTERNAL TEST

Batch: NWCMLG425A1\_PT-1

PHASE TEST

QP CODE: 100703

## Scholastic Aptitude Test

### Answers

#### SECTION – I MATHEMATICS

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

#### SECTION – II PHYSICS

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

#### SECTION – III CHEMISTRY

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

#### SECTION – IV BIOLOGY

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

# Answers & Solutions

## SECTION – I

### MATHEMATICS

1. **B**  
Sol. Roman numeral for the greatest three-digit number is **CMXCIX**.
2. **A**  
Sol. HCF = 1
3. **B**  
Sol. Sum of digits =  $5 + 4 + 7 + 6 + a$   
 $= 22 + a$   
 $\therefore a = 24 - 22$   
 $a = 2$
4. **A**  
Sol.  $[-2 + (-4)] + 5$   
 $= -6 + 5$   
 $= -1$
5. **B**  
Sol. Place value and face value are always equal at **ones place**.
6. **D**  
Sol.  $653\boxed{\phantom{0}}47$   
Sum of digits at odd places =  $5 + \boxed{\phantom{0}} + 7$   
 $= 12 + \boxed{\phantom{0}}$   
Sum of digits at even places =  $6 + 3 + 4$   
 $= 13$   
Difference =  $12 + \boxed{\phantom{0}} - 13$   
 $= \boxed{\phantom{0}} - 1$   
 $\therefore \boxed{\phantom{0}} = 1$
7. **B**  
Sol.  $(35 \times 22) \times 25 = 35 \times (22 \times 25)$  is an example of **Associative** property.
8. **C**  
Sol. Other integer =  $-35 - 15$   
 $= -50$
9. **C**  
Sol.  $\frac{3}{5} \times 350 = 210$   
 $\frac{4}{7} \times 210 = 120$   
 $210 - 120 = 90$
10. **B**  
Sol. Other number =  $\frac{28 \times 336}{112} = 84$

11. **D**

$$\text{Sol. } 45 - [28 - \{36 - (13 + x)\}] = 60$$

$$45 - [28 - \{36 - 13 - x\}] = 60$$

$$45 - [28 - 23 + x] = 60$$

$$45 - 5 - x = 60$$

$$40 - x = 60$$

$$-x = 20$$

$$x = -20$$

12. **C**

$$\text{Sol. } \frac{6}{3} = 2$$

13. **B**

$$\text{Sol. } 1 \div \frac{1}{1 \div \frac{1}{1/3}} = 1 \div \frac{1}{1/3}$$

$$= 1/3$$

14. **C**

$$\text{Sol. } \text{L.C.M of } 12, 16, 24, 48 = 48$$

$$\therefore \text{Required number} = 48 + 9$$

$$= 57$$

15. **B**

$$\text{Sol. } 976 (237 + 763)$$

$$976 \times 1000 = 976000$$

16. **A**

$$\text{Sol. } -16 \text{ is greater}$$

17. **C**

$$\text{Sol. } |-1| = 1$$

Then predecessor of 1 is **0**.

18. **C**

$$\text{Sol. } \text{Here } 43 - 40 = 3$$

19. **B**

$$\text{Sol. } \frac{8}{4} \times \frac{8}{5} + \frac{1}{4} = \frac{16}{5} + \frac{1}{4} = \frac{69}{20}$$

$$\text{Then, multiplicative inverse} = \frac{20}{69}.$$

20. **B**

$$\text{Sol. } -23 + 18 - 26 - 57$$

$$= -88$$

21. **D**

Sol. 1 billion = 1000000000 and 100 crore = 1000000000.  
 $\therefore$  1 billion = 100 crore

22. **A**

Sol. H.C.F of 999 and 9999 is 9

23. **A**

Sol. Let age of B is x  
 $12 + x = 48$   
 $x = 48 - 12 = 36$

24. **A**

Sol. Every positive integer is greater than every negative integer.

25. **B**

Sol. Since  $346578 < 350000$   
 $\therefore$  Rounded off value of 346578 is 300000

26. **A**

Sol. $373a = 3 + 7 + 3 + a$ $13 + a$ $a = 5$	$473b$ Sum of digits at odd places = $7 + b$ Sum of digits at even places = $4 + 3 = 7$ Difference = $7 + b - 7$ $= b$ $b = 0$	$361c$ $c = 2$
$a + b + c$ $5 + 0 + 2 = 7$		

27. **D**

Sol.  $\frac{n(n+1)}{2} = \frac{10(11)}{2} = 55$

28. **B**

Sol.  $a \times b + 1$

29. **B**

Sol.  $27 - \left[ 18 - \left\{ 16 - (5 - \overline{4 - 1}) \right\} \right]$   
 $= 27 - \left[ 18 - \left\{ 16 - (5 - 3) \right\} \right]$   
 $= 27 - \left[ 18 - \left\{ 16 - 2 \right\} \right]$   
 $= 27 - [18 - 14]$   
 $= 27 - 4$   
 $= 23$

30. **B**

Sol. Smallest prime number = 2  
 Reciprocal of 2 =  $\frac{1}{2}$

31. **C**

Sol.  $\frac{(6+6+6+6) \div 6}{4+4+4+4 \div 4} = \frac{24 \div 6}{4+4+4+1}$   
 $= \frac{4}{13}$

32. **C**

Sol. a is successor of b  
 $\therefore a = b + 1$   
 $a - b = b + 1 - b = 1$

33. **D**

Sol.  $\left(\frac{2-1}{2}\right)\left(\frac{3-1}{3}\right)\left(\frac{4-1}{4}\right)\left(\frac{5-1}{5}\right)\dots\left(\frac{n-1}{n}\right)$   
 $\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \dots \frac{n-1}{n} = \frac{1}{n}$

34. **A**

Sol. LCM of 2 co-prime numbers is their product  
 $\therefore$  LCM of x and y is  $x \times y = xy$

35. **C**

Sol. Difference =  $-8 - (-11)$   
 $= 3$   
 $\therefore -2 + 3 = 1$

36. **D**

Sol. Let the numbers be a, b  
Sum  $a + b = 13$   
Product  $ab = 42$   
 $\Rightarrow \frac{a+b}{ab} = \frac{13}{42}$   
 $\frac{1}{a} + \frac{1}{b} = \frac{13}{42}$

37. **A**

Sol. Since unit digit of  $5^n = 5$   
 $\therefore$  unit digit of  $(265)^{102} = 5$  and unit digit of  $(265)^{103} = 5$   
 $\therefore$  unit digit of  $(265)^{102} + (265)^{103} =$  unit digit of  $5 + 5$   
 $=$  unit digit of 10  
 $= 0$

38. **B**

Sol. Multiples of any numbers are unlimited  
For example, multiples of 2 are 2, 4, 6, 8, 10, 12,.... so on

39. **C**

Sol.  $P \times \frac{1}{Q} = P$   
 $Q = \frac{P}{P} = 1$



40. **B**Sol.  $(-3, -5)$  is not on the left of the other integer on the number line.41. **D**

$$\begin{aligned} \text{Sol. Required difference} &= \frac{19}{16} - \frac{16}{19} \\ &= \frac{(19+16)(19-16)}{304} \\ &= \frac{35 \times 3}{304} = \frac{105}{304} \end{aligned}$$

42. **C**

$$\begin{aligned} \text{Sol. Dividend} &= \text{divisor} \times \text{quotient} + \text{remainder} \\ &= 28 \times 213 + 160 \\ &= 6124 \\ \therefore 6124 &\text{ is the required number} \end{aligned}$$

43. **A**

$$\begin{aligned} \text{Sol. } &1 \times 2 \times 1 \times 3 \times 2 \times 4 \times 3 \times 2 \times 1 \times 5 \times 4 \times 3 \times 2 \times 1 \\ &= 12 \times 24 \times 120 \\ &= 0 \end{aligned}$$

44. **C**

$$\begin{aligned} \text{Sol. } &x = -1 + 1 + \dots + (-1) \text{ and } y = -1 - 1 - 1 \dots - 2009 \text{ times} \\ &x = -1 \qquad \qquad \qquad y = -2009 \\ \therefore &x - y \\ &-1 - (-2009) = 2008 \end{aligned}$$

45. **B**

$$\begin{aligned} \text{Sol. Unit digit of product} &= \text{unit digit of } 8 \times 7 \times 9 \times 1 \times 3 \\ &= \text{unit digit of } 1512 \\ &= 2 \end{aligned}$$

## SECTION – II PHYSICS

1. C  
Sol. If there is no change in position of a body with respect to time and surroundings then it is said to be at rest.
2. B  
Sol. Motion of a body along a straight line is called “rectilinear motion”.
3. A  
Sol. In FPS system, the standard unit used to measure distance is ‘Foot’
4. D  
Sol. In olden days peoples used foot length, cubit, hand span etc. to measure length.
5. C  
Sol. Rotation of the earth is periodic as it repeats after a fixed time interval.
6. C  
Sol. Measurement of a physical quantity consists of two parts:  
(a) number (b) unit of measurement
7. C  
Sol.  $\because$  1 metric ton = 10 quintals  
1 quintal = 100 kg  
So, 1 metric ton =  $10 \times 100$  kg  
1 metric ton = 1000 kg  
10 metric ton = 10,000 kg
8. B  
Sol. As we know  
Speed =  $\frac{\text{Distance travelled}}{\text{Time taken}}$   
If time taken = 1 sec (unit time)  
Then speed =  $\frac{\text{Distance travelled}}{1\text{s}}$   
Speed = Distance travelled  
We can say that speed is total distance travelled in unit time.
9. B  
Sol. As we can see from the graph, distance is not changing with time. This indicates object will be at rest.
10. A  
Sol. Displacement is the shortest distance between initial and final position of an object.  
In the given journey of Ravi, both initial and final positions of Ravi is home. So, displacement will be 0 km.
11. D  
Sol. Distance covered = 72 km =  $72 \times 1000$  m = 72000 m  
Time taken = 2 h =  $2 \times 3600$  s = 7200 s  
Speed = distance / time =  $72000 / 7200 = 10$  m/s

12. C

Sol. Total distance covered =  $70 + 50 + 40 = 160$  km  
Total time taken =  $(70/35) + (50/25) + (40/40) = 2 + 2 + 1 = 5$  h  
So, average speed =  $160/5 = 32$  km/h.

13. C

Sol. Total distance covered =  $60 \times 0.5 + 80 \times 2 = 30 + 160 = 190$  km.

14. B

Sol. Area under velocity-time graph gives displacement.

15. C

Sol.  $45 \text{ m/s} = 45 \times \frac{18}{5} \text{ km/h}$   
 $= 9 \times 18 = 162 \text{ km/h}$

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**SECTION – III  
CHEMISTRY**

1. C  
Sol. The process of taking out seeds from cotton bolls is called ginning.
2. B  
Sol. Black soil is suitable for a cotton plant.
3. D  
Sol. Jute fibre is obtained from stem.
4. D  
Sol. Oxygen dissolves in water.
5. D  
Sol. The materials through which objects can be seen clearly, are known as transparent.
6. C  
Sol. Diamond is hardest in nature.
7. C  
Sol. Weaving of yarns is done in looms.
8. B  
Sol. Cotton, Jute, Flax contain only plant fibres
9. C  
Sol. Silk is a natural fibre
10. B  
Sol. Electric switches are made up of plastics and not of metals because metals are good conductor of electricity, where as plastics are not conductor of electricity.
11. B  
Sol. The state of matter which has definite volume but no definite shape is liquid.
12. C  
Sol. Ice floats on water because the density of ice is lesser than the density of water.
13. B  
Sol. Alluvial soil is best for the cultivation of jute plants.
14. A  
Sol. Gunny bags are made from jute yarn.
15. D  
Sol. The name of device(s) used for making yarn from fibres are takli & charkha.

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**SECTION – IV**  
**BIOLOGY**

1. **B**  
Sol. Peppermint, turmeric, chilly powder, etc. are examples of **Spices**.
2. **D**  
Sol. **Keratinocytes** make **keratin**, a type of **protein** that's a basic component of hair, skin, and nails. Keratin in the skin's outer layer helps create a protective barrier.
3. **C**  
Sol. **Sunflower** is an oil-yielding plant. Sunflower oil is the non-volatile oil extracted from sunflower seeds.
4. **C**  
Sol. **Protein-Energy Malnutrition** or PEM is the condition of lack of energy due to the deficiency of all the macronutrients and many micronutrients.
5. **A**  
Sol. **Ginger, onion** and **potato** stems are edible.
6. **C**  
Sol. The violet colour indicates **presence of protein in the milk**.
7. **A**  
Sol. Salt is example of **mineral**.
8. **B**  
Sol. A balanced diet contains an adequate amount of all the nutrients required by the body to grow, remain healthy and be disease-free. In addition, a healthy, balanced diet provides the necessary energy requirement, protects against vitamin, mineral, and other nutritional deficiencies, and builds up immunity.
9. **D**  
Sol. Rickets usually occurs because of a lack of **vitamin D** or calcium.
10. **C**  
Sol. Tooth decay is caused due to deficiency of **calcium**.
11. **B**  
Sol. **Glucose** should be given to Ram as a source of instant energy.
12. **B**  
Sol. Heart disease, high blood pressure and diabetes are some of the harmful effects of **obesity**.
13. **C**  
Sol. Iron – Anemia  
Iodine – Goitre  
Protein – Kwashiorkor  
Fluorine – Dental caries
14. **B**  
Sol. The light orange-brown colour Iodine solution turns blue-black in colour when it reacts with starch. This indicates the presence of carbohydrates in the food item to which iodine solution was added. Food items like bread, chapatti, etc. are rich in **carbohydrates**
15. **C**  
Sol. P – Glucose Q – Fructose R – Starch