NTSE STAGE II (2016-17)
CODE: 13 – 15
MAT
Held on: May 14, 2017

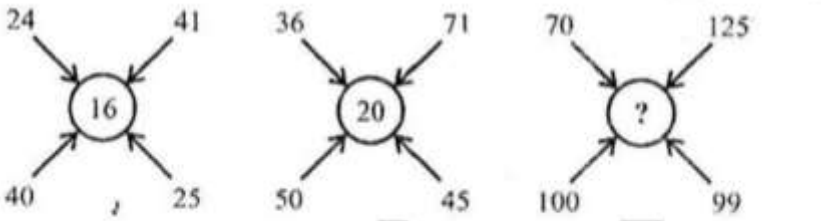
1. Some translated words in an artificial Language (in which the word order is not necessarily same) are given below

mie pie sie	good person sing
pie sie rie	sing good lyrics
tie rie sie	love good lyrics

(1) pie tie rie
(2) tie rie sie
(3) rie mie tie
(4) sie mie pie

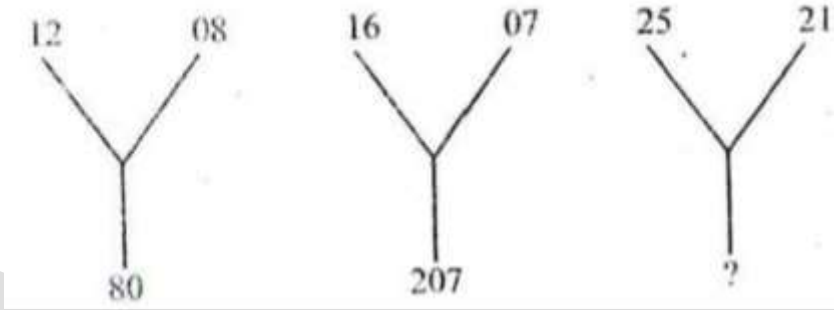
2. In the given sequence, some letters are missing. Which of the given options can fill the blanks in the correct order from left to right?
ab _ ab _ aaa _ bbaaa _ bbbb
(1) abab
(2) abba
(3) aabb
(4) baba

3. Identify the number in the position of '?'



(1) 24
(2) 28
(3) 32
(4) 36

4. Find the missing number



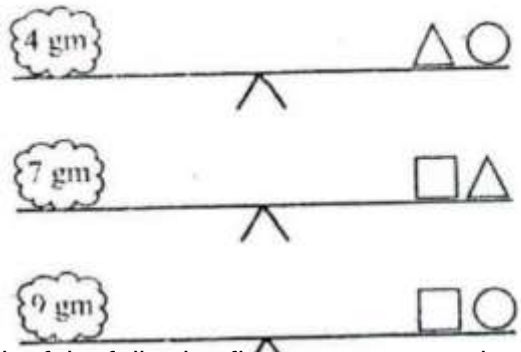
(1) 184
(2) 210
(3) 241
(4) 425

5. If A, B, C, D are distinct decimal digits, then which of the following option is correct?

$$\begin{array}{r} A4BC \\ \times\ C \\ \hline 1A1DC \end{array}$$

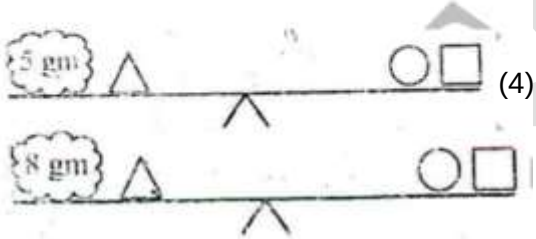
(1)A=3,B=7,C=5,D=9 (2)A=2,B=3,C=6,D=5
(3)A=3,B=8,C=6,D=5 (4)A=2,B=3,C=5,D=7

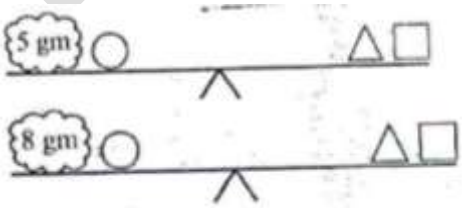
6. Observe the following figures representing a balance



Which of the following figures represents the correct balance?

(1) (2)

(3) 

(4) 

7. Choose appropriate option from given alternatives such that the relationship defined by ':' is preserved.\
PNLJ : LIFC and VTRP: ___
(1) ROLI (2) SOLH
(3) RPOM (4) DMEN

8. A coin is in a fixed position. Another identical coin is rolled around the edge of the first one. How many complete revolutions will be made by the revolving coin before it reaches its starting position?

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

9. If South East becomes North; and North East becomes West; then West becomes
(1) North East (2) South East
(3) North West (4) South West

10. A cube is 6cm in length, breadth and height. It is painted red on two opposite faces, black on the other two opposite faces and green on the left over faces. It is then cut into 216 cubes of side 1cm. How many small cubes have no face painted?

(1) 16 (2) 8
(3) 64 (4) 24

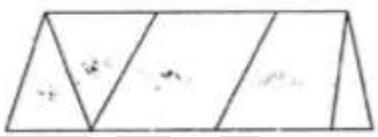
11. Find the odd one out of the following terms:
EF22, JK42, GH24, VW90, IJ38

(1) EF22 (2) GH24
(3) IJ38 (4) VW90

12. Choose the conclusions which logically follow from the given statements: Statement:
All the pens are papers.
All the papers are boats.
Some birds are boats.
Conclusions:
A. Some boats are pens.
B. Some birds are papers.
C. None of the pens are birds

(1) Only A and B (2) Only A
(3) Only C (4) Only A and C

13. How many quadrilaterals are there in the given figure?



(1) 10 (2) 11
(3) 12 (4) 13

14. Which of the following alternatives will fit in place of 'M'? 255, 3610, 4915, M, 8125

(1) 5100 (2) 5420
(3) 6420 (4) 6422

15. Which of the following alternatives will fit in place of 'M'?
L6, O8, R11, M, X25, A42, D75

(1) U15 (2) U16
(3) W14 (4) U14

16. Which of the following alternatives will fit in place of 'M'?

7	3	6	2
2	8	5	4
1	1	2	4
4	2	1	M

(1) 6 (2) 5

(3) 4 (4) 3

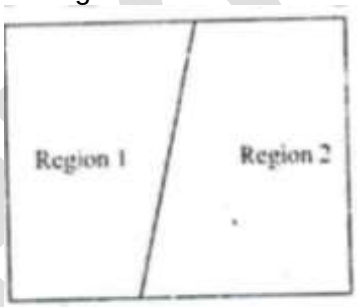
17. If ‘ ’ means ‘x’, ‘ ’ means ‘ ’, ‘ ’ means ‘+’ and ‘ ’ means ‘–’, then evaluate the following expression using standard operator precedence.
56(68) 4 1
(1) 52 (2) 24
(3) 15 (4) 43

18. With what operators, should the symbol @ and < be replaced so that the following expression is valid
100–81 27@3<6=115
(1) + and – (2) x and
(3) + and x (4) and –

19. x is an integer such that it leaves a remainder of 2 when divided by 3, leaves a remainder of 3 when divided by 5, and leaves a remainder of 5 when divided by 7. What could be a possible value of x from among the following options?
(1) 53 (2) 68
(3) 74 (4) 83

20. In how many ways can you distribute 10 identical balls into two non identical boxes so that none are empty?
(1) 2 (2) 8
(3) 9 (4) 10

21. One line forms two regions in a plane. Similarly, two lines in a plane can from a maximum of four regions. These are shown in the figures below:



What is the maximum number of regions that can be formed by 4 lines in a plane? Lines need not be concurrent.
(1) 7 (2) 8
(3) 10 (4) 11

22. You need to take n arbitary points on or inside a square of side 2cm such that there will always be a pair of points at a distance of not more than $\sqrt{2}$ cm. What is the minimum value of n?
(1) 2 (2) 4
(3) 5 (4) 8

23. The following facts are known about an unknown number X:
I. The sum of digits of X is 15
II. The unit’s digit of X is 6.
Then which of the following statements is certainly true about X?

(1) X is divisible by 3 but not by 6 (2) X is divisible by 6 but not by 9
(3) X is not divisible by 6 but divisible by 9 (4) X is divisible by both 6 and 9

24. The average age of A, B and C is 43 years. Which of the following statements are required to find the eldest among them?
Statement:
I. Age of C is 65 years.
II. Age of A is 25 years.

(1) I is sufficient
(2) Both I and II are required
(3) I and II together are not sufficient
(4) II is sufficient

Directions (Questions 25 – 26): A class is to be taught five subjects – Hindi, Physics, Chemistry, Biology and Mathematics by five different teachers – A, B, C, D and E in five periods (1 to 5). A teacher can teach in only one of the periods. The following details are available about the teaching.

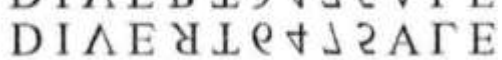
A teaches mathematics which is not taught in the first period.
Physics is taught by D in an even numbered period.
Chemistry is taught in an odd period, and it precedes mathematics period.
E teaches in the first period.
C teaches Chemistry but not in the first or the last period.
Hindi is taught in the last period,

25. Which of the following statements is necessarily true?
(1) Third period is of Hindi taught by B
(2) Second period is of Physics taught by C
(3) Fourth period is of Mathematics taught by A
(4) Fifth period is of Biology taught by D

26. Which subject is taught by B?
(1) Physics
(2) Chemistry
(3) Biology
(4) Hindi

27. A solid metallic cylinder or radius 12cm and height 175cm is melted and moulded into another solid cylinder of height 63cm. What is the radius of the new cylinder?
(1) 14
(2) 4
(3) 20
(4) 5

28. Choose the option which shows the correct mirror image of the characters given below.

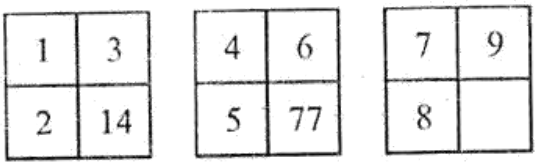
(1) 
(2) 
(3) 
(4) 

Directions Questions 29 – 30): There are 150 students in a class. 20 students play both hockey and kabaddi. The same numbers of students play only football. 35 students play both hockey and football but not kabaddi. 25 play both football and kabaddi but not hockey. The number of students who play only hockey is the same as the number of students who do not play any of the three mentioned games and the number of students who play only hockey is half of the number of students who play only football.

29. How many students play only kabaddi?
(1) 10
(2) 20
(3) 30
(4) 40

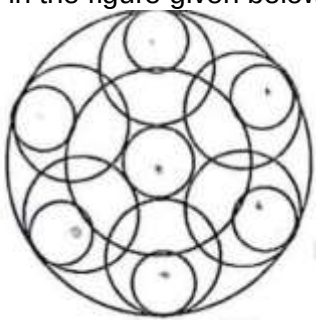
30. How many students play only hockey?
(1) 10
(2) 15
(3) 20
(4) 25

31. What will be the number in the blank box?



(1) 98 (2) 128
(3) 189 (4) 194

32. What is the total number of circles in the figure given below?

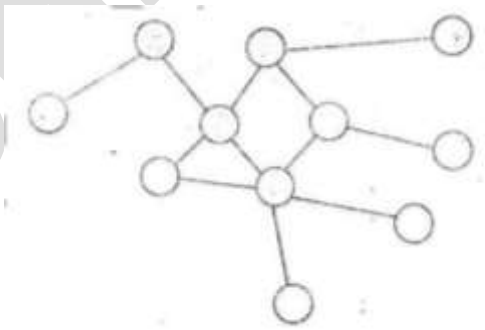


(1) 13 (2) 14
(3) 15 (4) 16

33. A bucket contains milk mixed with water, of which 3 parts are water and 5 parts are milk. A part of the mixture is removed from the bucket and is replaced by water. What portion of the mixture should have been removed so that the new mix contains milk and water in equal proportion?

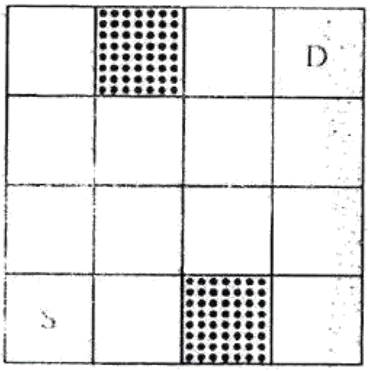
(1) 1/3 (2) 1/4
(3) 1/5 (4) 1/6

34. You need to colour the circles in such a way that no two circles connected by a line get the same colour. What is the minimum number of distinct colours needed to colour all the circles in the figures?



(1) 4 (2) 5
(3) 6 (4) 7

35. From the each box you can move only to the immediate right box or the immediate top box. You cannot move into or through a shaded box. How many ways are there to move from the box marked S to the box marked D?



(1) 8 (2) 10
(3) 12 (4) 14

36. Which number will come in the place of 'M'?

16	7	2	20
25	8	2	30
36	9	5	24
49	10	7	M

(1) 21 (2) 32
(3) 40 (4) 63

37. The square of the length of a rod AB is 72 cm^2. If we place the rod in the corner of a room, so that the end A is always on the edge between the two walls of the corner and the end B is always on the floor, what is the maximum possible area of the triangle formed by the rod, the edge between the walls and the floor?
(1) 6 cm^2 (2) 12 cm^2
(3) 18 cm^2 (4) 24 cm^2

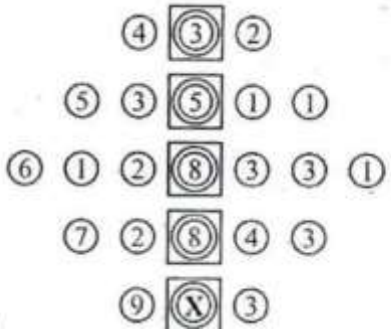
38. What is the missing term (?) in the following series?
2, 6, 6, 5, 10, 4, 14, 3, 18, ?
(1) 1 (2) 2
(3) 19 (4) 22

39. In the question given below, there are two statements followed by two conclusions. You have to take the given statements to be true even if they seem to be a variance from commonly known facts. Read all the conclusions, and then decide which of the given conclusions logically follows from the given statements?
Statements:
Some kings are queens.
All the queens are beautiful.
Conclusions:
I. All the kings are beautiful.
II. All the queens are kings.
(1) Only I follows (2) Only II follows
(3) Neither I nor II follows (4) Both I and II follow

40. If prime numbers are assigned to English alphabets from A to Z in order, MAT will be
(1) 31 1 67 (2) 41 1 67

(3) 37 2 71 (4) 41 2 71

41. What number comes inside the square in place of 'X'?



(1) 5 (2) 6
(3) 7 (4) 8

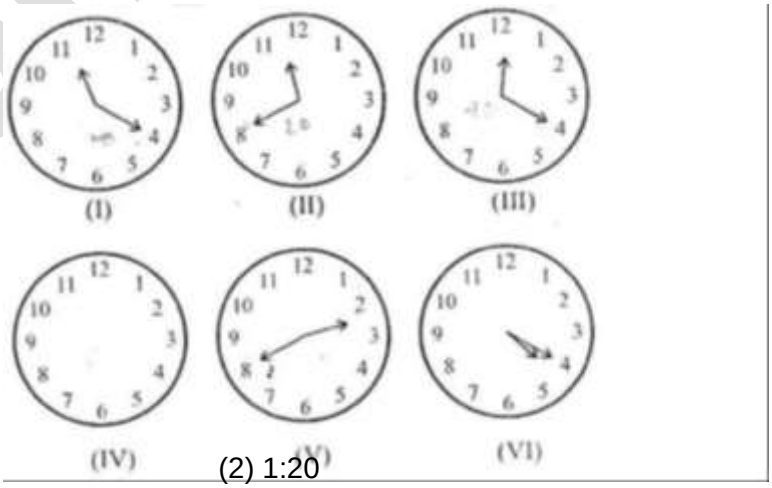
42. Find the alphabet that will replace '?'

I	2	2	3	1	5
II	3	4	2	4	2
III	H	P	I	?	Y

(1) A (2) D
(3) O (4) N

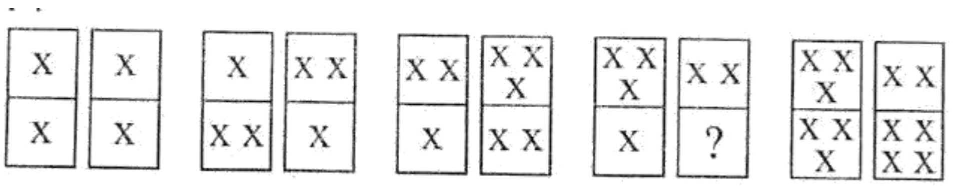
43. In a certain language IMPHAL is coded as JLRFDI. How will MYSURU be coded in the same language?
(1) NXUSUR (2) RUSUXN
(3) NXSUUR (4) NXTTUR

44. What time should the IV clock shows?



(1) 1:00 (2) 1:20
(3) 1:40 (4) 2:00

45. How many crosses should be there in the box marked with '?'.



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

46. Find the missing term. a, b, d, ___, p
(1) h (2) i
(3) j (4) k

47. A is East of B and West of C, D is South West of C, and B is South East of E. When see from West to East, which of the following sequences are possible?
I. EBDAC
II. DEBAC
III. EBADC
IV. EDBAC

(1) I and III (2) I, III and IV
(3) I, II and III (4) all I, II, III and IV

48. A, B, C and D are to be seated in a row. C and D cannot be on adjacent seat. Also, B cannot be at the third place. Which of the following must be false?
(1) A is at the fourth place (2) A is at the third place
(3) A is at the second place (4) A is at the first place

49. Mrs. Kirandeep, a driving instructor, has to arrange training schedule for some of her pupils. She has 8 new pupil who wish to book either a morning or evening of a particular day. The appointment can be given for Tuesday, Wednesday, Friday and Saturday. The instructor instructs only one pupil in morning and one in the evening session.
Mrs. Sabita is only available Tuesday morning but Mr Aaditya can make any time on a Wednesday.
Mrs Firdaus is free on Tuesday all day but Mr Naved is only free Wednesday evening. Mrs Seema is only available Friday morning whereas Mrs Ritu can only make Saturday evening.
Mrs Shalu is available all day Fridays whereas Mr. Ronald can make any time on a Saturday

Which of the following two should have morning appointments?

(1) Mr Ronald and Mrs Shalu (2) Mr Ronald and Mrs Firdaus
(3) Mr Aaditya and Mrs Firdaus (4) Mr Aaditya and Mr Ronald

50. Just before sunset Veena and Zeba were talking to each other standing face to face. If Veena see Zeba's shadow to be exactly towards the right of Zeba, which direction was Veena facing?
(1) South (2) North
(3) East (4) North East