



# Aakash

Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Limited)

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## Answers & Solutions *for* NTSE (Stage-I) 2018-19

### INSTRUCTIONS TO CANDIDATES

1. Use blue/black ball point pen only. There is no negative marking.
2. This test booklet contains 200 questions of one mark each. All the questions are compulsory.
3. Section-I : MAT : 1 - 100 questions  
Section-II : SAT : 101 - 200 questions
4. Answer each question by darkening the one correct alternative among the four choices on the OMR Sheet with blue/black ball point pen.
5. Students are not allowed to scratch/alter/change out an answer once marked on OMR Sheet, by using white fluid/eraser/blade/tearing/wearing or in any other form.
6. Separate sheet has been provided for rough work in this test booklet.
7. Please handover the OMR sheet to the invigilator before leaving the Examination Hall.
8. Darken completely the ovals of your answers on OMR Sheet in the time limit allotted for that particular paper.
9. Your OMR Sheet will be evaluated through electronic scanning process. Incomplete and incorrect entries may render your OMR sheet invalid.
10. Use of electronic gadgets, calculator, mobile etc., is strictly prohibited.

**PART-I : MENTAL ABILITY TEST (MAT)**

**Directions :** In question No.1 to 10 each question has four Terms. Three terms are alike in some way. One term is different from three others. Find out the correct term which is different from three others and write its alternative number on your answer sheet against the proper question number

1. (1) Q 144 (2) M 54  
(3) U 16 (4) N 60

**Answer (4)**

**Sol.** Position of Q is 17

Then its square is  $17^2 = 289$

Now product of digit in square of position is 144.

$M=54 \Rightarrow M^2=2916 \Rightarrow 9 \times 6 \times 1 = 54$

$U=16 \Rightarrow U^2=256 \Rightarrow 4 \times 4 \times 1 = 16$

$N=60 \Rightarrow N^2=3600 \Rightarrow 6 \times 9 \times 1 = 54$  [not 60]

2. (1) Poland (2) Korea  
(3) Spain (4) Greece

**Answer (2)**

**Sol.** Korea (It is in Asia)

3. (1) Sound (2) Magnet  
(3) Light (4) Heat

**Answer (2)**

**Sol.** Magnet ( Rest are form of energy )

4. (1) 14, 9 (2) 60, 6  
(3) 37,30 (4) 53, 23

**Answer (3)**

**Sol.**  $14 = 1 \times 4 + (1+4) = 9$   
 $60 = 6 \times 0 + (6+0) = 6$   
 $37 = 3 \times 7 + 3 + 7 = 31$   
 $53 = 5 \times 3 + 5 + 3 = 23$

5. (1) May (2) July  
(3) January (4) March

**Answer (3)**

**Sol.** January month order is not prime rest month occur on prime

6. (1) 4578 (2) 3721  
(3) 2516 (4) 1328

**Answer (2)**

**Sol.** 3721. sum of digit is prime

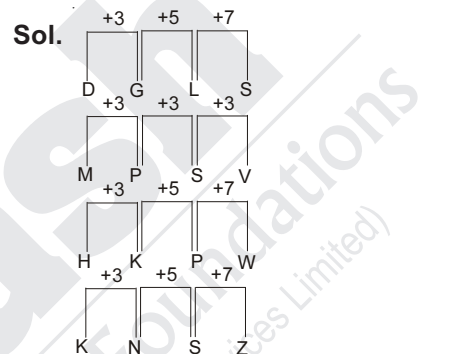
7. (1) T20 (2) IPL  
(3) PAC (4) ODI

**Answer (3)**

**Sol.** PAC, Rest terminology used in cricket.

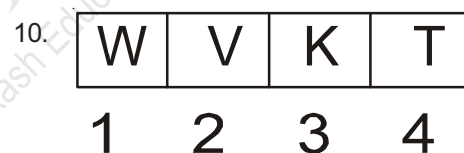
8. (1) DGLS  
(2) MPSV  
(3) HKPW  
(4) KNSZ

**Answer (2)**



9. (1) CFIL (2) GIKN  
(3) FHKN (4) LORD

**Answer (4)**



**Answer (3)**

**Sol.** K, Rest have same mirror image

**Direction :** In question 11 to 20 there are four terms in each question. The relationship that exist between the terms left to the symbol :: is the same between the terms right to the symbol ::. Out of the four terms one terms is missing each question. The missing term is one of the four alternatives given below each question. Find out the correct alternative and write its number on your answer sheet against the preper question-

11. Thermometer: Temperature:: Barometer : ?  
(1) Atmospheric Pressure  
(2) Wind speed  
(3) Weight  
(4) Blood Pressure

**Answer (1)** Atmospheric Pressure

**Sol.** Atmospheric Pressure

12. Tree:Root::Building:?

- (1) Brick
- (2) Foundation
- (3) Door
- (4) Labour

**Answer (2)**

**Sol.** Foundation

13.  $\frac{c}{x} : 72 :: \frac{G}{U} : ?$

- (1) 154
- (2) 140
- (3) 147
- (4) 126

**Answer (3)**

**Sol.** 147, Position multiplication

G U

$$7 \times 21 = 147$$

14. Rajghat: Mahatma Gandhi::Abhayghat: ?

- (1) Rajiv Gandhi
- (2) Indira Gandhi
- (3) Ch Charan Singh
- (4) Morarji Desai

**Answer (4)**

**Sol.** Morarji Desai

15.  $\frac{18}{3} : 5832 :: \frac{23}{2} : ?$

- (1) 46
- (2) 184
- (3) 92
- (4) 529

**Answer (4)**

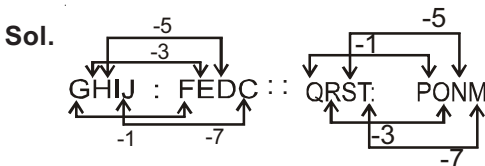
**Sol.**  $18^3 = 5832$

$$23^2 = 529$$

16. GHIJ : FEDC :: QRST : ?

- (1) MNOP
- (2) PONM
- (3) NMPO
- (4) PNMO

**Answer (2)**



17. BHC : FLG :: JPK : ?

- (1) MSP
- (2) EKF
- (3) NTO
- (4) SYT

**Answer (3)**

**Sol.** B H C : F L G :: J P K : N T O  
2 8 3    6 12 7    10 16 14 20

18. 5748 : 1120 :: 2186:?

- (1) 80
- (2) 96
- (3) 144
- (4) 32

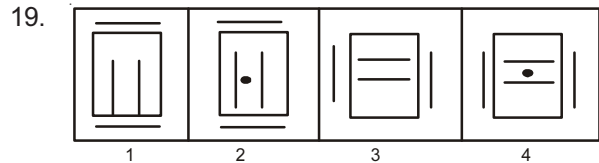
**Answer (2)**

**Sol.**  $5748 = 5 \times 7 \times 4 \times 8$

$$= 1120$$

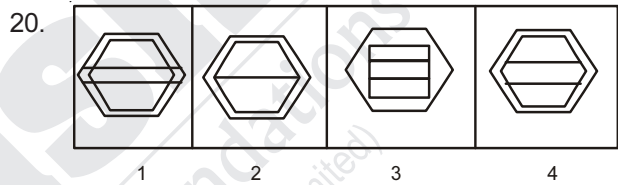
$$2186 = 2 \times 1 \times 8 \times 6$$

$$= 96$$



**Answer (1)**

**Sol.** When line come closer, dot vanish



**Answer (4)**

**Direction:** In question from 21 to 25 the letters in column I are coded in the form of numbers which are written in column II, but the orders of numbers is different. Read carefully code of letters. Find out correct answer in the given alternative and write its alternative number agains the corresponding question number on your answer sheet-

Column I	Column II
ELN	732
GLR	385
REO	574
MOJ	490
IMN	692

21. What will be the code of word OEL

- (1) 473
- (2) 673
- (3) 734
- (4) 594

**Answer (1)**

**Sol.** L → 3  
E → 7  
N → 2  
M → 9  
O → 4  
R → 5  
I → 6  
J → 0  
G → 8

22. What will be the code for word JMI

- (1) 098 (2) 089  
(3) 096 (4) 069

**Answer (3)**

23. What will be the code for word RGL

- (1) 385 (2) 583  
(3) 574 (4) 490

**Answer (2)**

24. What will be the code for word NEJ

- (1) 370 (2) 275  
(3) 285 (4) 270

**Answer (4)**

25. What will be the code for word ENM

- (1) 829 (2) 729  
(3) 629 (4) 529

**Answer (2)**

**Direction :** Question 26 to 35 are based on number/letter/figure series. In each series missing in indicated by question mark (?). Find out the missing term out of the four alternatives given below and write its alternative number against the correct question number on your answer sheet-

26. aa\_aabb\_b\_aa\_aabb\_bb?

- (1) b b b a a (2) a a b b b  
(3) b a b b a (4) b b b a a

**Answer (3)**

**Option (1) & (4) are same but correct answer is 3**

27. \_sr\_tr\_srs\_r\_rsst

- (1) t s t r t t (2) t s t t t r  
(3) t t s s r (4) t s r t s r

**Answer (2)**

28. K\_MK\_LMKKL\_KK\_MK

- (1) L K L M (2) L K M L  
(3) L K M L (4) L K M M

**Answer (2)**

29. AC\_GA\_EG\_CEGACE\_

- (1) D B A G (2) D E A G  
(3) E C A G (4) E B D G

**Answer (3)**

30. \_BO\_C\_O\_CB\_F

- (1) C F B F O (2) C F F B O  
(3) F C B F O (4) F C F B O

**Answer (1)**

31. \_DR\_E\_R\_ED\_J

- (1) E D J J R (2) E J R J R  
(3) E J D J R (4) E D J R J

**Answer (3)**

32. \_ES\_F\_S\_FE\_H

- (1) H F E H S (2) F H E H S  
(3) S H F E S (4) F E H H S

**Answer (2)**

33. \_ER\_F\_R\_FE\_J

- (1) F E J J R (2) J E F R J  
(3) E J F R J (4) F J E J R

**Answer (4)**

34. \_YL\_B\_L\_BY\_E

- (1) E B Y E L (2) B E Y E L  
(3) L E E B Y (4) Y B E L E

**Answer (2)**

35. \_\_L\_F\_LY\_R\_Y

- (1) F R L Y R F (2) Y R F L R F  
(3) F R Y R F L (4) R Y F R L F

**Answer (3)**

**Direction :** In question No. 36 to 45 the question have become wrong because of the wrong order of signs. Choose the correct order of signs from the four options given below so as to make the equation right. Write the alternative number of the correct option on the answer sheet against the corresponding question number

36.  $61 = 2 \times 200 - 78$

- (1)  $\times = -$  (2)  $- = \times$   
(3)  $= - \times$  (4)  $\times - =$

**Answer (1)**

**Sol.**  $61 \times 2 = 200 - 78$

37.  $23 + 11 \div 102 = 3$

- (1)  $\div = +$  (2)  $= + +$   
(3)  $+ = \div$  (4)  $= + \div$

**Answer (3)**

**Sol.**  $23 + 11 = 102 \div 3$

38.  $76 = 2 \div 12 + 50$

- (1)  $+ \div =$  (2)  $\div + =$   
(3)  $\div - =$  (4)  $= \times +$

**Answer (2)**

**Sol.**  $76 \div 2 + 12 = 50$

39.  $97 = 73 + 144 \times 6$

- (1)  $= - \times$                       (2)  $\div - =$   
(3)  $- = \div$                       (4)  $\div = -$

**Answer (3)**

**Sol.**  $97 - 73 = 144 \div 6$

40.  $16 = 8 \times 7 - 2 \div 12$

- (1)  $= - \times +$                       (2)  $\div = \times -$   
(3)  $\div = \times +$                       (4)  $+ = \times \div$

**Answer (2)**

**Sol.**  $16 \div 8 = 7 \times 2 - 12$

41.  $27 \times 6 = 7 - 3$

- (1)  $- = \times$                       (2)  $= \times -$   
(3)  $- \times =$                       (4)  $\times - =$

**Answer (1)**

**Sol.**  $27 - 6 = 7 \times 3$

42.  $85 \times 2 \times 95 = 75$

- (1)  $\times + =$                       (2)  $+ = \times$   
(3)  $\times = +$                       (4)  $= \times +$

**Answer (3)**

**Sol.**  $85 \times 2 = 95 + 75$

43.  $108 = 9 \div 9 + 21$

- (1)  $\div = +$                       (2)  $\div + =$   
(3)  $= + \div$                       (4)  $+ + =$

**Answer (2)**

**Sol.**  $108 \div 9 + 9 = 21$

44.  $66 \times 27 = 13 - 3$

- (1)  $- = \times$                       (2)  $= - \times$   
(3)  $\times = -$                       (4)  $= \times -$

**Answer (1)**

**Sol.**  $66 - 27 = 13 \times 3$

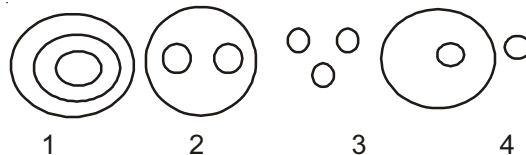
45.  $4^2 = 3^2 + 1^2 + 6$

- (1)  $- - =$                       (2)  $- - -$   
(3)  $= - -$                       (4)  $+ + +$

**Answer (1)**

**Sol.**  $16 - 9 - 1 = 6$

**Direction :** For question 46 to 55 four sets of circles has been given below. Three circles of set have some relation with each other. Question given below have three words each which are also related to each other in some way. This relation between words is similar to that in one of circles. Find it out from the four four options given below each question and write its serial number against corresponding question number on your answer sheet-



46. Family, Mother, Father

- (1) 2                                      (2) 4  
(3) 3                                      (4) 1

**Answer (1)**

47. Book, Page, Words

- (1) 3                                      (2) 4  
(3) 1                                      (4) 2

**Answer (3)**

48. Math, Alezebra, Geography

- (1) 2                                      (2) 1  
(3) 4                                      (4) 3

**Answer (3)**

49. Hindi, Math, Science

- (1) 3                                      (2) 4  
(3) 1                                      (4) 2

**Answer (1)**

50. House, Door, Window

- (1) 3                                      (2) 4  
(3) 1                                      (4) 2

**Answer (4)**

51. Year, Month, Weather

- (1) 3                                      (2) 4  
(3) 1                                      (4) 2

**Answer (2)**

52. Asia, India, Kerala

- (1) 3                                      (2) 4  
(3) 1                                      (4) 2

**Answer (3)**

53. Mahesh Bupati, Ajiagya Rahare, Sangram Singh

- (1) 3                                      (2) 4  
(3) 1                                      (4) 2

**Answer (1)**

54. Uttar Pradesh, Agra, Tajmahal

- (1) 3 (2) 4  
(3) 1 (4) 2

**Answer (3)**

55. Raipur, Ranchi, Patna

- (1) 3 (2) 4  
(3) 1 (4) 2

**Answer (1)**

56. In a code language CFJN is written as EINS. What will be code of GIOT in the same language

- (1) LRIY (2) ILRY  
(3) RIYL (4) YRIL

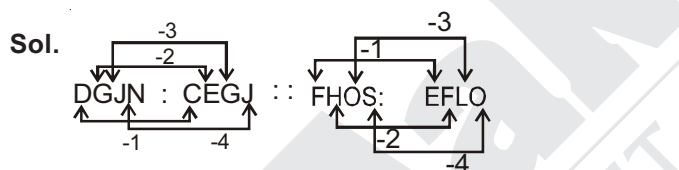
**Answer (Deleted)**

**Sol. Answer should be ILSY**

57. In a code language DGJN is written as CEGJ. What will be code of FHOS in the same language

- (1) FOEL (2) OFLE  
(3) LEFO (4) EFLO

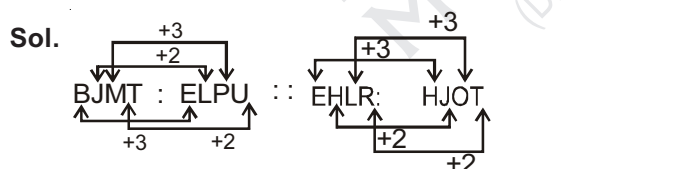
**Answer (4)**



58. In a code language BJMT is written as ELPV. What will be code of EHLR in the same language

- (1) HJOT (2) TOJH  
(3) OTJH (4) JOHT

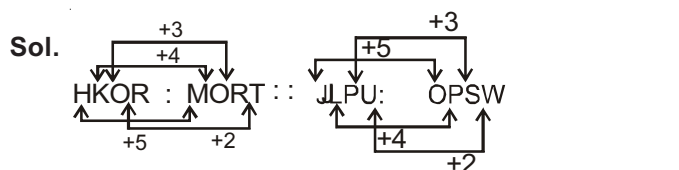
**Answer (1)**



59. If in a code language HKOR is written as MORT. What will be code of JLPU in the same language

- (1) PSWO (2) SWOP  
(3) OPSW (4) WOPS

**Answer (3)**



60. If in a certain code language BREAD is written as 30. What will be code of NURSE in the same language

- (1) 82 (2) 63  
(3) 72 (4) 77

**Answer (4)**

**Sol.** Sum of Position of letters

**Direction :** Question No. 61 to 65 based on the information carefully, and find out the correct answer from the four alternative and write its alternative number on your answer sheet against the proper question number

There are five persons P, Q, R, S and T. One is football player, one is chess player, and one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player.

61. Who is the football player

- (1) P (2) Q  
(3) R (4) S

**Answer (2)**

**Sol.** P (Unmarried Female)

Q (Male) → Play football & brother of R

R (Married Female) → Play Hockey & wife of T

S (Unmarried Female)

T (Male) → Chess

62. Who is the hockey player

- (1) P (2) Q  
(3) R (4) T

**Answer (3)**

63. Who is the chess player

- (1) T (2) S  
(3) P (4) Q

**Answer (1)**

64. Who is the wife of T

- (1) P (2) Q  
(3) R (4) S

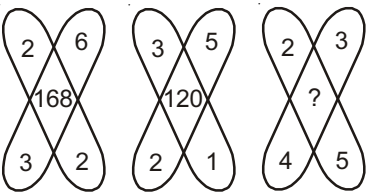
**Answer (3)**

65. The three ladies are

- (1) P, Q, R (2) Q, R, S  
(3) P, Q, S (4) P, R, S

**Answer (4)**

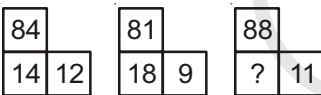
**Direction :** Question No. 66 to 70 number are placed in figure on the basis of some rules. One palce is vacant which is indicated as (?). Find out the correct alternative for the vacant place and write its number against the proper question number on your answer sheet.

66. 

(1) 84 (2) 195  
(3) 240 (4) 140

**Answer (2)**


**Sol.**  $(2 + 6 + 3 + 2)^2 - 1 = 168$   
 $(3 + 5 + 2 + 1)^2 - 1 = 120$   
 $(2 + 3 + 4 + 5)^2 - 1 = 195$

67. 

(1) 16 (2) 21  
(3) 61 (4) 81

**Answer (1)**

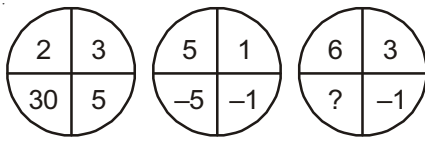
**Sol.**  $\frac{12 \times 14}{2} = 84$   
 $\frac{8 \times 9}{2} = 81$   
 $\frac{x \times 11}{2} = 88$   
 $x = 16$

68. 

(1) 13 (2) 15  
(3) 17 (4) 19

**Answer (2)**

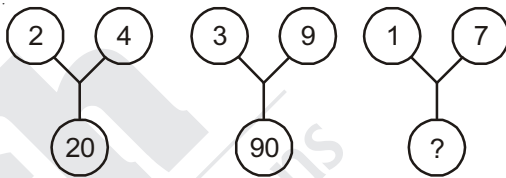
**Sol.**  $\frac{25 + 17}{7} = 6$   
 $\frac{38 + 18}{7} = 8$   
 $\frac{89 + 16}{7} = 15$

69. 

(1) -9 (2) -18  
(3) 18 (4) 8

**Answer (2)**

$2 \times 3 \times 5 = 30$   
 $5 \times 1 \times -1 = -5$   
 $6 \times 3 \times -1 = -18$

70. 

(1) 20 (2) 25  
(3) 50 (4) 75

**Answer (3)**

$2^2 + 4^2 = 20$   
 $3^2 + 9^2 = 90$   
 $1^2 + 7^2 = 50$

71. Gopal shorter than Krishan. Mohan taller than Girdhar, Gopal taller than Mohan, Krishan shorter than Murli, Respectively, who's tallest and shortest

(1) Murli, Mohan (2) Girdhar, Murli  
(3) Murli, Girdhar (4) Gopal, Girdhar

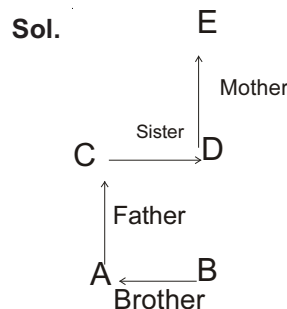
**Answer (3)**

**Sol.** Girdhar < Mohan < Gopal < Krishna < Murli

72. A and B respectively brother and sister, If C father of A, D sister of C and E mother of D then what relationship of B to E

(1) Grand daughter (2) Mother  
(3) Maternal aunty (4) Daughter

**Answer (1)**



73. If 1st October is Sunday, then 1st November will be

- (1) Monday                      (2) Tuesday  
(3) Wednesday                (4) Thursday

**Answer (3)**

**Sol.** Wednesday

74. How many days will there be from 26th January 2004 to 15th May 2004 (both days included)

- (1) 110                              (2) 111  
(3) 112                              (4) 113

**Answer (2)**

75. Two person are working facing one an other. If the face of the first person is towards the east. In which direction will be the right hand of the second person

- (1) East                              (2) West  
(3) North                            (4) South

**Answer (3)**

76. A person is going toward south then turns to the right then turns left, again turns to left now in which direction is he going

- (1) East                              (2) West  
(3) North                            (4) South

**Answer (1)**

77. A man is going towards the north, then took three left turns now in which direction is he going

- (1) East  
(2) West  
(3) North  
(4) South

**Answer (1)**

78. Two person are sitting back to back. If the first person's face is towards the south. In which direction will be the left hand of the second person

- (1) East                              (2) West  
(3) North                            (4) South

**Answer (2)**

79. A student walk's  $\frac{1}{2}$  Km to the left from his school, then turns to the right and walks  $1\frac{1}{2}$  Km, then he turns right and walk  $\frac{1}{2}$  Km. Now how far is he from his school

- (1)  $\frac{1}{2}$  Km  
(2) 1 Km  
(3)  $1\frac{1}{2}$  Km  
(4)  $2\frac{1}{2}$  Km

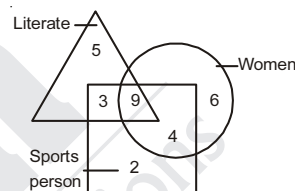
**Answer (3)**

80. Red, Pink, Purple, Yellow and White coloured flowers are put in a garland in sequential order. Which colour of flower will be there at the 18th place

- (1) Red                              (2) Pink  
(3) Purple                            (4) Yellow

**Answer (3)**

**Direction :** Question 81 to 85 are based on the following figure. Triangle represents literate person, circle represents women and square represents sports persons. See the picture carefully and find out the correct alternative and write its number on your answer sheet



81. How many persons are literate

- (1) 5                                      (2) 17  
(3) 3                                      (4) 8

**Answer (2)**

82. How many women are literate

- (1) 6                                      (2) 4  
(3) 19                                    (4) 9

**Answer (4)**

83. How many sport women are there

- (1) 4                                      (2) 2  
(3) 13                                    (4) 7

**Answer (3)**

84. How many persons are literate but not women

- (1) 9                                      (2) 8  
(3) 12                                    (4) 17

**Answer (2)**

85. How many sports women are not literate

- (1) 6                                      (2) 10  
(3) 4                                      (4) 19

**Answer (3)**

86. The average of 4.86 gm, 5.69 gm, 5.12 gm, 4.17 gm, 4.95 gm, 5.04 gm is

- (1) 5.06 gm                            (2) 4.96 gm  
(3) 5.00 gm                            (4) 4.59 gm

**Answer (2)** According to question in english

(1) According to question in Hindi



87. How many times in a day the hands of a clock are straight pointing opposite each other

- (1) 20 (2) 12  
(3) 24 (4) 22

**Answer (4)**

88. In a group of cows and hens, the number of legs was 14 more than the twice of the number of heads. The number of cows was

- (1) 5 (2) 7  
(3) 10 (4) 14

**Answer (2)**

**Sol.** Let  $x$ =cow,  $y$ =hen

$$4x+2y=14+2x+2y$$

$$x=7$$

89. The ascending order of the following fractions

$$\frac{2}{3}, \frac{4}{5}, \frac{3}{8}, \frac{1}{2} \text{ is}$$

- (1)  $\frac{2}{3}, \frac{4}{5}, \frac{3}{8}, \frac{1}{2}$  (2)  $\frac{2}{3}, \frac{4}{5}, \frac{1}{2}, \frac{3}{8}$   
(3)  $\frac{4}{5}, \frac{2}{3}, \frac{1}{2}, \frac{3}{8}$  (4)  $\frac{3}{8}, \frac{1}{2}, \frac{2}{3}, \frac{4}{5}$

**Answer (4)**

**Sol.**  $\frac{80}{120}, \frac{96}{120}, \frac{45}{120}, \frac{60}{120}$

90. Value of  $(16)^{\frac{3}{4}}$  is

- (1) 12 (2) 16  
(3) 48 (4) 8

**Answer (4)**

**Direction :** The question no. 91 to 95 are based on the logical sequence of the words. In each question is given 4, 5 or 6 words which has to be rearranged in a logical order. The words should be so arranged that they are based on actual meaning and process

91. 1. Birth 2. Death 3. Funeral 4. Marriage 5. Education

- (1) 1, 3, 4, 5, 2 (2) 4, 5, 3, 1, 2  
(3) 1, 5, 4, 2, 3 (4) 2, 3, 4, 5, 1

**Answer (3)**

92. 1. Treatment 2. Doctor 3. Disease 4. Diagnose 5. Medicine

- (1) 3, 2, 4, 5, 1 (2) 2, 4, 3, 5, 1  
(3) 4, 3, 2, 5, 1 (4) 4, 2, 3, 5, 1

**Answer (1)**

93. 1. Hecto 2. Centi 3. Deca 4. Kilo 5. Deci

- (1) 1, 3, 4, 5, 2 (2) 1, 5, 3, 4, 2  
(3) 2, 5, 3, 1, 4 (4) 5, 2, 1, 4, 3

**Answer (3)**

94. Major 2. Captain 3. Colonel 4. Brigadier 5. Lieutenant General

- (1) 5, 4, 3, 1, 2 (2) 5, 1, 4, 2, 3  
(3) 2, 5, 3, 1, 4 (4) 5, 2, 1, 4, 3

**Answer (1)**

95. 1. Wall 2. Sail 3. House 4. Room 5. Brick

- (1) 5, 2, 1, 4, 3 (2) 2, 5, 4, 1, 3  
(3) 2, 5, 1, 4, 3 (4) 1, 2, 3, 4, 5

**Answer (Delete)**

**Wrong spelling words in both english and Hindi**

**Direction :** Question No. 96 to 100 are based on the following information. Read the information carefully and choose the correct alternative from four alternative given below each question and write its alternative number against proper question number on your answer sheet.

**Information** – A man has five sons, named A, B, C, D and E in which C is elder than D but younger than B. B is elder than A and C but younger than E. A is elder than D but younger than C.

96. Who is the youngest son

- (1) A (2) D  
(3) B (4) E

**Answer (2)**

97. Who is the eldest son

- (1) A (2) B  
(3) E (4) C

**Answer (3)**

98. Who is at the middle order

- (1) D (2) A  
(3) E (4) C

**Answer (4)**

99. From whom B is younger

- (1) B–E (2) A–B  
(3) B–D (4) E–A

**Answer (1)**

100. Who is the at the second last from youngest

- (1) B (2) D  
(3) A (4) E

**Answer (3)** According to question in hindi

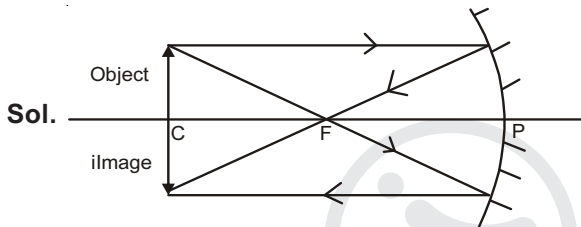
(1) According to question in english

**PAPER-II : SCHOLASTIC APTITUDE TEST (SAT)**

101. An object is placed at the centre of curvature of concave mirror. Its image is formed at-

- (1) infinite
- (2) centre of Curvature
- (3) pricipal Focus
- (4) pole of the concave mirror

**Answer (2)** Centre of Curvature



102. In a conducting wire 15 coulomb charge flows in 5 second, The current flowing in conductor is-

- (1) 3 Ampere
- (2) 5 Ampere
- (3) 15 Ampere
- (4) 75 Ampere

**Answer (1)**

**Sol.**  $Q=15c$  and  $t=5sec$

$$\text{As } I = \frac{Q}{T} = \frac{15}{5} = 3 \text{ Ampere}$$

103. The image of an object is formed by the human eye at its-

- (1) cornea
- (2) iris
- (3) pupil
- (4) retina

**Answer (4)**

**Sol.** Retina

104. One kilowatt hour is equal to-

- (1) 1 Kilojoule
- (2) 36 Kilojoule
- (3) 3600000 Joule
- (4) 360000 Joule

**Answer (3)**

**Sol.** 1kwh=energy consumed in 1hour at the rate of 1000J/s or (1kw)

$$1kwh=1kw \times 1h=1000w \times 3600s=3600000J$$

105. The device used for producing electric current is called-

- (1) generator
- (2) galvanometer
- (3) ammeter
- (4) motor

**Answer (1)**

**Sol.** generator

106. Light enters from air to glass. If refractive index of glass is 1.5 and speed of light in air  $3 \times 10^8$  m/s. Then speed of light in glass will be-

- (1)  $4.5 \times 10^8$  m/s
- (2)  $3.0 \times 10^8$  m/s
- (3)  $1.5 \times 10^8$  m/s
- (4)  $2.0 \times 10^8$  m/s

**Answer (4)**

**Sol.**  $2 \times 10^8$  m/s

$$\text{Speed of light in a medium} = \frac{\text{speed of light in vaccum}}{\text{refractive index of medium}}$$

$$V = \frac{C}{\mu} = \frac{3 \times 10^8}{1.5} = 2 \times 10^8 \text{ m/s}$$

107. An electric bulbs is rated 220V and 100W. It is operated on 110V, then the power consumed will be-

- (1) 100 watt
- (2) 75 watt
- (3) 25 watt
- (4) 50 watt

**Answer (3)**

**Sol.**  $P_A = \frac{(V_A)^2}{R}$ ;  $V_A=220\text{volt}$

$$\Rightarrow 100 = \frac{(220)^2}{R} \text{ (1)}$$

$$P_B = \frac{(V_B)^2}{R}$$
;  $V_B=110\text{volt}$

$$\Rightarrow P_B = \frac{(110)^2}{R} \text{ (2)}$$

Dividing (1) by (2)

$$\frac{100 = (220)^2 / R}{P_B = (110)^2 / R} \Rightarrow P_B = 25\text{watt}$$

108. The focal length of a convex lense is 20cm. Its power is-

- (1) 20 dioptr
- (2) 5 dioptr
- (3)  $\frac{1}{5}$  Dioptr
- (4)  $\frac{1}{20}$  dioptr

**Answer (2)**

**Sol.** Power of a lens =  $\frac{1}{f(\text{in meter})}$

$$F=20\text{cm}=0.2\text{m}$$

$$\therefore P = \frac{1}{0.2} = 5\text{Dioptr}$$

109. An object is placed at a distance of 10cm from a convex mirror of focal length 15cm. The distance of image from the mirror is-

- (1) 15 cm                      (2) 10 cm  
 (3) 6 cm                        (4) 4 cm

**Answer (3)**

**Sol.**  $u = -10\text{cm}$ ,  $f = +15\text{cm}$

using mirror formula,  $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$$\text{or, } \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{15} - \left(\frac{-1}{10}\right) = \frac{1}{15} + \frac{1}{10} = \frac{2+3}{30} = \frac{5}{30} = \frac{1}{6}$$

$$v = 6 \text{ cm}$$

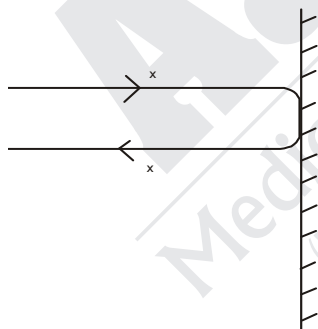
110. If the velocity of sound in air is 340 m/sec and  $x$  is the minimum distance between sound source and reflecting surface to get echo from general sound, then-

- (1)  $x = 17 \text{ m}$                       (2) 51 m  
 (3)  $x = 34 \text{ m}$                       (4) 68 m

**Answer (1)**

**Sol.** The sensation of sound persists in our brain about 0.1 second. Therefore to hear a distinct echo the time interval between the original sound and the reflected sound must be at least 0.1s

$\therefore$  Minimum distance between sound source and reflecting surface to get echo is



$$2x = v \times t = 340 \times 0.1 \Rightarrow x = \frac{340}{10 \times 2} \Rightarrow x = 17 \text{ m}$$

111. Which of the following cell is used in the communication satellite-

- (1) Dry cell  
 (2) Solar cell  
 (3) Voltaic cell  
 (4) Daniel cell

**Answer (2)**

**Sol.** Solar Cell

112. If  $V_1$  and  $V_2$  are the volume of one gm water at  $0^\circ\text{C}$  and  $4^\circ\text{C}$  respectively, then-

- (1)  $V_1 > V_2$                       (2)  $V_1 = V_2$   
 (3)  $V_1 < V_2$                       (4)  $V_1 \leq V_2$

**Answer (1)**

**Sol.** On decreasing temperature of water from  $4^\circ$  to  $0^\circ\text{C}$ , its density decreases

$\therefore$  volume increases

$\therefore V_1 > V_2$

113. A piece of wire of resistance  $R$  is cut into 5 equal parts. These parts are then connected in parallel. If the equivalent resistance of this combination is  $R^1$

then the ratio  $\frac{R}{R^1}$  is-

- (1)  $\frac{1}{25}$                                   (2) 5  
 (3)  $\frac{1}{5}$                                   (4) 25

**Answer (4)**

**Sol.** When we cut resistance  $R$  into 5 equal part then resistance of each part become  $\frac{R}{5}$

When we connect 5 resistance in parallel then its resistance become

$$R^1 = \frac{R}{5} = \frac{R}{25}$$

$$\therefore \frac{R}{R^1} = \frac{R}{\frac{R}{25}} = 25$$

114. The formulae of an oxide of an element  $M$  is  $MO$ . The formulae of its phosphate is-

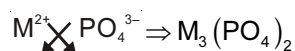
- (1)  $M_3(\text{PO}_4)_2$                       (2)  $\text{MPO}_4$   
 (3)  $M_2(\text{PO}_4)_3$                       (4)  $M_3\text{PO}_4$

**Answer (1)**

**Sol.** Formula of oxide =  $MO$

valency of  $M$  will be 2

so formula of phosphate



115. Dry ice is-

- (1) Freon                                  (2) Liquid Chlorine  
 (3) Solid Carbondioxide              (4) Plaster of Paris

**Answer (3)**

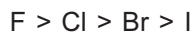
**Sol.** Dry ice is solid  $\text{CO}_2$

116. Which of the following has the maximum electronegativity-

- (1) Cl (2) F  
(3) Br (4) I

**Answer (2)**

**Sol.** Electronegativity order of halogens

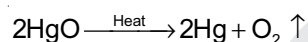


117. The metal oxide which decomposes on heating-

- (1) ZnO (2)  $Al_2O_3$   
(3) MgO (4) HgO

**Answer (4)**

**Sol.** Oxide of least reactive metal on heating decompose.



118. Cinnabar is an ore of which metal-

- (1) Al (2) Cu  
(3) Hg (4) Zn

**Answer (3)**

**Sol.** Cinnabar is HgS. Which is an ore of Hg

119. The functional group of ethanal is-

- (1)  $>C=O$  (2)  $-CHO$   
(3)  $-OH$  (4)  $-COOH$

**Answer (2)**

**Sol.** Formula of ethanal is  $CH_3CHO$

So functional group will be  $-CHO$

120. The pH value of pure water is-

- (1) 0 (2) 14  
(3) 1 (4) 7

**Answer (4)**

**Sol.** Pure water is neutral so its pH will be 7

121. The IUPAC name of  $C_2H_5OH$  is-

- (1) Ethanol (2) Methanol  
(3) Methanal (4) Ethanal

**Answer (1)**

**Sol.** IUPAC name of  $C_2H_5OH$  is Ethanol.

122. In which of the following oxalic acid is found naturally-

- (1) Curd (2) Tamarind  
(3) Tomato (4) Lemon

**Answer (3)**

**Sol.** Curd  $\rightarrow$  Lactic acid, Tamarind  $\rightarrow$  Tartaric acid

Tomato  $\rightarrow$  Oxalic acid, Lemon  $\rightarrow$  Citric acid

123. 15 ml of NaOH solution gets completely neutralised with 10 ml of HCl solution. What volume of the same HCl solution will be required to neutralise 30 ml of the same NaOH solution-

- (1) 5 ml (2) 10 ml  
(3) 15 ml (4) 20 ml

**Answer (4)**

**Sol.** 15 ml of NaOH solutions neutralised

= 10 ml HCl solution

30 ml of NaOH solution neutralised

$$= \frac{10}{15} \times 30 = 20 \text{ ml HCl solution}$$

124. The chemical formulae of baking Soda is-

- (1)  $NH_4Cl$  (2)  $NaHCO_3$   
(3)  $Na_2CO_3$  (4) NaCl

**Answer (2)**

**Sol.** Baking soda  $\rightarrow NaHCO_3$

125.  $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$

The type of the above reaction is-

- (1) Addition Reaction  
(2) Double displacement reaction  
(3) Dissociation reaction  
(4) Displacement reaction

**Answer (4)**

**Sol.** Displacement reaction

126. Aluminium carbide is treated with water, we get-

- (1) Ethylene (2) Ethane  
(3) Methane (4) Acetylene

**Answer (3)**

**Sol.**  $Al_4C_3 + 12H_2O \rightarrow 4Al(OH)_3 + 3CH_4$  (Methane)

127. Number of male gametes present in pollen tube are

- (1) 1 (2) 2  
(3) 3 (4) 4

**Answer (2)**

**Sol.** Number of male gametes in pollen grain are 2

128. Which of the following is an animal hormone?

- (1) Auxin (2) Gibberellin  
(3) Insulin (4) Abscisic Acid

**Answer (3)**

**Sol.** Insulin is the animal hormone secreted by  $\beta$  cells in pancreas

129. The source of Oxygen released during photosynthesis is

- (1) Carbon dioxide      (2) Water  
(3) Glucose              (4) Chlorophyll

**Answer (2)**

**Sol.** Source of Oxygen released during photosynthesis is water, during photolysis of water in light dependent reaction.

130. Which of the following is known as 'Currency of Energy'-

- (1) DNA                      (2) RNA  
(3) ATP                      (4) NAD

**Answer (3)**

**Sol.** Currency of energy is ATP produced in power house of the cell called mitochondria.

131. Food synthesized in leaf is transported by-

- (1) Xylem                      (2) Phloem  
(3) Cambium              (4) Epidermis

**Answer (2)**

**Sol.** Food synthesized in leaves is translocated through Phloem.

132. This organ controls the reflex actions-

- (1) Spinal Cord              (2) Heart  
(3) Liver                      (4) Kidney

**Answer (1)**

**Sol.** Spinal cord is the part of central nervous system that controls most of the reflex actions which are involuntary rapid actions of human body

133. In herbaceous plants 'guttation' takes place by-

- (1) Stomata                      (2) Hydathodes  
(3) Root hair                      (4) Flowers

**Answer (2)**

**Sol.** Guttation takes place through hydathodes these are structure present at the margins of leaf veins.

134. Which of the following is also known as the master gland-

- (1) Thyroid gland  
(2) Parathyroid gland  
(3) Adrenal gland  
(4) Pituitary gland

**Answer (4)**

**Sol.** Pituitary gland is known as master gland.

135. Which of the following group of plants are also called as naked-seeded plants-

- (1) Algae                      (2) Ferns  
(3) Gymnosperms              (4) Moss

**Answer (3)**

**Sol.** Naked seeds are that of Gymnosperms which is subdivision of division spermatophyta which are seed bearing plants.

136. Which of the following is the genetic material-

- (1) Protein                      (2) Carbohydrate  
(3) Vitamin                      (4) Nucleic Acid

**Answer (4)**

**Sol.** Nucleic Acid which includes DNA (Deoxyribo Nucleic Acid) and RNA (Ribo Nucleic Acid) are the genetic material

137. Who is known as 'father of genetics'-

- (1) Johan Gregor Mendel (2) Lamarck  
(3) Charles Darwin              (4) Hugo de Vries

**Answer (1)**

**Sol.** Father of genetics is "Gregor Johan Mendel" he was the first scientist who made a systematic study of pattern of inheritance of characters from parents to progeny.

138. Which of the following food material is made up of fungi-

- (1) Chilgoza                      (2) Mushroom  
(3) Papaya                      (4) Mango

**Answer (2)**

**Sol.** Fungi that is edible is Mushroom (*Agaricus*)

139. How many chambers are there in frog's heart-

- (1) 1                              (2) 2  
(3) 3                              (4) 4

**Answer (3)**

**Sol.** Frog's have "3 chambered" Heart with 2 auricles and 1 ventricle

140. Which of the following phytohormone helps in fruit ripening-

- (1) Auxin                      (2) Gibberallin  
(3) Cytokinin                      (4) Ethylene

**Answer (4)**

**Sol.** Phytohormone that helps in fruit ripening is ethylene the only gaseous hormone in plants that is both promoter and growth inhibitor

141. The sixteen Mahajanpadas are mentioned in-

- (1) Mahabharat (2) Ramayana  
(3) Anguttar Nikaya (4) Lalit Vistar

**Answer (3)**

**Sol.** Anguttar Nikaya (Buddhist literature)

142. Who was the first muslim President of Indian National Congress-

- (1) Abul Kalam Azad (2) Shaukat Ali  
(3) Mohammad Ali Jinna (4) Badruddin Tyabji

**Answer (4)**

**Sol.** Badruddin Tayabji

143. The author of 'Hind Swaraj' was-

- (1) B. G. Tilak  
(2) Mahatma Gandhi  
(3) Bankim Chandra Chatterji  
(4) Subhas Chandra Bose

**Answer (2)**

**Sol.** (Hind Swaraj) Mahatma Gandhi

144. Father of history is called-

- (1) Dymekus (2) Talmy  
(3) Herodotus (4) None of the above

**Answer (3)**

**Sol.** Herodotus

145. Ashtadhyayi is composed by-

- (1) Patanjali (2) Panini  
(3) Kalhar (4) Kalidas

**Answer (2)**

**Sol.** Panini

146. Satyamav Jayate is taken from-

- (1) Vedas (2) Mundkohanishad  
(3) Aranyak (4) Smrities

**Answer (2)**

**Sol.** Mundkohanishad

147. Old name of Mahabharat is-

- (1) Vijay Samhita (2) Parajay Samhita  
(3) Jay Samhita (4) None of the above

**Answer (3)**

**Sol.** Jay Samhita

148. The capital of Vatsamahajanpad was-

- (1) Champa (2) Ujjain  
(3) Kaushambi (4) Patliputra

**Answer (3)**

**Sol.** Kaushambi

149. Red Planet is called-

- (1) Mercury (2) Mars  
(3) Venus (4) Jupiter

**Answer (2)**

**Sol.** Mars

150. Which state has largest coastal line-

- (1) Maharashtra (2) Tamilnadu  
(3) Kerla (4) Gujrat

**Answer (4)**

**Sol.** Gujrat

151. Inkalab Jindabad slogan given by-

- (1) Jawahar Lal Nehru  
(2) Mahatma Gandhi  
(3) Sardar Bhagat Singh  
(4) Subhash Chandra Bose

**Answer (3)**

**Sol.** Sardar Bhagat Singh

152. In which year planing commission transform in NITI Commission-

- (1) 2014 A.D. (2) 2015 A.D.  
(3) 2013 A.D. (4) 2016 A.D.

**Answer (2)**

**Sol.** 2015 A.D.

153. National Song is taken by-

- (1) Geetanjali (2) Anandmath  
(3) Kamayani (4) None of the above

**Answer (2)**

**Sol.** Anandmath

154. National farmer commission established on-

- (1) 2004 A.D (2) 2006 A.D  
(3) 2001 A.D (4) 2008 A.D

**Answer (1)**

**Sol.** (2004) 18 November

155. State flower of Uttar Pradesh is-

- (1) Bramh Kamal (2) Palash  
(3) Rose (4) Burans

**Answer (2)**

**Sol.** Palash (Butea Monosperma)

156. Siraj of east is called-

- (1) Varanasi (2) Gorakhpur  
(3) Baliya (4) Jaunpur

**Answer (4)**

**Sol.** Jaunpur

157. National Youth day associated with-

- (1) Rajiv Gandhi                      (2) Swami Vivekanand  
(3) Dara Singh                         (4) Devanand

**Answer (2)**

**Sol.** Swami Vivekanand

158. Green revolution associated with-

- (1) Dr. Verghese Kurien  
(2) Dr. M. S. Swaminathan  
(3) Dr. Salim Ali  
(4) Dr. Yashpal

**Answer (2)**

**Sol.** Dr. M. S. Swaminathan

159. Fibre of gold is called-

- (1) Silk                                      (2) Jute  
(3) Cotton                                 (4) None of the above

**Answer (2)**

**Sol.** Jute

160. Smallest National highway is-

- (1) N.H-7                                    (2) N.H-47A  
(3) N.H-76                                 (4) N.H-30

**Answer (2)**

**Sol.** N.H-47A

161. Dudhawa National Park is situated at-

- (1) Uttrakhand                            (2) Bihar  
(3) Jharkhand                             (4) Uttar Pradesh

**Answer (4)**

**Sol.** Uttar Pradesh

162. Total number of Rajya Sabha members is-

- (1) 245                                        (2) 230  
(3) 260                                        (4) 255

**Answer (1)**

**Sol.** 245 (present)

163. Which Highcourt has highest number of Judges-

- (1) Allahabad                              (2) Jabalpur  
(3) Patna                                     (4) Kolkata

**Answer (1)**

**Sol.** Allahabad (160)

164. How many state has legislative council-

- (1) 5    (2) 6  
(3) 7    (4) 4

**Answer (3)**

**Sol.** 7

165. Annapurana scheme when started-

- (1) 2002 A.D                                (2) 2000 A.D  
(3) 2003 A.D                                (4) 1998 A.D

**Answer (2)**

**Sol.** 2000 A.D

166. Article-356 associated with-

- (1) National Emergency  
(2) Financial Emergency  
(3) State Emergency  
(4) International Emergency

**Answer (3)**

**Sol.** State Emergency

167. Chilka lake is situated in-

- (1) Uttar Pradesh                         (2) Karnatka  
(3) Tamilnadu                              (4) Oddisa

**Answer (4)**

**Sol.** Odisha

168. Domodar is a tributary river-

- (1) Ganga                                     (2) Hugli  
(3) Yamuna                                 (4) Suravan Rekha

**Answer (2)**

**Sol.** Hugli

169. Titan is the largest moon or satellite of-

- (1) Mars                                        (2) Venus  
(3) Jupiter                                    (4) Saturn

**Answer (4)**

**Sol.** Saturn

170. The richest bio-diversity is found in-

- (1) Kashmir Vally                         (2) Silant Vally  
(3) Surma Vally                             (4) Vally of flowers

**Answer (2)**

**Sol.** Silant Vally

171. International ozone day is celebrated on-

- (1) 16th September                        (2) 7th December  
(3) 21st March                                (4) 22nd April

**Answer (1)**

**Sol.** 16th September

172. When the wild life protection Act was passed-

- (1) 1965                                        (2) 1970  
(3) 1972                                        (4) 1977

**Answer (3)**

**Sol.** 1972

173. The coast areas of which of the following oceans are called ring of fire–

- (1) Atlantic Ocean      (2) Pacific Ocean  
(3) Indian Ocean      (4) None of the above

**Answer (2)**

**Sol.** Pacific Ocean

174. As per 2011 census the densely populated state of India is–

- (1) Arunachal Pradesh      (2) Sikkim  
(3) Mizoram      (4) Bihar

**Answer (4, 1)**

**Sol.** Bihar as per english translation

Arunachal Pradesh as per hindi translation

175. Which state grow more soyabeen–

- (1) Kerala      (2) Maharashtra  
(3) Madhya Pradesh      (4) Punjab

**Answer (3)**

**Sol.** Madhya Pradesh

176. Green revolution mainly associated with–

- (1) Millets Production  
(2) Pulse Production  
(3) Wheat Production  
(4) Oil seed (Tilhan) Production

**Answer (3)**

**Sol.** Wheat Production

177. The President of India can nominate–

- (1) 10 members to Rajya Sabha  
(2) 02 members to Rajya Sabha  
(3) 15 members to Rajya Sabha  
(4) 12 members to Rajya Sabha

**Answer (4)**

**Sol.** 12 members to Rajya Sabha

178. The 52<sup>nd</sup> amendment to the constitution of India deals with–

- (1) Reservation  
(2) Defection  
(3) Election  
(4) Protection of Minorities

**Answer (2)**

**Sol.** Defection

179. Who among the following believed in Blood and Iron policy–

- (1) Aibak      (2) Balban  
(3) Razia      (4) Iltutmish

**Answer (2)**

**Sol.** Balban

180. The department of public work was established for the first time by–

- (1) Alauddin Khalji      (2) Balban  
(3) Firozshah Tughlag      (4) Iltutmish

**Answer (3)**

**Sol.** Firozshah Tughlag

181. Find the zeroes of the polynomial  $2x^3+5x^2-9x-18$  if it is given that the product of its two zeroes is 3–

- (1)  $2, \frac{-3}{2}$       (2)  $1, \frac{1}{3}$   
(3) 3, -1      (4)  $3, \frac{-1}{3}$

**Answer (delete)** Incorrect data

182. If  $x=a, y=b$  is the solution of the equation  $x-y=2$  and  $x+y=4$ , then the values of a and b respectively–

- (1) 3 and 5  
(2) 3 and -4  
(3) 5 and 3  
(4) -3 and -1

**Answer (delete)**

**No correct option according to question in english.**

**Sol.** Given  $x=a, y=b$

Consider  $x-y=2$  as eq(i) and  $x+y=4$  as eq(ii)

By adding eq(i) and eq(ii), we get:

$$2x=6 \Rightarrow x=3$$

Now, from eq(i)

$$x-y=2 \Rightarrow 3-y=2 \Rightarrow y=3-2=1$$

Clearly  $a=x$  &  $b=y$ , so  $a=3$  &  $b=1$

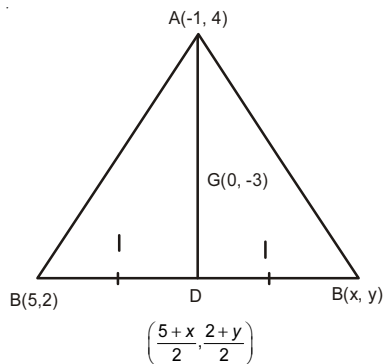
183. Two vertices of a triangle are (-1,4) and (5,2) if the centroid (0,-3), find the third vertex–

- (1) (1,4)  
(2) (4,15)  
(3) (-1,-4)  
(4) (-4,-15)

**Answer (4)**



Sol.

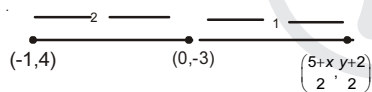


Let the co-ordinates of 3rd vertex be (x,y). Here G is centroid, whose co-ordinates are (0,-3)

We know that AGD is the median as G is centroid. So by section formula, co-ordinates of D are

$$\Rightarrow D\left(\frac{5+x}{2}, \frac{2+y}{2}\right)$$

Now in AGD, applying section formula because AG:GD=2:1



$$\text{So, } 0 = \frac{2\left(\frac{5+x}{2}\right) + 1(-1)}{2+1} \Rightarrow 0 = 5+x-1 \Rightarrow x = -4$$

$$\text{and } -3 = \frac{2\left(\frac{y+2}{2}\right) + 4}{2+1} \Rightarrow -3 = y+2+4 \Rightarrow y = -15$$

Hence, co-ordinates of third vertex is (-4,-15)

184. If  $\tan\theta + \sin\theta = m$  and  $\tan\theta - \sin\theta = n$ , then find the value of  $m^2 - n^2$ .

- (1)  $4\sqrt{mn}$  (2)  $4mn$   
(3)  $2\sqrt{m.n}$  (4)  $\sqrt{m.n}$

Answer (1)

Sol.  $\tan\theta + \sin\theta = m$  and  $\tan\theta - \sin\theta = n$

$$\text{so, } m^2 = \tan^2\theta + \sin^2\theta + 2\tan\theta\sin\theta$$

$$n^2 = \tan^2\theta + \sin^2\theta - 2\tan\theta\sin\theta$$

$$\therefore m^2 - n^2 = 4\tan\theta\sin\theta \text{ (IV)}$$

Now multiply both equations

$$\Rightarrow (\tan\theta + \sin\theta)(\tan\theta - \sin\theta) = mn$$

$$\Rightarrow \tan^2\theta - \sin^2\theta = mn$$

$$\Rightarrow \frac{\sin^2\theta}{\cos^2\theta} - \sin^2\theta = mn$$

$$\Rightarrow \sin^2\theta \tan^2\theta = mn$$

$$\text{so, } \sin\theta \tan\theta = \sqrt{mn} \text{ (iii)}$$

By subtracting eq(iii) in eq(iv) we get,

$$m^2 - n^2 = 4\sqrt{mn}$$

185. Mean of 35 observation is 75. The mean of first 18 observation is 70 and the mean of last 18 observation is 80 find the 18th observation-

- (1) 80 (2) 70  
(3) 68 (4) 75

Answer (4)

Sol. Mean of 35 observations is 75.

Let the observations  $x_1, x_2, x_3, \dots, x_{35}$

$$\text{So, } \frac{x_1 + x_2 + \dots + x_{35}}{35} = 75$$

$$\Rightarrow x_1 + x_2 + \dots + x_{35} = 2625 \text{ (i)}$$

Now, the mean of 1st 18 observations is 70.

$$\text{So, } \frac{x_1 + x_2 + \dots + x_{18}}{18} = 70 \text{ (ii)}$$

Last 18 observations are  $x_{18}, x_{19}, x_{20}, \dots, x_{35}$

So, their mean will be,

$$\frac{x_{18} + x_{19} + x_{20} + \dots + x_{35}}{18} = 80 \text{ (iii)}$$

Adding eq(ii) & eq(iii), we get

$$\Rightarrow \frac{x_1 + x_2 + x_3 + \dots + 2x_{18} + x_{19} + \dots + x_{35}}{18} = 150$$

$$\Rightarrow \frac{x_1 + x_2 + x_3 + \dots + x_{35} + x_{18}}{18} = 150$$

$$[\therefore x_1 + x_2 + \dots + x_{35} = 2625]$$

$$\Rightarrow 2625 + x_{18} = 2700 \Rightarrow x_{18} = 75$$

186. If  $x = \frac{1}{3-2\sqrt{2}}$  and  $y = \frac{1}{3+2\sqrt{2}}$  then find the value

of x+y

- (1) 3 (2) 0  
(3) 6 (4) 1

Answer (3)

$$\text{Sol. } x = \frac{1}{3-2\sqrt{2}} = \frac{3+2\sqrt{2}}{(3+2\sqrt{2})(3-2\sqrt{2})}$$

$$= \frac{3+2\sqrt{2}}{9-8} = 3+2\sqrt{2}$$

$$y = \frac{1}{3+2\sqrt{2}} = \frac{3-2\sqrt{2}}{(3+2\sqrt{2})(3-2\sqrt{2})} = 3-2\sqrt{2}$$

So,  $x+y=6$

187. The edges of a plane surface are-

- (1) Lines (2) Points  
(3) Angles (4) Planes

**Answer (1)**

**Sol.** Edges of plane surface are Lines

188. If each exterior angle of a regular polygon is  $18^\circ$ , find the number of sides of the polygon-

- (1) 10 (2) 15  
(3) 20 (4) 8

**Answer (3)**

**Sol.** The sum of all exterior angles of a polygon is  $360^\circ$ .

Let no. of Sides be  $n$ .

$$\therefore 18 \times n = 360^\circ \Rightarrow n = \frac{360^\circ}{18} = 20$$

189. Find mean of  $x+1, x+3, x+4, x+8$  is-

- (1)  $(x+1)$  (2)  $(x+3)$   
(3)  $(x+4)$  (4)  $(x+8)$

**Answer (3)**

**Sol.** Given- $x+1, x+3, x+4, x+8$

Now, mean will be:

$$\frac{x+1+x+3+x+4+x+8}{4} = (x+4)$$

190. The distance of the point  $P(-6,8)$  from the origin is-

- (1) 8 (2) 10  
(3)  $2\sqrt{7}$  (4) 6

**Answer (2)**

**Sol.** By distance formula the distance b/w points  $(0,0)$  &  $(-6,8)$  is

$$\Rightarrow \sqrt{(0+6)^2 + (0-8)^2} \Rightarrow \sqrt{36+64} \Rightarrow \sqrt{100} = 10 \text{ cm}$$

191. The ratio of incomes of two person A and B is 9:4 and the ratio of their expenditure is 3:1. If each of them manages to save Rs1000, then the income of B is-

- (1) Rs.3000 (2) Rs.4000  
(3) Rs.9000 (4) Rs.2000

**Answer (Deleted) Incorrect options**

192. The sum of areas of two squares is  $468\text{cm}^2$ . If the sum of their perimeters is 120cm, then the difference of their side is-

- (1) 1.5 cm (2) 2 cm  
(3) 4 cm (4) 6 cm

**Answer (4)**

**Sol.** Let the sides of sq be  $x$  and  $y$  respectively

Given:  $x^2+y^2=468$  \_\_\_\_\_(i)

$4x+4y=120$  \_\_\_\_\_(ii)

$4x+4y=120$

$x+y=30$  \_\_\_\_\_(iii)

Sq both sides, we get in eq(iii), we get

$x^2+y^2+2xy=900$  \_\_\_\_\_(iv)

Substituting value of  $x^2+y^2$  from eq(i) to eq(4), we get

$x+y-2xy=468-432=36$

$\Rightarrow (x-y)^2=36 \Rightarrow x=6$

193. The areas of two similar triangles  $\triangle ABC$  and  $\triangle DEF$  are  $48\text{ cm}^2$  and  $12\text{ cm}^2$  respectively. If  $EF=3\text{ cm}$  then  $BC$  is-

- (1) 6 cm (2) 4 cm  
(3) 2 cm (4) 12 cm

**Answer (1)**

**Sol.** Insert Image

$\triangle ABC$  is similar to  $\triangle DEF$

We have:  $\frac{\text{ar } \triangle ABC}{\text{ar } \triangle DEF} = \left(\frac{BC}{EF}\right)^2$  Area Theorem

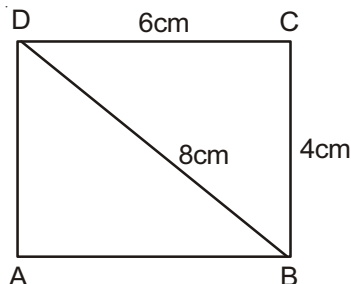
$\Rightarrow \frac{48\text{cm}}{12\text{cm}} = \left(\frac{BC}{3}\right)^2 \Rightarrow \frac{BC}{3} = 2 \Rightarrow BC = 6\text{cm}$

194. A Parallelogram has sides 6cm and 4cm and one of its diagonals is 8cm, then its area is-

- (1)  $36\text{ cm}^2$  (2)  $3\sqrt{15}\text{ cm}^2$   
(3)  $6\sqrt{15}\text{ cm}^2$  (4)  $12\sqrt{210}\text{ cm}^2$

**Answer (3)**

**Sol.**



Applying herons formula in  $\triangle DCB$

or  $\triangle DCB = \sqrt{9 \times 1 \times 5 \times 3} = 3\sqrt{15}$

Area of Parallelogram =  $2 \times 3\sqrt{15} = 6\sqrt{15}$

195. The radii of a right circular cone and a right circular cylinder are in the ratio 4:3 and their heights are in the ratio 2:3. The ratio of their volumes is-

- (1) 32:27                      (2) 32:9  
(3) 32:81                      (4) 27:32

**Answer (3)**

**Sol.** Let the radii of right circular cone be  $4x$

Let the radii of right circular cylinder be  $3x$

Let the radii of right circular cone be  $2y$

Let the radii of right circular cylinder be  $3y$

$$\text{Volume of cone} = \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi \times 4x \times 4x \times 2y$$

$$\text{Volume of cylinder} = \pi r^2 h = \pi \times 3x \times 3x \times 3y$$

$$\frac{\text{Volume of Cone}}{\text{Volume of Cylinder}} = \frac{\frac{1}{3} \times \pi \times 4x \times 4x \times 2y}{\pi \times 3x \times 3x \times 3y}$$

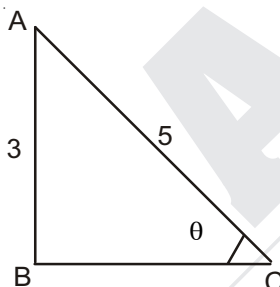
$$= \frac{16 \times 2}{81} = \frac{32}{81}$$

196. If  $\sin \theta = \frac{3}{5}$ , then the value of  $\sin 2\theta$  is -

- (1)  $\frac{6}{5}$                               (2)  $\frac{4}{5}$   
(3)  $\frac{12}{25}$                             (4)  $\frac{24}{25}$

**Answer (4)**

**Sol.**



$$\sin \theta = \frac{3}{5} = \frac{AB}{AC}$$

$$AB^2 + BC^2 = AC^2 \Rightarrow (3)^2 + (BC)^2 = (5)^2 \Rightarrow 9 + BC^2 = 25$$

$$\Rightarrow BC^2 = 16 \Rightarrow BC = 4$$

$$\cos \theta = \frac{BC}{AC} = \frac{4}{5}$$

$$\sin 2\theta = 2 \sin \theta \cos \theta = 2 \times \frac{3}{5} \times \frac{4}{5} = \frac{24}{25} = 4^{\text{th}} \text{ option}$$

197. If  $a$  and  $b$  are odd integers, then which of the following is an even integer-

- (1)  $ab$                               (2)  $2a+b$   
(3)  $ab+1$                             (4)  $a+2b$

**Answer (3)**

**Sol.** Let  $a=2k+1$  &  $b=2n+1$

- (1)  $ab = \text{odd} = (2k+1)(2n+1) = 4nk + 2(n+k) + 1$   
(2)  $2a+b = \text{odd} = (4k+2)(2n+1) = 8nk + 2$   
(3)  $ab+1 = \text{even}$   
(4)  $a+2b = \text{odd}$

198. The sum of  $0.\bar{6}$  and  $0.\bar{7}$  is -

- (1)  $1.\bar{3}$                               (2) 1.3  
(3)  $1.\bar{4}$                               (4) an irrational number

**Answer (3)**

**Sol.** Let  $0.\bar{6} = x$  &  $0.\bar{7} = y$

$$x = 0.666 \dots \quad (1)$$

$$10x = 6.666 \dots \quad (2)$$

Subtracting (1) from (2), we get

$$9x = 6 \Rightarrow x = \frac{2}{3}$$

$$y = 0.777 \dots \quad (3)$$

$$10y = 7.777 \dots \quad (4)$$

Subtracting (3) from (4)

$$9y = 7 \Rightarrow y = \frac{7}{9}$$

$$x + y = \frac{2}{3} + \frac{7}{9} = \frac{6+7}{9} = \frac{13}{9} = 1.\bar{4} \quad (3)$$

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

- (1)  $2\sqrt{3}$                               (2)  $\sqrt{3}(\sqrt{3}-1)$   
(3)  $3\sqrt{3}$                               (4) 0

**Answer (4)**

$$\text{Sol. } \left(x^3 + \frac{1}{x^3}\right) = \left(x + \frac{1}{x}\right)^3 - 3\left(x + \frac{1}{x}\right) = 0$$

200. If  $5^{x+1} + 5^{2-x} = 126$ , then  $x$  is equal to-

- (1) -2, -1                              (2) 1, 2  
(3) -1, 3                              (4) 2, -1

**Answer (4)**

$$\text{Sol. } 5^{x+1} + 5^{2-x} = 126 = 125 + 1 = 5^3 + 5^0$$

$$\text{either } x+1=3 \text{ or } 2-x=3$$

$$2-x=0 \text{ or } x+1=0$$

$$x=2 \text{ or } x=-1$$