



Madhya Pradesh

# Questions & Solutions

for

**NTSE (Stage-I) 2020-21**

## **INSTRUCTIONS TO CANDIDATES**

Read the following instructions carefully before you answer the questions.

1. Total number of questions are 200 (100 Q. MAT & 100 Q. SAT) for this paper. All questions carry one mark each.
2. All questions are compulsory.
3. For each question there are four options given in question paper. Check for the correct answer and bubble correct option from four circles given in answer sheet by Black/Blue pen. Please do not write any answers on question papers.
4. Start answering from first question one after the other till last question.
5. If you do not know the answer of any question, do not spend much time on it and pass on to the next one. Time permitting you can come back to the questions which you have left in the first instance and try them again.
6. Utilize the allotted time for solving the questions in best possible way. The rough work is to be done in the box given under each page.

## MAT:- PART-I : MENTAL ABILITY TEST

**Direction :** In question nos. 1 to 12 there is a missing number shown by question mark (?). This term is one of the four alternatives given below the questions. Choose the correct alternative.

1. 5, 6, 10, 19, 35, ?

- (A) 55                      (B) 60  
(C) 51                      (D) 71

**Answer (B)**

**Sol.** 5, 6, 10, 19, 35,

$$\begin{array}{cccccc} 5 & 6 & 10 & 19 & 35 & X \\ \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} \\ 1 & 4 & 9 & 16 & 25 & \\ 1^2 & 2^2 & 3^2 & 4^2 & 5^2 & \end{array}$$

$$\Rightarrow 35 + 25 = 60$$

2. 6, 13, 29, 63, ?

- (A) 126                      (B) 113  
(C) 128                      (D) 133

**Answer (D)**

**Sol.** 
$$\begin{array}{cccccc} 6 & 13 & 29 & 63 & X \\ \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} \\ \times 2 + 1 & \times 2 + 3 & \times 2 + 5 & \times 2 + 7 & \end{array}$$

$$\Rightarrow 63 \times 2 + 7$$

$$126 + 7$$

$$\Rightarrow 133$$

3. 4, 8, 16, 32, 64, 128, ?

- (A) 256                      (B) 228  
(C) 512                      (D) 192

**Answer (A)**

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Sol.  $4 \xrightarrow{\times 2} 8 \xrightarrow{\times 2} 16 \xrightarrow{\times 2} 32 \xrightarrow{\times 2} 64 \xrightarrow{\times 2} 128 \xrightarrow{\times 2} 256$

4. 3, 5, 9, 17, 33, 65, ?

- (A) 130 (B) 98  
(C) 129 (D) 132

Answer (C)

Sol.  $3 \xrightarrow{2^1} 5 \xrightarrow{2^2} 9 \xrightarrow{2^3} 17 \xrightarrow{2^4} 33 \xrightarrow{2^5} 65$

$\Rightarrow 65 + 64 = 129$

5. 3, 6, 11, 18, 27, ?

- (A) 48 (B) 38  
(C) 36 (D) 56

Answer (B)

Sol.  $3 \xrightarrow{3} 6 \xrightarrow{5} 11 \xrightarrow{7} 18 \xrightarrow{9} 27 \xrightarrow{11} X$

$\Rightarrow 27 + 11 = 38$

6. 2, 4, 12, 48, 240, ?

- (A) 1440 (B) 1200  
(C) 480 (D) 960

Answer (A)

Sol.  $2 \xrightarrow{\times 2} 4 \xrightarrow{\times 3} 12 \xrightarrow{\times 4} 48 \xrightarrow{\times 5} 240 \xrightarrow{\times 6} 1440$

7. 15, 18, 111, 114, 117, ?

- (A) 125 (B) 123  
(C) 121 (D) 120

Answer (D)

Sol. 15, 18, 111, 114, 117

$15 \xrightarrow{+96} 111 \xrightarrow{+6} 117$   
 $18 \xrightarrow{+96} 114$   
 $X = 114 + 6 = 120$

8. 33, 44, 35, ?, 37, 46, 39, 47, .....

- (A) 36 (B) 47 (C) 45 (D) 48

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An  
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IIT-JEE (Adv.) AIR-3

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**Answer (C)**

**Sol.** 33, 44, 35, ?, 37, 46, 39, 47

$$\begin{array}{ccccccc}
 & & +1 & & +1 & & +1 \\
 & \swarrow & & \swarrow & & \swarrow & \\
 33 & & 44 & & 35 & & 37 & & 46 & & 39 & & 47 \\
 & \searrow & & \searrow & & \searrow & & \searrow & & \searrow & & \\
 & +2 & & +2 & & +2 & & & & & & & 
 \end{array}$$

= 44 + 1 = 45

9. 41, 42, 50, 77, 141, ?

- (A) 248                      (B) 266  
(C) 423                      (D) 218

**Answer (B)**

**Sol.**

$$\begin{array}{cccccc}
 41 & 42 & 50 & 77 & 141 & 266 \\
 \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \\
 1 & 8 & 27 & 64 & 125 & \\
 1^3 & 2^3 & 3^3 & 4^3 & 5^3 & 
 \end{array}$$

10. 4, 6, 10, 16, 24, ?

- (A) 30                      (B) 40  
(C) 36                      (D) 34

**Answer (D)**

**Sol.**

$$\begin{array}{cccccc}
 4 & 6 & 10 & 16 & 24 & X \\
 \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \\
 2 & 4 & 6 & 8 & 10 & \\
 \searrow & \searrow & \searrow & \searrow & \searrow & \\
 & +2 & & +2 & & +2 & 
 \end{array}$$

= 24 + 10 = 34

11. B, D, G, I, ?, N.....

- (A) L                      (B) M  
(C) K                      (D) J

**Answer (A)**

**Sol.**

$$\begin{array}{cccccc}
 B & D & G & I & L & N \\
 \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
 2 & 4 & 7 & 9 & 12 & 14 \\
 \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \\
 & +2 & & +3 & & +2 & & +3 & & +4 & 
 \end{array}$$

12. A, CD, GHI, ?, UVWXY

- (A) NOPQ                      (B) MNO  
(C) MNOP                      (D) NOPQ

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### Answer (C)

**Direction:** In questions nos. 13 to 22 there is a certain relationship between two given words on left side of :: symbol and one word is given on right hand side of :: and a question mark. Choose the correct alternative from options which shows the same relationship between these pairs of words as between the pair of words given on left hand side of :: symbol.

13. Film : Producer :: Book : ?

- (A) Director                      (B) Publisher                      (C) Editor                      (D) Writer

### Answer (B)

**Sol.** A      CD    GHI    MNOP    UXWXY  
1      3 4    789    13 14 15 16    21 22 23 24 25  
+2      +3    +4                      +5

14. Clock : Time :: Thermometer : ?

- (A) Heat                      (B) Radiation  
(C) Energy                      (D) Temperature

### Answer (D)

**Sol.** Measures Temperature

15. Ink : Pen :: Blood : ?

- (A) Vein                      (B) Donation  
(C) Accident                      (D) Doctor

### Answer (A)

**Sol.** Blood is contained in veins.

16. Ship : Captain :: Aeroplane : ?

- (A) Air-hostess                      (B) Runway  
(C) Pilot                      (D) Airport

### Answer (C)

**Sol.** Controller

17. Bat : Ball :: Badminton : ?

- (A) Ball                      (B) Table  
(C) Court                      (D) Shuttle-cock

### Answer (D)

18. Mass : Kilogram :: Length : ?

- (A) Volt                      (B) Kelvin  
(C) Meter                      (D) Ampere

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**Answer (B)**

**Sol.** Brick is made up of clay.

24. Accident is related to carefulness in the same way as Disease is related to\_\_\_\_\_
- (A) Treatment
  - (B) Medicine
  - (C) Absence of Sanitation
  - (D) Doctor

**Answer (C)**

**Sol.** Carefulness is an ability similarly absence of sanitation is also an ability.

25. Choose the odd one out from following.
- (A) Sun
  - (B) Mars
  - (C) Earth
  - (D) Star

**Answer (D)**

**Sol.** Star is a general word used for heavy bodies whereas rest belongs to solar system.

26. Choose the odd one out from following.
- (A) Tomato
  - (B) Mango
  - (C) Banana
  - (D) Apple

**Answer (A)**

**Sol.** Tomato is a vegetable whereas rest are fruits.

27. Choose the odd one out from following.
- (A) Teacher
  - (B) Office
  - (C) Student
  - (D) Class

**Answer (B)**

28. Find the odd term.

- (A) 27
- (B) 25
- (C) 16
- (D) 9

**Answer (A)**

**Sol.** 27 is a perfect whereas rest are perfect squares.

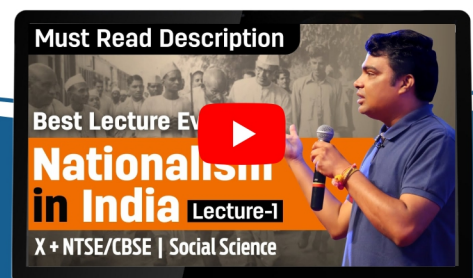
29. Find the odd one out.

- (A) Solid
- (B) Liquid
- (C) Gas
- (D) Water

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**Answer (D)**

**Sol.** Water is not a state of matter.

30. Choose the odd one out.

- (A) Ear                      (B) Eye  
(C) Nose                    (D) Throat

**Answer (D)**

**Sol.** Throat is not a sensory organ.

31. In a certain language, POPULAR is coded as ONOTKZQ which word would be coded as GBNPVT?

- (A) FAMOSU                (B) FAMOUS  
(C) FASOUM               (D) FOSAUM

**Answer (B)**

32. In a certain code SIKKIM is written as THLJLL, how is TRAINING written in that code?

- (A) SQBHOHOH          (B) UQBJOHHO  
(C) UQBHOHOF          (D) UQBJOHOH

**Answer (B)**

32. In a certain code SIKKIM is written as THLJLL, how is TRAINING written in that code?

- (A) SQBHOHOH          (B) UQBJOHHO  
(C) UQBHOHOF          (D) UQBJOHOH

**Answer (C)**

33. If  $Z = 52$ , and  $ACT = 48$ , then  $TAB$  will be equal to

- (A) 46                      (B) 44  
(C) 41                      (D) 39

**Answer (A)**

**Sol.**  $Z = 56, ALT = 48 \rightarrow TAB$

$$\Rightarrow 2 = 2 \times 26, 4 = 2 \times 25,$$

$$X = 2 \times 24, \dots \dots A = 2 \times 1$$

$$\therefore TAB \Rightarrow 2 \times 20 + 2 \times 1 + 2 \times 2$$

$$\Rightarrow 40 + 2 + 4 \Rightarrow 46$$

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34. In a certain language CHAMPION is coded as HCMAIPNO, how is POSITIVE coded in that language?

- (A) OPISITEV            (B) POISITEV  
(C) OPSIITEV           (D) OPISTIVE

**Answer (A)**

**Sol.** CHAMPION → HCMAIPNO

**Make pairs and reverse the letters within pairs**

∴ POSITIVE → OPISITEV

35. If air is called 'blue', 'blue' is called 'sky', 'sky' is called 'yellow', 'yellow' is called 'water' and 'water' is called 'pink', then what is the colour of 'clear sky'?

- (A) Blue                    (B) Yellow  
(C) Pink                    (D) Sky

**Answer (B)**

36. Introducing a person to her husband, a woman said "his brother's father is the only son of my grandfather". How is the woman related to this person ?

- (A) Mother                (B) Sister  
(C) Daughter             (D) Aunt

**Answer (B)**

**Direction:** (Question 37 and 38)

- (i)  $A + B$  means A is the son of B;  
(ii)  $A - B$  means A is the wife of B;  
(iii)  $A \times B$  means A is the brother of B;  
(iv)  $A \div B$  means A is the mother of B;  
(v)  $A = B$  means A is the sister of B.

37. What does  $P + R - Q$  means?

- (A) Q is the son of P    (B) Q is the brother of P  
(C) Q is the father of P (D) Q is the uncle of P

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**Answer (C)**

**Sol.**  $\therefore P+R-Q \rightarrow R \text{ is wife of } Q$   
 $\left. \begin{array}{l} P \text{ is son of } R \end{array} \right\} \Rightarrow Q \text{ is father of } R$

38. What does  $P = R + Q$  means?

- (A) P is the daughter of Q
- (B) P is the aunt of Q
- (C) P is the niece of Q
- (D) P is the sister of Q

**Answer (A)**

**Sol.**  $\therefore P=R+Q \rightarrow R \text{ is son of } Q$   
 $\left. \begin{array}{l} P \text{ is sisiter of } R \end{array} \right\} \Rightarrow P \text{ is daughter of } Q$

39. Six students A, B, C, D, E and F are sitting in the field. A and B are from Gwalior, while the rest from Bhopal. D and F are tall while others are short. A, C and D are girls while others are boys. Which is the tall girl from Bhopal?

- (A) C
- (B) D
- (C) E
- (D) F

**Answer (B)**

**Sol.**  $\left. \begin{array}{l} A \& B \rightarrow \text{Gwalior} \\ C, D, E, F \rightarrow \text{Bhopal} \end{array} \right\} \text{Data interpretation}$   
 $\left. \begin{array}{l} A \& C \rightarrow \text{Girls} \\ B \& E \rightarrow \text{Boys} \end{array} \right\} \Rightarrow D \text{ is tall girl from Bhopal}$

40. Nitin ranks fifteen in a class of 39. What is his rank from the last?

- (A) 23
- (B) 24
- (C) 25
- (D) 26

**Answer (C)**

**Sol.** Rank from the last =  $39 - 15 + 1$   
 $= 24 + 1 = 25$

**Direction :** Study the following number sequence and answer the Question Nos. from 41 to 43.

**5, 3, 1, 2, 2, 8, 7, 2, 4, 4, 6, 1, 3, 4, 3, 2, 2, 4, 7, 8, 6, 1, 5, 9**

41. How many pairs of successive numbers having difference of 2 ?

- (A) Five
- (B) Six
- (C) Seven
- (D) Eight

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**Answer (B)**

**Sol.** (5, 3) (2, 4) (1, 3) (2, 4) (8, 6) Series

42. Figures which have frequency equal to 2 are from following-

- (A) 1, 2, 3                      (B) 2, 4, 7                      (C) 4, 5, 6                      (D) 5, 6, 8

**Answer (D)**

**Sol.** Series

43. How many numbers are in sequence which are written twice successively?

- (A) Three                      (B) Four  
(C) Five                      (D) Six

**Answer (A)**

**Sol.** (2, 2) (4, 4) (2, 2)

44. In the numbers from 100 to 1000, how many times digit 1 comes at the ten's place ?

- (A) 9                      (B) 10                      (C) 90                      (D) 900

**Answer (C)**

**Sol.** 110, 111, 112, 113, 114, 115, 116, 117, 118, 119 → 10  
....910, 911, 912, 913, 914, 915.....919 =  $10 \times 9 = 90$

45. If the numbers from 5 to 75, which are exactly divisible by 5 are arranged in descending order, which number would come at the 12<sup>th</sup> place from the bottom ?

- (A) 45                      (B) 50                      (C) 55                      (D) 60

**Answer (D)**

**Sol.** 5, 10, 15 | 20, 25, 30 | 35, 40, 45 | 50, 55, 60 | 65, 70, 75 |

Total=15

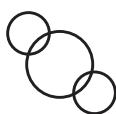
12<sup>th</sup> from bottom = 60 Ranking

**Direction:** For question Nos. 46 to 50. Each of the questions from 46 to 50 contains three elements. These elements may or may not have inter linkage. Each group of the elements fit into one of the diagrams given in (P), (Q), (R) and (S).

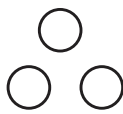
You have to indicate the group of elements which correctly fits into diagram.



(P)



(Q)



(R)



(S)

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46. Fruit, Apple, Mango

- (A) P (B) Q  
(C) R (D) S

**Answer (D)**

**Sol.** Venn diagram

47. Carrot, Food, Vegetables

- (A) P (B) Q (C) R (D) S

**Answer (A)**

**Sol.** Venn diagram

48. Traveller, Train, Bus

- (A) P (B) Q  
(C) R (D) S

**Answer (C)**

**Sol.** Venn diagram

49. Author, Lawyer, Singer

- (A) P (B) Q  
(C) R (D) S

**Answer (C)**

**Sol.** Venn diagram

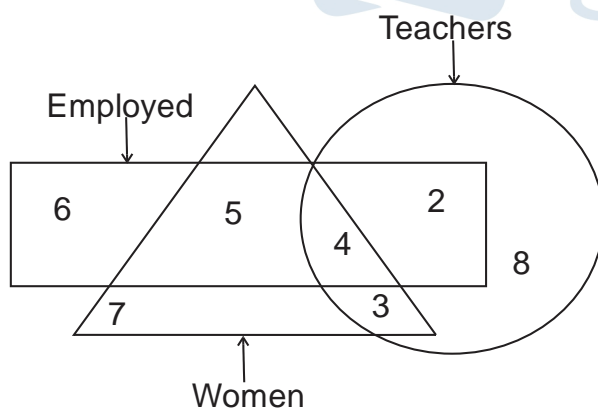
50. Truck, Ship, Goods

- (A) P (B) Q  
(C) R (D) S

**Answer (B)**

**Sol.** Venn diagram

**Direction:** Study the following figure and choose the correct option for questions from 51 to 53.



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51. Number of women teacher who are employed?

- (A) 6 (B) 5  
(C) 4 (D) 3

**Answer (C)**

52. Number of teachers, who are not employed?

- (A) 8 (B) 7  
(C) 6 (D) 5

**Answer (\*)**

**Sol.** Correct answer 11

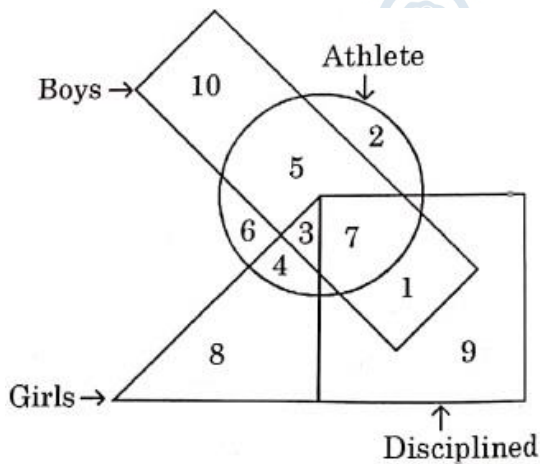
53. Number of women who are not teachers?

- (A) 7 (B) 9  
(C) 10 (D) 12

**Answer (D)**

**Sol.**  $5 + 7 = 12$

**Direction:** Study the following diagram and choose the correct option for questions from **54** to **55**.



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54. Number of boys who are athlete and are disciplined?

- (A) 1 (B) 7  
(C) 3 (D) 5

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**Answer (B)**

55. Number of girls who are not athlete?

- (A) 6                      (B) 7  
(C) 8                      (D) 9

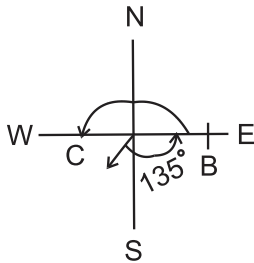
**Answer (C)**

56. A man is facing South-West and then he turns  $135^\circ$  in the anticlock-wise direction and then again he turns  $180^\circ$  clockwise. In which direction he is facing now?

- (A) West                      (B) East  
(C) South                      (D) North

**Answer (A)**

Sol.

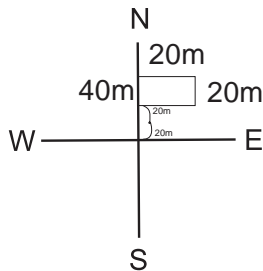


57. A girl goes 40 meters North then turns right and walks 20 meters, then again she turns right and walks 20 meters and gain she turns right and walks 20 meters. How many meters she is from its original position?

- (A) 10 m                      (B) 30 m  
(C) 20 m                      (D) Zero meter

**Answer (C)**

Sol.



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58. If “+” means ‘ $\times$ ’, ‘ $\times$ ’ means ‘-’, ‘-’ means ‘ $\div$ ’ and ‘ $\div$ ’ means ‘+’ then  $15 \times 3 \div 2 \times 5 \div 12 \times ?$

- (A) -43.5                      (B) 18  
(C) 11                            (D) 7

**Answer (D)**

**Sol.**  $15 \div 3 - 2 \times 5 + 12$   
 $5 - 10 + 12 = 7$

59. If ‘Q’ means ‘add to’, ‘K’ means “multiply by”, “S” means “subtract from” and ‘L’ means “divide by” then,  $20 \div 2 \times 3 \times 7 - 8 = ?$

- (A) 3                              (B) 23  
(C) 22                            (D) 39

**Answer (B)**

**Sol.**  $20 \div 2 + 3 \times 7 - 8 = 23$

60. A father is now 2 times as old as his son. Five years back, he was 3 times as old as his son. The son’s age is

- (A) 5                              (B) 10                            (C) 15                            (D) 20

**Answer (B)**

**Sol.** Father age = 2 (son age)

Father age - 5 = 3 (son age - 5)

Father age = 20 years

Son’s age = 10 years

61. Today is Rakesh’s birthday. Two years from today he will be thrice as old as he was 10 years ago. How old is Rakesh today?

- (A) 14                              (B) 15  
(C) 16                              (D) 25

**Answer (C)**

**Sol.** Let Rakesh age be x

$$x + 2 = 3(x - 10)$$

$$x = 16$$

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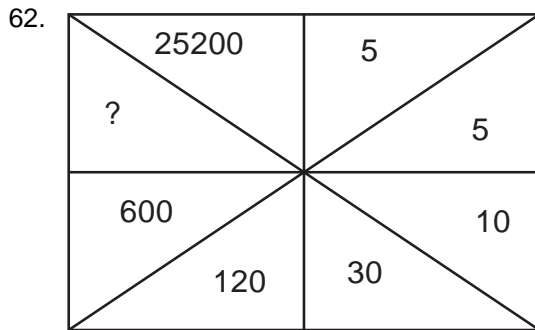
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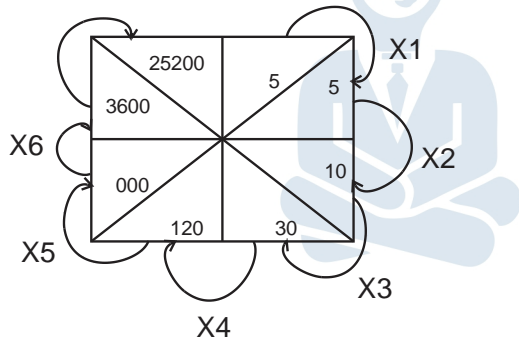
**Direction:** Find the missing number in each of the following questions from 62 to 66 and choose the correct option.



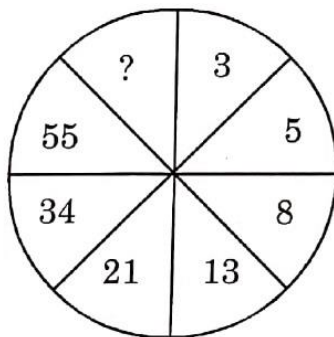
- (A) 2400                      (B) 3000  
(C) 4200                      (D) 3600

**Answer (D)**

**Sol.**



63.



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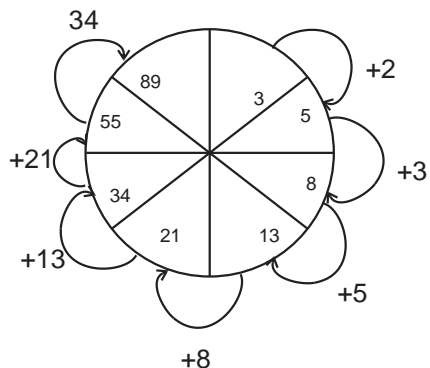




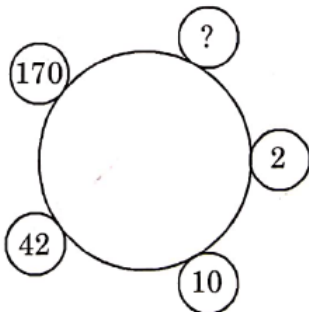
- (A) 89                      (B) 76  
(C) 110                    (D) 63

**Answer (A)**

**Sol.**



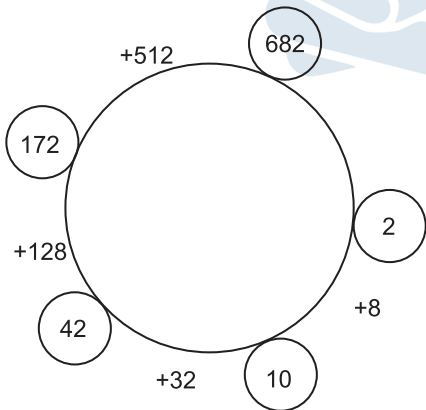
64.



- (A) 680                      (B) 682  
(C) 512                      (D) 580

**Answer (B)**

**Sol.**



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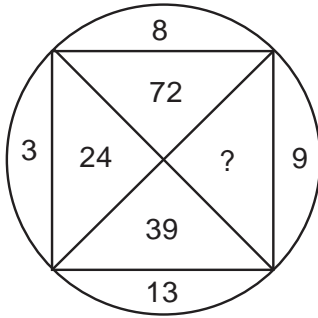
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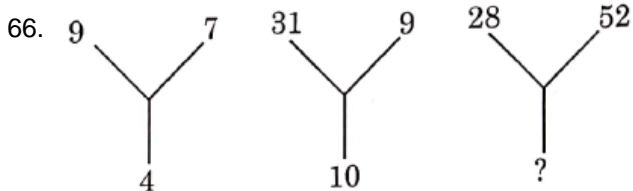
65.



- (A) 27 (B) 104  
(C) 117 (D) 130

**Answer (C)**

**Sol.**  $24 \times 3 = 72$   
 $39 \times 3 = 117$



- (A) 25 (B) 20  
(C) 15 (D) 10

**Answer (B)**

**Sol.**  $\frac{9+7}{4} = 4$   
 $\frac{31+9}{4} = 10$   
 $\frac{24+52}{4} = 20$

67. Calendar for 2016 will serve also for year -

- (A) 2021 (B) 2020  
(C) 2022 (D) 2023

**Answer** No option is correct

**Sol.** No option is correct

68. Number of times the hands of a clock are in a straight line in 24 hours is

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- (A) 22                      (B) 24  
(C) 42                      (D) 44

**Answer (A)**

**Sol.** Fact

69. Find the number which when added to itself 15 times gives 144.

- (A) 7                      (B) 8  
(C) 9                      (D) 10

**Answer (C)**

**Sol.**  $x + 15x = 144$

$$x = 89$$

70. A group of 420 persons consisting of coaches and players are there to participate in an event. For every 20 players there is a coach. Find the number of coaches in the group.

- (A) 20                      (B) 19  
(C) 18                      (D) 17

**Answer (A)**

**Sol.**  $(20)x + x = 420$

$$21x = 420$$

$$x = 20$$

**Direction:** From Question Nos. 71 to 75. Arrange the words given in each question meaningful sequence and choose the correct option.

71. (1) Word                      (2) Paragraph  
(3) Sentence                      (4) Letters  
(5) Phrase

- (A) (4), (5), (2), (3), (1)  
(B) (4), (1), (5), (3), (2)  
(C) (4), (2), (5), (1), (3)  
(D) (4), (1), (5), (2), (3)

**Answer (B)**

**Sol.** by observation

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72. (1) Police (2) Punishment  
(3) Crime (4) Judge  
(5) Judgement  
(A) (1), (2), (3), (4), (5)  
(B) (3), (1), (2), (5), (4)  
(C) (3), (1), (4), (5), (2)  
(D) (1), (3), (5), (4), (2)

**Answer (C)**

**Sol.** by observation

73. (1) Poverty (2) Population  
(3) Death (4) Unemployment  
(5) Disease  
(A) (2), (1), (4), (3), (5)  
(B) (1), (2), (4), (5), (3)  
(C) (2), (4), (5), (1), (3)  
(D) (2), (4), (1), (5), (3)

**Answer (D)**

**Sol.** by observation

74. (1) Leaf (2) Fruit  
(3) Stem (4) Root  
(5) Flower  
(A) (4), (1), (3), (5), (2)  
(B) (4), (3), (1), (5), (2)  
(C) (4), (3), (5), (1), (2)  
(D) (3), (5), (1), (2), (4)

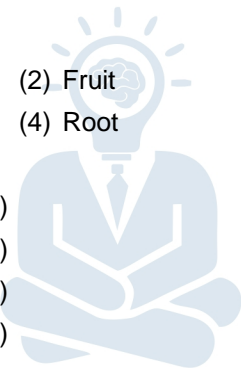
**Answer (B)**

**Sol.** by observation

75. (1) Nation (2) Village  
(3) City (4) District  
(5) State  
(A) (2), (3), (4), (5), (1)  
(B) (2), (3), (5), (4), (1)  
(C) (3), (2), (5), (4), (1)  
(D) (5), (4), (3), (1), (2)

**Answer (A)**

**Sol.** by observation



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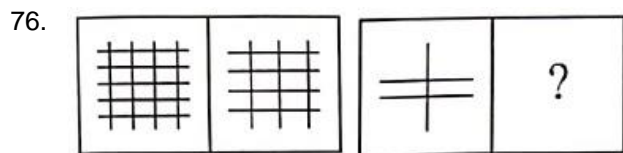
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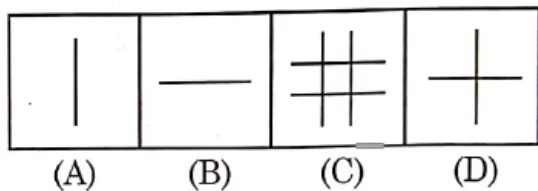
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**Direction:** From Questions Nos. 76 to 80, study and analysis the figures and identify the rule which they follow. Choose the correct option for the? place.

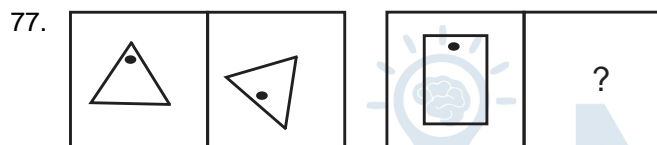


Answer figures

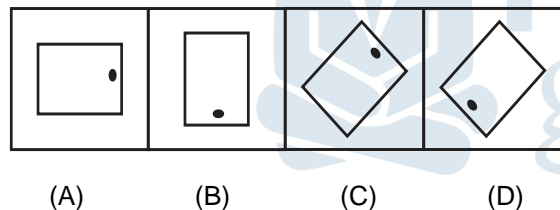


**Answer (B)**

**Sol.** by observation

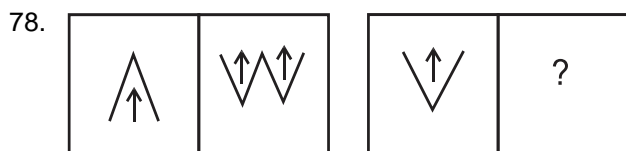


Answer figures



**Answer (D)**

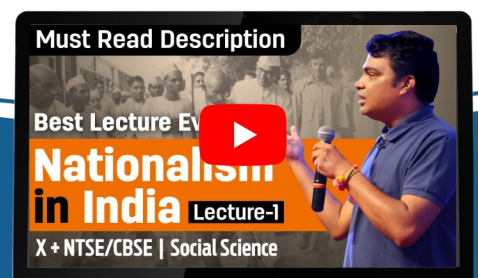
**Sol.** by observation



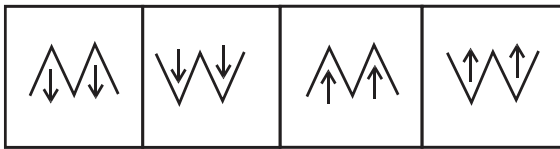
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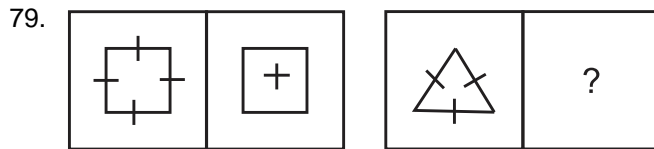
Answer figures



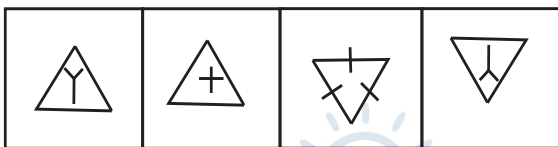
(A) (B) (C) (D)

**Answer (C)**

**Sol.** by observation



Answer figures

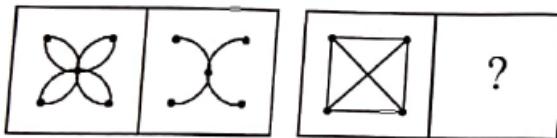


(A) (B) (C) (D)

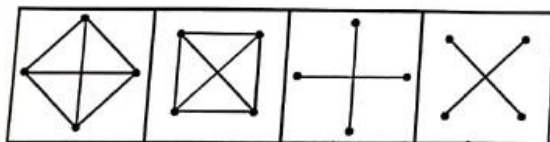
**Answer (A)**

**Sol.** by observation

80. Problem figures



Answer figures



(A) (B) (C) (D)

**Answer (D)**

**Sol.** by observation

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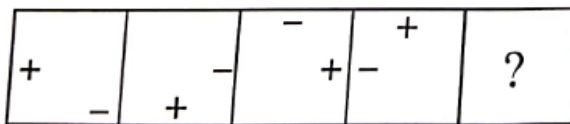


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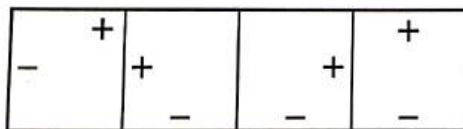
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**Direction:** In Questions Nos. 81 to 90 Problem figures has a sequence. Find the rules and select the appropriate figure from answer figure for ? place

81. Problem figures



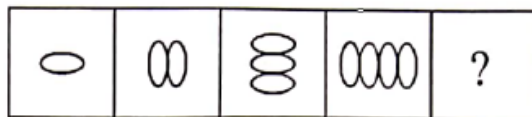
Answer figures



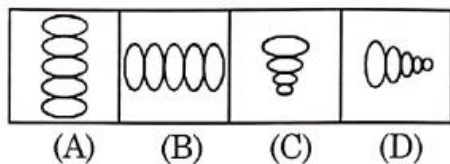
**Answer (B)**

**Sol.** by observation

82. Problem figures



Answer figures



**Answer (A)**

**Sol.** by observation

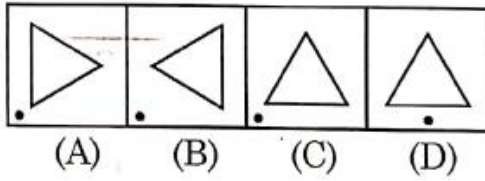
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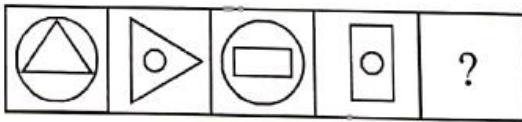


Answer figures

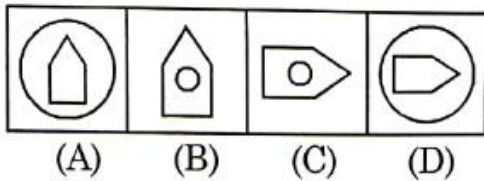


Answer: (\*)

84. Problem figures



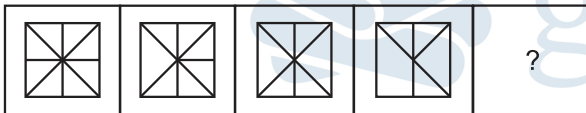
Answer figures



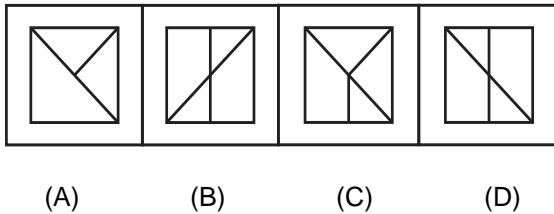
Answer (D)

Sol. by observation

85. Problem figures



Answer figures



Answer (D)

Sol. by observation

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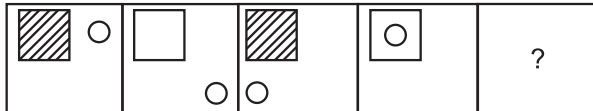
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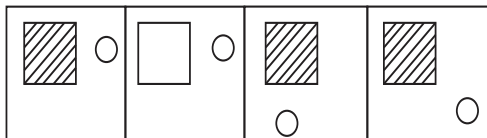




86. Problem figures



Answer figures

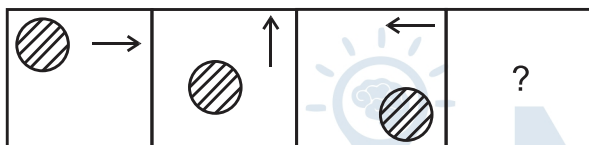


(A) (B) (C) (D)

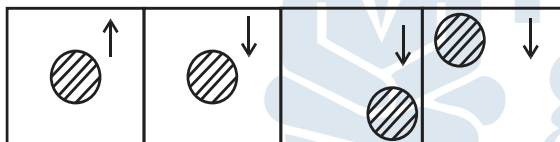
**Answer (A)**

**Sol.** by observation

87. Problem figures



Answer figures

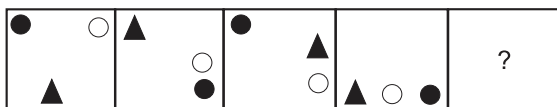


(A) (B) (C) (D)

**Answer (B) (D)\***

**Sol.** by observation

88. Problem figures



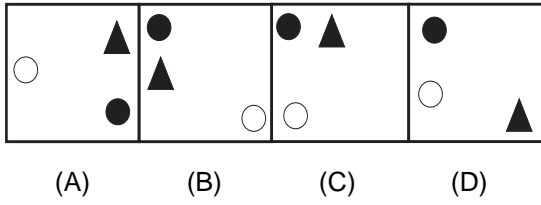
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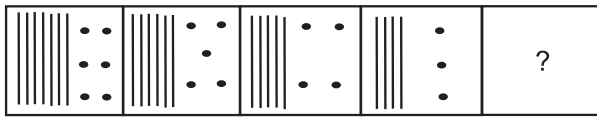
Answer figures



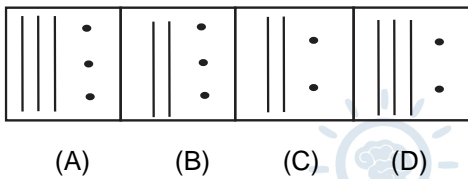
**Answer (C)**

**Sol.** by observation

89. Problem figures



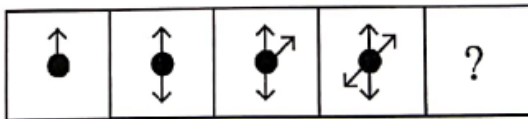
Answer figures



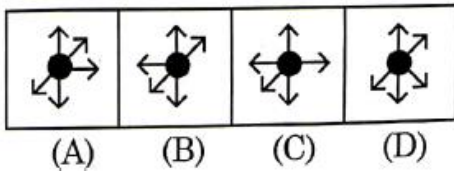
**Answer (D)**

**Sol.** by observation

90. Problem figures



Answer figures



**Answer (A)**

**Sol.** by observation

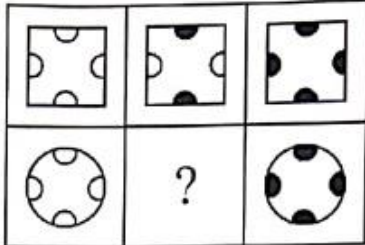


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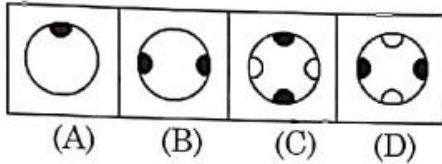


**Direction:** In each of questions from 91 to 95 complete the figures by choosing appropriate figure from answer figures

91.



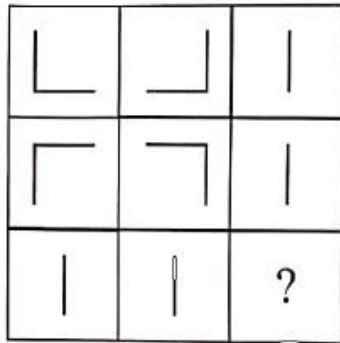
Answer figures



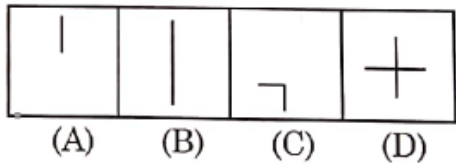
**Answer (C)**

**Sol.** by observation

92.



Answer figures



**Answer (B)**

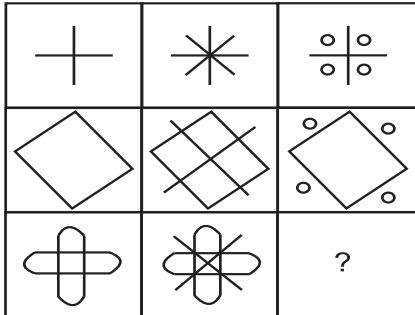
**Sol.** by observation



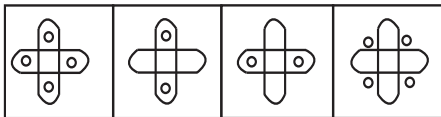
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93.



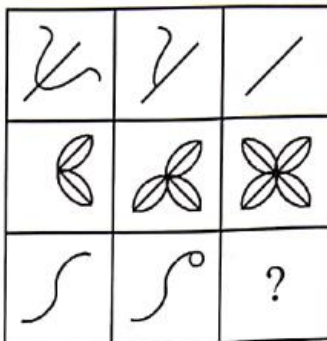
Answer figures



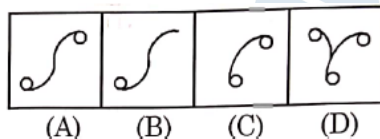
**Answer (D)**

**Sol.** by observation

94.



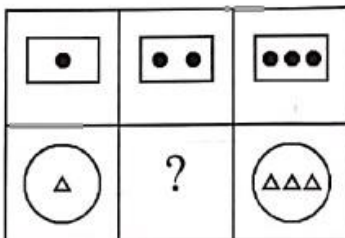
Answer figures



**Answer (A)**

**Sol.** by observation

95.



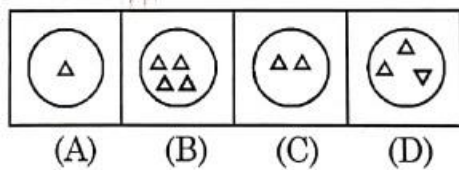
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Answer figures

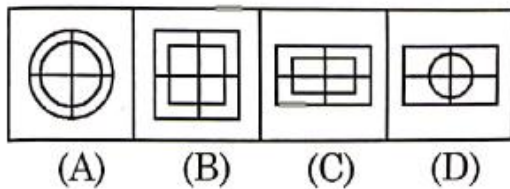


**Answer (C)**

**Sol.** by observation

**Direction:** Choose the odd figure out from the figures in Questions number 96 to 100.

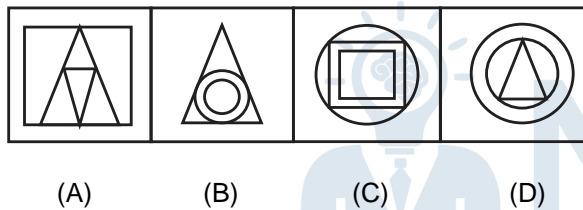
96.



**Answer (D)**

**Sol.** by observation

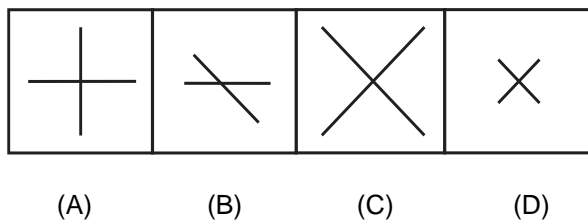
97.



**Answer (D)**

**Sol.** by observation

98.



**Answer (B)**

**Sol.** by observation

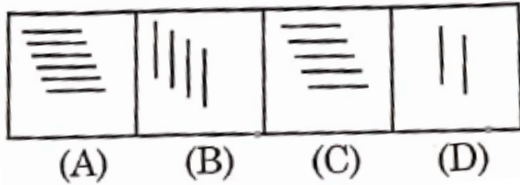
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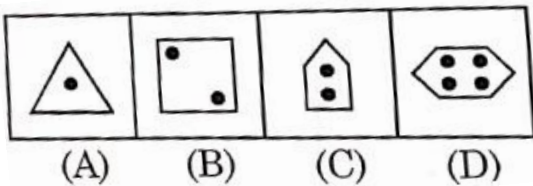
99.



**Answer (C)**

**Sol.** by observation

100.



**Answer (C)**

**Sol.** by observation



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## SAT:- PART-II: SCHOLASTIC APTITUDE TEST

101. Which of the following term does not represent electric power ( $P$ ) in electric circuit?

- (A)  $\frac{V^2}{R}$                       (B)  $IR^2$   
(C)  $I^2R$                       (D)  $VI$

**Answer (B)**

**Sol.**  $P = VI$

By ohm's law  $V = IR$

$$P = IRI = I^2R$$

$$P = \frac{V^2R}{R^2}$$

$$P = \frac{V^2}{R}$$

So  $IR^2$  doesn't represent power in an electric circuit.

102. S. I. Unit of magnetic field  $B$  is :

- (A) Newton / Ampere  $\times$  metre  
(B) Newton / Ampere  
(C) Ampere  $\times$  metre  
(D) Coulomb

**Answer (A)**

**Sol.**  $F = BIL$   $B = \frac{F}{IL} = B = \frac{\text{Newton}}{\text{Ampere} \times \text{metre}}$

103. Which of the following is an equation for position – Time relation?

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(A)  $v = u + at$                       (B)  $2as = v^2 - u^2$

(C)  $E = mc^2$                         (D)  $S = ut + \frac{1}{2}at^2$

**Answer (D)**

**Sol.**  $S = ut + \frac{1}{2}at^2$

104. Value of 1 eV is :

- (A)  $1.602 \times 10^{-15} J$     (B)  $1.602 \times 10^{-19} J$   
(C)  $1.602 \times 10^{-16} C$     (D)  $1.602 \times 10^{23} Ergs$

**Answer (B)**

**Sol.**  $1.602 \times 10^{-19} J$

105. The least distance of distinct vision for healthy eye is :

- (A) 25 km  
(B) 25 m  
(C) 25 cm  
(D) 25 mm

**Answer (C)**

**Sol.** 25 cm

106. Where does image form in the human eye?

- (A) Cornea  
(B) Pupil  
(C) Iris  
(D) Retina

**Answer (D)**

**Sol.** Retina

107. An object of mass 15 kg is moving with uniform velocity of  $4 \text{ ms}^{-1}$ . What is the kinetic energy possessed by the object?

- (A) 15 kg.  $\text{m}^2$                       (B) 120 kg.  $\text{m}^2/\text{s}^2$   
(C) 120 J/s                        (D) 240 J

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STORY**

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### Answer (B)

**Sol.**  $m = 15\text{kg}$      $v = 4\text{m/s}$

$$K.E. = \frac{1}{2}mv^2$$

$$= \frac{1}{2} \times 15 \times 4^2 \times 4$$

$$= 120 \text{ kgm}^2/\text{s}^2$$

108. The acronym 'SONAR' stands for

- (A) Sound Navigation and Ranging
- (B) Solar Navigation and Ranging
- (C) Sound Navigation and Nuclear Reaction
- (D) Sound Navigation and Rectification

### Answer (A)

**Sol.** Sound navigation and Ranging

109. Equivalent resistance in parallel combination of resistances is :

(A)  $R = R_1 + R_2 + R_3 + \dots$

(B)  $\frac{1}{R} = R_1 + R_2 + R_3 + \dots$

(C)  $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$

(D)  $R = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$

### Answer (C)

**Sol.**  $\frac{1}{\text{Equivalent}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$

110. Focal length of thin lens is given by :

(A)  $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$                       (B)  $f = u + v$

(C)  $f^2 = \frac{1}{v} - \frac{1}{u}$                       (D)  $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$



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**Answer (A)**

**Sol.**  $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

111. The device/machine to produce electric current is :

- (A) Generator                      (B) Motor  
(C) Galvanometer                (D) Ammeter

**Answer (A)**

**Sol. Generator**

112. Which of the following is used to make Solar Panel?

- (A) Cobalt                          (B) Silicon  
(C) Nickel                          (D) Manganese

**Answer (B)**

**Sol. Silicon**

113. Which of the following is a major constituent of Bio-gas?

- (A) Ethane                          (B) Oxygen  
(C) Carbon dioxide                (D) Methane

**Answer (D)**

**Sol. Methane**

114. Fatty foods become rancid due to process of -

- (A) Oxidation                        (B) Corrosion  
(C) Reduction                        (D) Hydrogenation

**Answer (A)**

**Sol. Oxidation**

115. Which of the following are physical changes?

- (a) Melting of iron metal  
(b) Rusting of iron  
(c) Bending of an iron rod  
(d) Drawing a wire of iron metal  
(A) a + b + c                        (B) a + b + d  
(C) a + c + d                        (D) b + c + d

**Answer (C)**

**Sol. a + c + d**

116. Milk is the example of the following type of colloid-

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- (A) Sol (A) Emulsion  
(C) Aerosol (D) Foam

**Answer (B)**

**Sol. Emulsion**

117. The nucleus of an atom contains-

- (A) Protons  
(B) Electrons  
(C) Protons and neutrons  
(D) Neutrons

**Answer (C)**

**Sol. Protons and neutrons**

118. By whom was neutron discovered?

- (A) Bohr (B) Chadwick  
(C) Rutherford (D) Dalton

**Answer (B)**

**Sol. Chadwick**

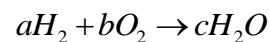
119. A chemical equation is said to be balanced if number of-

- (A) compounds are same in both side  
(B) molecules are same in both side  
(C) number of atoms are same in both side  
(D) number of electrons are same in both side.

**Answer (C)**

**Sol. Number of atoms are same in both side**

120. Write values of a, b and c so that following chemical equation is balanced-



- (A) a = 2, b = 1, c = 2 (B) a = 1, b = 1, c = 2  
(C) a = 1, b = 2, c = 1 (D) a = 2, b = 2, c = 1

**Answer (A)**

**Sol. a = 2, b = 1, c = 2**

121. Name the element which is common to all acids?

- (A) Sulphur (B) Chlorine

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- (C) Nitrogen                      (D) Hydrogen

**Answer (D)**

**Sol.** Hydrogen

122. A solution turns red litmus into blue, its is likely to be-

- (A) 1                      (B) 4                      (C) 5                      (D) 10

**Answer (D)**

**Sol.** 10

123. Dilution is the process of-

- (A) Mixing acid with water  
(B) Mixing strong acid with strong base  
(C) Mixing acid or base with water  
(D) Mixing strong acid with weak base.

**Answer (C)**

**Sol.** Mixing acid or base with water

124. What type of reaction take place when an acid is dissolved in water ?

- (A) Exothermic                      (B) Endothermic  
(C) Substitution                      (D) Elimination

**Answer (A)**

**Sol.** Exothermic

125. The ability of metals to be drawn into thin wire is know is :

- (A) Ductility                      (B) Malleability  
(C) Sonority                      (D) Conductivity

**Answer (A)**

**Sol.** Ductility

126. Which of the following non-metal is good conductor of electricity?

- (A) Graphite                      (B) Phosphorus  
(C) Hydrogen                      (D) Bromine

**Answer (A)**

**Sol.** Graphite

127. Synthesis of Bile Juice take place in Which of the following part of Body?

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- (A) Gall Bladder      (B) Liver  
(C) Nephron          (D) Hypothalamus

**Answer (B)**

**Sol.** Bile juice containing bile salts and pigments is synthesised in liver.

128. Which is Phytohormone?

- (A) Auxin              (B) Gibberellin  
(C) Cytokinin        (D) All of the above

**Answer (D)**

**Sol.** Phytohormones are plant hormones

129. pH of which of the following is acidic in nature

- (A) Gastric Juice      (B) Bile Juice  
(C) Pancreatic Juice   (D) Intestinal Juice

**Answer (A)**

**Sol.** Gastric Juice has pH of 1.8-2

130. Which of the following have Naked Seeds?

- (A) Algae              (B) Bryophyta  
(C) Gymnosperm      (D) Angiosperms

**Answer (C)**

**Sol.** Gymnosperm bear naked seed

131. Kreb's cycle found in which part of cell?

- (A) Mitochondria      (B) Cell membrane  
(C) Golgi body        (D) Nucleus

**Answer (A)**

**Sol.** Kreb's cycle occur in the matrix of Mitochondria

132. Which of the following is not found in Prokaryotes except?

- (A) Endoplasmic reticulum (B) Mitochondria  
(C) Ribosome              (D) Golgi body

**Answer (C)**

**Sol.** All cell organelles except Ribosomes are absent in prokaryotes

133. Which of the following characters are found in mammals?

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134. DNA of Eukaryotes have-

- (A) Fatty Acid
- (B) Cholesterol
- (C) Histone
- (D) All of the above

**Answer (C)**

**Sol.** Chromatin material consist of DNA wrapped around histone proteins.

135. Which of the following is monocotyledon?

- (A) Wheat
- (B) Maize
- (C) Banana
- (D) All

**Answer (D)**

**Sol.** All are monocotyledon that is they have single cotyledon inside seed.

136. Deficiency of which hormone causes diabetes mellitus?

- (A) Thyroid
- (B) Insulin
- (C) Relaxin
- (D) Parathormone

**Answer (B)**

**Sol.** Deficiency of insulin secreted by pancreas causes diabetes mellitus

137. Which of the following is/ are correct statements (s)?

- (A) Synthesis of urea takes place in liver
- (B) Eukaryotes have mitochondria
- (C) Virus is prokaryote
- (D) Both (A) and (B)

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**Answer (D)**

**Sol.** Viruses are acellular organisms.

138. Which of the following is responsible for green house effect?

- (A) O<sub>2</sub>                      (B) H<sub>2</sub>  
(C) CO<sub>2</sub>                    (D) All

**Answer (C)**

**Sol.** CO<sub>2</sub>, CH<sub>4</sub> and water vapour act as green house gases

139. Tracheal ring in human consist of following-

- (A) Hyaline cartilage    (B) Fibrous Cartilage  
(C) Bone                    (D) Muscle

**Answer (A)**

**Sol.** Tracheal rings are made up of hyaline Cartilage.

140. Human Evolution was suppose to take place in-

- (A) America                (B) Asia                    (C) Africa                    (D) Australia

**Answer (C)**

**Sol.** Human Evolution started in Africa.

**HISTORY**

141. Which is the oldest 'Veda' ?

- (A) Rigveda                (B) Samveda  
(C) Yajurveda            (D) Atharvaveda

**Answer (A)**

**Sol.** Rigveda

142. "Tripatika" is related to

- (A) Jainism                (B) Vaishya  
(C) Sanatan                (D) Buddhism

**Answer (D)**

**Sol.** Buddhism

143. Which dynasty started coins with the veena emblem ?

- (A) Maurya dynasty    (B) Gupta dynasty  
(C) Vardhan dynasty    (D) Rajput dynasty

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**Answer (B)**

**Sol.** Gupta dynasty

144. "Prayag Prashasti" was written by -

- (A) Aryabhata (B) Vishnu Sharma  
(C) Harishen (D) Kalidas

**Answer (C)**

**Sol.** Harishen

145. Who wrote Padmavat ?

- (A) Kalidas  
(B) Prithviraj  
(C) Malik Mohammad Jayasi  
(D) Dhananand

**Answer (C)**

**Sol.** Malik Mohammad Jayasi

146. Battle of Haldighati was fought in -

- (A) 1576 AD (B) 1580 AD  
(C) 1528 AD (D) 1572 AD

**Answer (A)**

**Sol.** 1576 AD

147. Who was Shivaji's mother ?

- (A) Jija Bai (B) Kamla Bai  
(C) Putli Bai (D) Durga Devi

**Answer (A)**

**Sol.** Jija Bai

148. Which ruler's reign is called Golden Age of Mughal Paintings ?

- (A) Babur (B) Jahangir  
(C) Aurangzeb (D) Shahjahan

**Answer (B)**

**Sol.** Jahangir

149. British East India Company was established in -

- (A) 1600 AD (B) 1540 AD  
(C) 1650 AD (D) 1700 AD

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**Answer (A)**

**Sol.** 1600 AD

150. Who was the last Mughal king ?

- (A) Shershah
- (B) Aurangzeb
- (C) Bahadur Shah Zahar - II
- (D) None of the above

**Answer (C)**

**Sol.** Bahadur Shah Zahar - II

151. Which Governor General started Subsidiary Alliance ?

- (A) Lord Cornwallis      (B) Lord Rippon
- (C) Lord Wellesely      (D) Lord Curzon

**Answer (C)**

**Sol.** Lord Wellesely

152. Anand Math was written by -

- (A) Swami Vivekanand
- (B) Deenbandhu Mishra
- (C) Bankimchandra Chatterjee
- (D) Ravindranath Tagore

**Answer (C)**

**Sol.** Bankimchandra Chatterjee

153. Who established the Khalsa Organisation ?

- (A) Guru Nanak Dev      (B) Guru Kripal Singh
- (C) Guru Govind Singh      (D) None of these

**Answer (C)**

**Sol.** Guru Govind Singh

154. Who was President of first session / conference of Congress?



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- (A) Dadabhai Naoroji
- (B) Arvind Ghosh
- (C) Gopal Krishna Gokhle
- (D) Vyomesh Chandra Banerjee

**Answer (D)**

**Sol.** Vyomesh Chandra Banerjee

155. Founder of 'Satya Shodhak Samaj' was -

- (A) Swami Vivekanand
- (B) Atmaram
- (C) Jyotiba Phule
- (D) Mahatma Gandhi

**Answer (C)**

**Sol.** Jyotiba Phule

## GEOGRAPHY

156. Unit of measuring noise is -

- (A) Centimeter
- (B) Decibel
- (C) Celsius
- (D) Millibar

**Answer (B)**

**Sol.** Decibel

157. Chipko Movement was started in -

- (A) Karnataka
- (B) North-East India
- (C) Uttarakhand
- (D) Kerala

**Answer (C)**

**Sol.** Uttarakhand

158. The standard time of India is calculated from -

- (A) 70° East Longitude
- (B) 80°30' East Longitude
- (C) 82°30' East Longitude
- (D) 85° East Longitude

**Answer (C)**

**Sol.** 82°30' East Longitude

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159. The Tropic of Cancer does not pass through which State of India?

- (A) Gujarat (B) Maharashtra  
(C) Chhattisgarh (D) Madhya Pradesh

**Answer (B)**

**Sol.** Maharashtra

160. Which of the following river is known as Ganga of South India ?

- (A) Narmada river (B) Krishna river  
(C) Kaveri river (D) Godavari river

**Answer (D)**

**Sol.** Godavari river

161. State with the minimum forest area in India is -

- (A) Assam (B) Rajasthan  
(C) Jharkhand (D) Haryana

**Answer (D)**

**Sol.** Haryana

162. According to 2011 census which is the most densely populated State ?

- (A) Uttar Pradesh (B) Bihar  
(C) Kerala (D) West Bengal

**Answer (B)**

**Sol.** Bihar

163. Conventional signs are certified by -

- (A) Central Information Department  
(B) Indian Constitution  
(C) Survey Department  
(D) Parliament of India

**Answer (C)**

**Sol.** Survey Department

164. Keoladeo Ghana Bird Sanctuary is located in -

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- (A) Kerala (B) Rajasthan  
(C) West Bengal (D) Madhya Pradesh

**Answer (B)**

**Sol.** Rajasthan

165. The cheapest means of transport is -

- (A) Road Transport (B) Rail Transport  
(C) Water Transport (D) Air Transport

**Answer (C)**

**Sol.** Water Transport

166. The main gas pipeline is -

- (A) Barauni - Haldia  
(B) Barauni - Jalandhar  
(C) Naharkatia - Baruni  
(D) Hajira - Jagdishpur

**Answer (D)**

**Sol.** Hajira - Jagdishpur

167. The longest railway route of the world is -

- (A) Trans Siberian Railway  
(B) Canadian Pacific Railway  
(C) Trans Indian Railway  
(D) All of the above

**Answer (A)**

**Sol.** Trans Siberian Railway

168. Weather maps are published in India -

- (A) Kolkata (B) Delhi  
(C) Pune (D) Hyderabad

**Answer (C)**

**Sol.** Pune

169. Name the area of India where earthquakes often occur (high incidence zones) -

- (A) Kutch (B) Aravali mountain  
(C) Orissa coast (D) Goa

**Answer (A)**

**Sol.** Kutch

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170. Name the most flood affected State -

- (A) Bihar (B) Punjab  
(C) Rajasthan (D) Madhya Pradesh

**Answer (A)**

**Sol.** Bihar

## CIVICS

171. In a democracy Sovereignty resides in the -

- (A) President (B) Parliament  
(C) Prime Minister (D) People

**Answer (D)**

**Sol.** People

172. The Chief Election Commissioner of India is appointed by -

- (A) President (B) Prime Minister  
(C) Governor (D) Deputy Prime Minister

**Answer (A)**

**Sol.** President

173. According to which article untouchability has been abolished by Constitution of India?

- (A) Article - 14 (B) Article - 15  
(C) Article - 16 (D) Article - 17

**Answer (D)**

**Sol.** Article - 17

174. The term of Lok Sabha is -

- (A) 3 Years (B) 4 Years  
(C) 5 Years (D) 6 Years

**Answer (C)**

**Sol.** 5 Years

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175. Where is the High Court of Madhya Pradesh state situated ?

- (A) Bhopal (B) Indore  
(C) Jabalpur (D) Gwalior

**Answer (C)**

**Sol.** Jabalpur

### ECONOMICS

176. The State having maximum population of poor, in India is -

- (A) Meghalaya (B) Assam  
(C) Bihar (D) Madhya Pradesh

**Answer (C)**

**Sol.** Bihar

177. Which of the following scheme provides 100 days of employment ?

- (A) National Rural Employment Guarantee Scheme  
(B) National Rural Health Mission  
(C) National Rural Livelihood Mission Scheme  
(D) Prime Minister Jan Dhan Scheme

**Answer (A)**

**Sol.** National Rural Employment Guarantee Scheme

178. Main function of money is -

- (A) Medium of exchange  
(B) Mode of payment  
(C) Price holding  
(D) All of the above

**Answer (D)**

**Sol.** All of the above

179. Which bank known as Central Bank of India ?

- (A) Reserve Bank of India  
(B) State Bank of India  
(C) Foreign Exchange Bank  
(D) International Bank

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**Answer (A)**

**Sol.** Reserve Bank of India

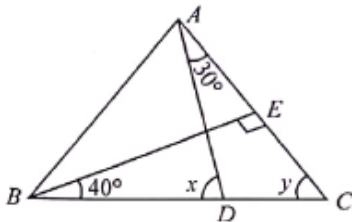
180. Producers can be arbitrary with respect to the quality and price of goods in -

- (A) Competitive market
- (B) Monopoly
- (C) Agricultural product
- (D) None of the above

**Answer (B)**

**Sol.** Monopoly

181. In the given figure, if  $BE \perp AC$ ,  $\angle EBC = 40^\circ$  and  $\angle DAC = 30^\circ$  then the value of  $\angle x$  and  $\angle y$  are:



- (A)  $80^\circ$  and  $30^\circ$
- (B)  $80^\circ$  and  $50^\circ$
- (C)  $40^\circ$  and  $50^\circ$
- (D)  $70^\circ$  and  $40^\circ$

**Answer (B)**

**Sol.** By angle sum property in  $\triangle BCE$ ,

$$y + 40 + 90 = 180$$

$$y = 50^\circ$$

By exterior angle sum property in  $\triangle ADC$ ,

$$x = y + 30^\circ$$

$$x = 50 + 30^\circ$$

$$x = 80^\circ$$

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182. A right circular cylinder is just enclosed a sphere of radius  $r$ , then:

- (A) Surface area of the is equal to the curved surface area of the cylinder.
- (B) Surface area of sphere is equal to the total surface area of the cylinder.
- (C) Surface area of the sphere is less than the curved surface area of the cylinder.
- (D) Surface area of sphere is greater than the curved surface area of the cylinder.

**Answer (A)**

**Sol.** Surface area of sphere =  $4\pi r^2$

C.S. A of cylinder

$$= 2\pi rh$$

$$= 2\pi r(2r)$$

$$= 4\pi r^2$$

183. Zeros of polynomial  $x^2 - 2x$  are :

- (A) only 2
- (B) 0, 2
- (C) 2, 2
- (D) 0, 0

**Answer (B)**

**Sol.** Zeroes of

$$x^2 - 2x$$

$$x^2 - 2x = 0$$

$$x(x - 2) = 0$$

$$x = 0 \text{ or } x = 2$$

184. The median and mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18 are :



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- (A) 18 and 14
- (B) 17 and 18
- (C) 18.5 and 14
- (D) 18 and 18.5

**Answer (A)**

**Sol.** 14, 14, 14, 14, 17, 18, 18, 18, 18, 22, 23, 25, 28

no of observation,  $n = 12$

$$\text{median} = \frac{6^{\text{th}} + 7^{\text{th}}}{2}$$

$$\frac{18 + 18}{2} = 18$$

**Mode = 14**

185. Largest chord of the circle is:

- (A) Radius
- (B) Diameter
- (C) Both A and B
- (D) None of the above

**Answer (B)**

**Sol.** Fact

186. In Euclid's division lemma, for given positive integer  $a$  and  $b$ , there exist unique integer's  $q$  and  $r$  satisfying  $a = bq + r$ , here:

- (A)  $r \neq 0$
- (B)  $0 \leq r < b$
- (C)  $r > b$
- (D)  $r = q$

**Answer (B)**

**Sol.** Fact

187. If  $3, -1, \frac{1}{3}$  are zeros of cubic polynomial  $p(x)$ ,

where  $p(x)$  is:

- (A)  $3x^3 + 5x^2 - 11x - 3$
- (B)  $3x^3 - 5x^2 - 11x + 3$
- (C)  $3x^3 - 5x^2 - 11x - 3$
- (D)  $3x^3 + 5x^2 + 11x + 3$

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**Answer (C)**

**Sol.** If  $\alpha, \beta, \gamma$  are zeroes then

$$p(x) = k[x^3 - (\alpha + \beta + \gamma)x^2 + (\alpha\beta + \beta\gamma + \gamma\alpha)x - \alpha\beta\gamma]$$

$$\alpha + \beta + \gamma = \frac{5}{3}$$

$$\alpha\beta + \beta\gamma + \gamma\alpha = \frac{-11}{3}$$

$$\alpha\beta\gamma = 3$$

$$k\left[x^3 - \frac{5}{3}x^2 - \frac{11}{3}x - 1\right]$$

$$\frac{k}{3}[3x^3 - 5x^2 - 11x - 3]$$

188. The value of  $p$  for which pair of equations  $4x + py + 8 = 0$ ,  $2x + 2y + 2 = 0$ , have unique solution is:

(A)  $p = 4$

(B)  $p = 8$

(C)  $p \neq 4$

(D)  $p \neq 2$

**Answer (C)**

**Sol.** For unique solution

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

189. Which of the following is not a quadratic equation?

(A)  $(x - 2)^2 + 1 = 2x - 3$

(B)  $x(x + 1) + 8 = (x + 2)(x - 2)$

(C)  $x(2x + 3) = x^2 + 1$

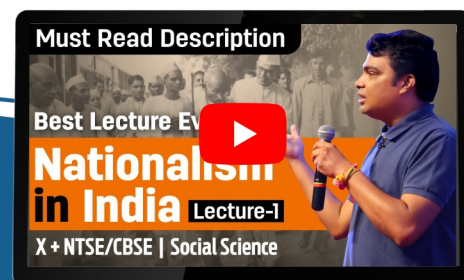
(D)  $(x + 2)^3 = x^3 + 4$

**Answer (B)**

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**Sol.**  $x(x+1)+8=(x+2)(x-2)$

$$x^2+x+8=x^2-4$$

$$x+8=-4$$

It is a linear equation

190. How many two-digit numbers are there which are divisible by 3?

- (A) 29
- (B) 30
- (C) 33
- (D) 35

**Answer (B)**

**Sol.** 12, 15, 18,....., 99

$$3 \times 4, 3 \times 5, 3 \times 6, \dots, 3 \times 33$$

$$\text{Total two-digit number} = 33 - 3 = 30$$

191. The sum of first n-positive integers is:

- (A)  $\frac{(n^2+1)}{2}$
- (B)  $\frac{(n+1)(n-2)}{2}$
- (C)  $\frac{n(n+1)}{2}$
- (D)  $2n$



**Answer (C)**

**Sol.**  $1+2+3+\dots+n = \frac{n(n+1)}{2}$

192. The point (7, 3) divides the line segment joining the points (4, -3) and (8, 5) internally in ratio:

- (A) 2 : 3
- (B) 7 : 4
- (C) 3 : 2
- (D) 3 : 1

**Answer (D)**

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**Sol.** Let (7, 3) divides the line in  $k : 1$

By section formulae

$$7 = \frac{8k + 4}{k + 1}$$

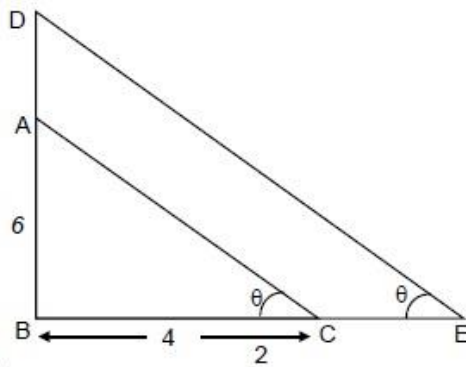
$$K = 3$$

193. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long, then the height of the tower is:

- (A) 28 m                      (B) 48 m  
(C) 53 m                      (D) 42 m

**Answer (D)**

**Sol.** Let AB be the pole of length 6 m and BC be the length of shadow 4 m



In  $\triangle ABC$

$$\tan \theta = \frac{AB}{BC} = \frac{6}{4} = \frac{3}{2}$$

In  $\triangle DBE$

$$\tan \theta = \frac{BD}{BE} = \frac{BD}{28}$$

$$\frac{3}{2} = \frac{BD}{28}$$

$$BD = 42 \text{ m}$$

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194. The length of a arc of sector of angle  $\theta$  of circle with radius  $r$  is:

(A)  $\frac{\theta}{180} \times \pi r^2$       (B)  $\frac{\theta}{360} \times \pi r^2$

(C)  $\frac{\theta}{180} \times \pi r$       (D)  $\frac{\theta}{360} \times \pi r$

**Answer (C)**

**Sol.** Length of arc =  $2\pi r \times \frac{\theta}{360}$   
 $= \pi r \times \frac{\theta}{180}$

195. The value of  $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$  is

(A) 0      (B)  $\frac{\sqrt{3}}{2}$

(C) 1      (D)  $\sqrt{3}$

**Answer (C)**

**Sol.**  $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$

$$\tan 48^\circ \tan 23^\circ \tan(90^\circ - 48^\circ) \tan(90^\circ - 23^\circ)$$

$$\tan 48^\circ \tan 23^\circ \cot 48^\circ \cot 23^\circ$$

(since  $\tan(90 - \theta) = \cot \theta$ )

$$\tan 48^\circ \tan 23^\circ \times \frac{1}{\tan 48^\circ} \times \frac{1}{\tan 23^\circ}$$

$$= 1$$

196. An iron rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness, then the radius of the wire will be:

(A)  $\frac{1}{30}$  cm      (B)  $\frac{1}{900}$  cm

(C)  $\frac{1}{3}$  cm      (D) 3 cm

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**Answer (A)**

**Sol.**  $r_1 = \frac{1}{2} \text{ cm}, h_1 = 8 \text{ cm},$

$$h_2 = 18 \text{ m} = 1800 \text{ cm},$$

$$r_2 = ?$$

Volume will be remains same.

Volume of iron rod = volume of wire

$$\pi r_1^2 h_1 = \pi r_2^2 h_2$$

$$r_2^2 = \frac{1}{900}$$

$$r_2 = \frac{1}{30} \text{ cm}$$

197. Number of terms in A. P 23, 21, 19,.....,5 are

(A) 11

(B) 10

(C) 9

(D) 8

**Answer (B)**

**Sol.**  $a = 23, d = -2, T_n = 5$

$$T_n = a + (n - 1) d$$

$$5 = 23 + (n - 1) (-2)$$

$$n = 10$$

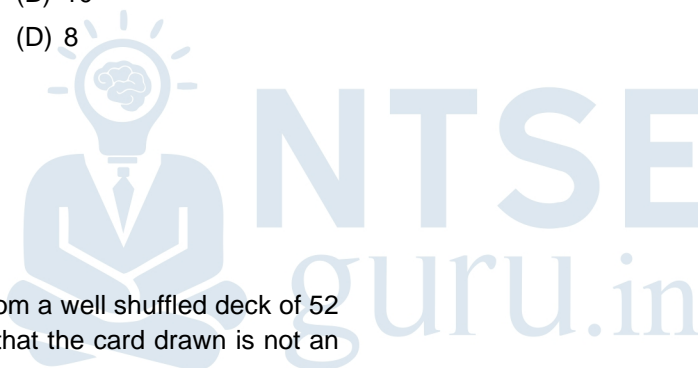
198. One card is drawn from a well shuffled deck of 52 cards, the probability that the card drawn is not an ace.

(A)  $\frac{12}{13}$

(B)  $\frac{1}{13}$

(C)  $\frac{1}{52}$

(D)  $\frac{4}{13}$



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**Answer (A)**

**Sol.** Let E be the event that card is ace

$$\text{Since, } n(E) = 4$$

$$n(S) = 52$$

$$P(E) = \frac{4}{52} = \frac{1}{13}$$

$$\text{So } P(\bar{E}) = 1 - P(E) = 1 - \frac{1}{13} = \frac{12}{13}$$

199. If  $3x^2 - x^3 + 5x - 2$  is divided by  $x - 1 + x^2$ , then the remainder is:

- (A) -3                      (B) 2  
(C) 3                        (D) -2

**Answer (B)**

**Sol.** By long division method,

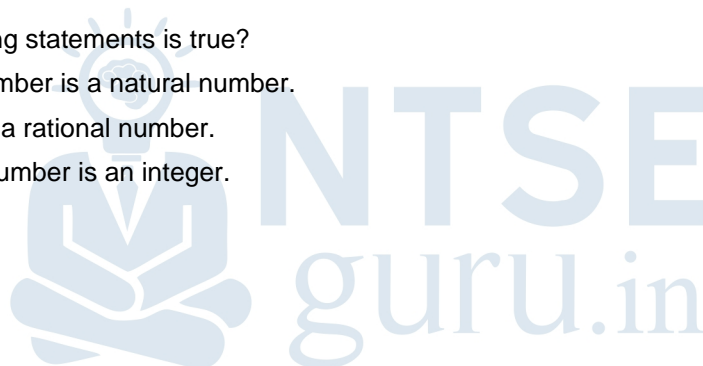
$$\text{Remainder} = 2$$

200. Which of the following statements is true?

- (A) Every whole number is a natural number.  
(B) Every integer is a rational number.  
(C) Every rational number is an integer.  
(D) None of these

**Answer (B)**

**Sol.** Fact



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