



Roll Number

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# STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

## STATE LEVEL NATIONAL TALENT SEARCH EXAMINATION – 2016

### Class – X

### Part – II

### MENTAL ABILITY TEST (MAT) AND LANGUAGE TEST

Time : 90 Minutes

Maximum Marks : 100

#### INSTRUCTIONS TO CANDIDATES :

Read the following instructions before you answer the questions. Answers are to be given in a SEPARATE OMR ANSWER SHEET provided inside this booklet. Break the seal and start answering the questions once asked to do so.

1. Please write your Roll Number very clearly (only one digit in one block) as given in your Admission Card.
2. You have to answer 100 questions in this test.
3. This test has two Parts namely Mental Ability Test (MAT) and Language Test. You have to answer 50 MAT questions. In the Language Test you have to attempt only one language. That is either Malayalam (51 to 100 questions) or English (101 to 150 questions).
4. Select the most suitable answer for each question and completely darken the circle corresponding to the correct alternative as shown below.

Correct Method



Wrong Method



5. All questions carry ONE MARK each.
6. There is no negative mark. Every correct answer will be awarded one mark.
7. Do not write your name on any part of the question booklet or the answer sheet.
8. Rough Work can be done in the space provided at the end of this booklet.

#### പരീക്ഷാർത്ഥികൾക്കുള്ള നിർദ്ദേശങ്ങൾ :

ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാൻ തുടങ്ങുന്നതിന് മുമ്പ് താഴെ കൊടുത്തിരിക്കുന്ന നിർദ്ദേശങ്ങൾ സൂക്ഷ്മമായി വായിക്കുക. ഉത്തരം നൽകേണ്ടത് ഒരു പ്രത്യേക OMR ഉത്തരക്കടലാസിൽ ആണ്. നിർദ്ദേശത്തിനു ശേഷം മാത്രമേ സീൽ തുറക്കുവാനും, ഉത്തരം എഴുതുവാനും പാടുള്ളൂ.

1. നിങ്ങളുടെ റോൾ നമ്പർ (ഒരു കള്ളിയിൽ ഒരു അക്കം മാത്രം) വ്യക്തമായി നിങ്ങളുടെ പ്രവേശന പത്രത്തിൽ തന്നിരിക്കുന്നതു പോലെ എഴുതുക.
2. 100 ചോദ്യങ്ങൾക്ക് ഉത്തരമെഴുതിയാൽ മതി.
3. ഈ ടെസ്റ്റിന് രണ്ട് പാർട്ടുകൾ ഉണ്ട്. മെന്റൽ എബിലിറ്റി ടെസ്റ്റ് (MAT) ഉം ഭാഷാടെസ്റ്റും. MATന്റെ 50 ചോദ്യങ്ങൾക്കും ഉത്തരം എഴുതണം. എന്നാൽ ഭാഷാ ടെസ്റ്റിലെ ചോദ്യങ്ങളിൽ ഒന്നുകിൽ മലയാളം (51-100 വരെയോ) അല്ലെങ്കിൽ ഇംഗ്ലീഷ് (101-150 വരെയോ) മാത്രം ഉത്തരം എഴുതിയാൽ മതി.
4. ഓരോ ചോദ്യത്തിനും ഉചിതമായ ഉത്തരം തിരഞ്ഞെടുത്ത് ശരിയായ ഉത്തരത്തെ സൂചിപ്പിക്കുന്ന വൃത്തം മാത്രം താഴെ കൊടുത്തിരിക്കുന്ന പ്രകാരം പൂർണ്ണമായി കറുപ്പിക്കുക.

ശരിയായ രീതി



തെറ്റായ രീതി



5. എല്ലാ ചോദ്യങ്ങൾക്കും ഒരു മാർക്ക് വീതം.
6. ന്യൂന മാർക്ക് ഇല്ല. ഓരോ ശരി ഉത്തരത്തിനും ഒരു മാർക്ക് വീതം ലഭിക്കും.
7. നിങ്ങളുടെ പേര് ചോദ്യ പുസ്തകത്തിന്റെയോ ഉത്തരക്കടലാസിന്റെയോ ഒരു ഭാഗത്തും എഴുതൂ വാൻ പാടില്ല.
8. റഫ് വർക്കിനുവേണ്ടി ഈ ബുക്ക്ലെറ്റിന്റെ അവസാന ഭാഗം ഉപയോഗിക്കാവുന്നതാണ്.

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**State Level National Talent Search Examination – 2016**  
**Mental Ability Test**

1. ab - cc - abb - cc - bbc - c  
 (1) abcca (2) bccba (3) bcaba (4) bccac

**Answer (4)**

**Solution**

ab - cc - abb - cc - bbc - c  
       b  c      c   a   c

2. - xyx - xxy - xxx - xxy - y  
 (1) xyxyx (2) xxyyy (3) xxyxy (4) yyyyx

**Answer (3)**

**Solution**

- xyx - xxy - xxx - xxy - y  
 x   x      y   x   y

3. M - MN - MNMN - NNN - MNN  
 (1) NNMN (2) MMNN (3) NNNN (4) MNMN

**Answer (1)**

**Solution**

M - MN - MNMN - MNMN - MNMN

4. Ecology is related to environment in the same way as Histology is related to  
 (1) Hormones (2) Tissues (3) Bones (4) Histology

**Answer (2)**

**Solution**

Histology y → study of tissues

**Questions 5- 6: Find the missing number in the given series**

5. 17, 33, 70, 131, 278?  
 (1) 581 (2) 531 (3) 541 (4) 575

**Answer (2)**

**Solution**

17, 33, 70, 131, 278

$$17 \rightarrow 17 \times 2 - 1^2 = 34 - 1 = 33$$

$$33 \rightarrow 33 \times 2 + 2^2 = 66 + 4 = 70$$

$$70 \rightarrow 70 \times 2 - 3^2 = 131$$

$$131 \rightarrow 131 \times 2 + 4^2 = 278 \therefore 2 \times 278 - 5^2 = 531$$

6. 5, 25, 61, 113, 181?  
 (1) 265 (2) 375 (3) 275 (4) 365

**Answer (1)**

**Solution**

5, 25, 61, 113, 181?

   V  V   V   V  
 20  36  52  16

$$\therefore 68 - 16 = 81$$

$$181 + 84 = 265$$

$$\therefore 265$$

**Questions 7 – 9**

7. If ROYAL is coded as 18, 4, 25, 1, 12. What is the code for LIVES?  
 (1) 12, 4, 23, 5, 8      (2) 12, 2, 19, 22, 1      (3) 12, 4, 1, 15, 22      (4) 12, 3, 22, 2, 19

**Answer (4)**

**Solution**

ROYAL → 18 4 25 1 12

Lt AEIOU → 123 45 (vowels)

∴ YEAR → 25 2 1 18

Vowels

R → 18 Lt A → 1 ∴ L → 12

O → 4 E → 2 I → 3

Y → 25 I → 3 V → 22

A → 1 O → 4 E → 2

L → 12 U → 5 S → 19

∴ 12, 3, 22, 2, 19

8. If DIVE is coded as 9, 19, 45, 11. What is the code for YEAR?  
 (1) 51, 11, 3, 37      (2) 25, 11, 5, 37      (3) 51, 11, 5, 36      (4) 25, 11, 3, 36

**Answer (1)**

**Solution**

D = 4 →  $2 \times 4 + 1 = 9$       ∴ Y = 25 →  $2 \times 25 + 1 = 51$

1 = 9 =  $2 \times 9 + 1 = 19$       E = 5 →  $2 \times 5 + 1 = 11$

V = 22 =  $2 \times 22 + 1 = 45$       A = 1 →  $2 \times 1 + 1 = 3$

E = 5 =  $2 \times 5 + 11 = 11$       R = 18 →  $2 \times 18 + 1 = 37$

51, 11, 3, 37

9. If POCKET is coded as JKWOUF, what is the code word for BEAUTY?  
 (1) XUYEFA      (2) YXZFGA      (3) YTZGVB      (4) UYXAFE

**Answer (1)**

**Solution**

POCKET → JKWOUF

BEAUTY = ?

ic P → 16 →  $26 - 16 = 10$  → J

∴ B → 2 →  $26 - 2 = 24$  → X

O → 15 →  $26 - 15 = 11$  → K

E → 5 →  $26 - 5 = 21$  → U

C → 3 →  $26 - 3 = 23$  → W

A → 1 →  $25 - 1 = 25$  → Y

K → 11 →  $26 - 11 = 15$  → O

T → 20 →  $26 - 20 = 6$  → R

T → 20 →  $26 - 20 = 6$  → F

y - 25 →  $26 - 25 = 1$  → A

10. In Vinod's bag, except six books all remaining books are English books and except six books all remaining books are Malayalam books. Then totally how many books are there in Vinod's bag?

(1) 9      (2) 10      (3) 15      (4) 12

**Answer (1)**

**Solution**

Lt Books are Mt, Mt, Mt, Eg, Eg, E, Mr, Mr, Mr. ∴ Total no of Books = 9

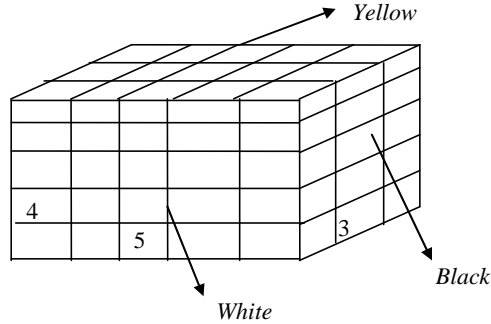
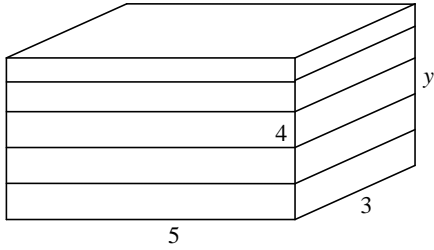
In there Except 6, Remaining are Maths

“ “ “ English

Malayalam

**Questions 11 – 14: Read the following information and answer the question 11 – 14 based on it**

- (i) The length, breadth and height of a rectangular piece of wood are 4 cm, 3 cm are 5 cm respectively
- (ii) Opposite sides of 5 cm x 4 cm are coloured in white
- (iii) Opposite sides of 4 cm x 3 cm are coloured in black
- (iv) Rest 5 cm x 3 cm are coloured in yellow in both sides
- (v) Now the places are cut in such a way that a cube 1 cm x 1 cm x 1cm will be made



11. How many cubes shall have only one colour?  
 (1) 20 (2) 22 (3) 18 (4) 16

**Answer (2)**

**Solution**

Cubes that have only our colour =  $12 + 4 + 6 = 22$

12. How many cubes have all the three colours?  
 (1) 10 (2) 12 (3) 8 (4) 6

**Answer (3)**

**Solution**

Cube that have three colour = 8

13. How many cubes shall not have any colour?  
 (1) 6 (2) 8 (3) 10 (4) 12

**Answer (1)**

**Solution**

Cube that have three on colour  $60 - (8 + 24 + 22) = 6$

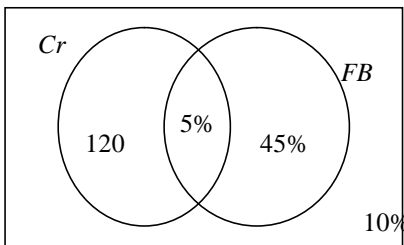
14. How many cubes shall have only two colours white and yellow in their tow sides?  
 (1) 10 (2) 14 (3) 16 (4) 12

**Answer (4)**

**Solution**

Cube that one white are yellow = 12

**Questions 15 – 17: In a region, it was observed that 120 people liked only cricket 45% of the people liked only football 5% of the people liked both cricket and football. 10% of the people liked neither cricket nor football**



ie  $100\% - (5\% + 45\% + 10\%) = 100\% - 60\% = 40\%$

40% of total = 120  
 Total = 300

15. How many people like exactly one game?  
 (1) 255 (2) 180 (3) 165 (4) 170

**Answer (1)**

**Solution**

Exactly are same =  $120 + 45\%$  of 300  
 $= 120 + 135$   
 $= 255$

16. How many people do not like any of the two games?  
 (1) 10 (2) 20 (3) 30 (4) 40

**Answer (3)**

**Solution**

Do not like any same = 10% of total  
 = 10% of 300  
 = 30

17. How many people like only football?  
 (1) 100 (2) 135 (3) 145 (4) 155

**Answer (2)**

**Solution**

Only foot ball = 45% =  $\frac{45}{100} \times 300 = 135$

**Questions 18 – 19: Given below is a series of letters, numbers and symbols. Study the series carefully and answer the questions**  $A\Delta\emptyset B3C8F\sqcup KW \# * 6N5 * \uparrow PA\Delta 7B45\sqcup Q6 \uparrow B\sqcup$

L = A, B, C, F, K, W, N, P, Q = 9

18. What is the ratio between the letters and numbers in the series? If a letter or number has been used more than once, it is to be counted as only

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

**Answer (4)**

**Solution**

Number = 3, 8, 6, 5, 7, 4 = 6

9: 6 = 3: 2

19. How many letters have symbols on their left as well as on their right?

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

**Answer (1)**

**Solution**

Conceptual

**Questions 20 – 21: Which of the following will come in the position of (?)**

20. 4A, 10D, 22G, 46J, 94M?  
 (1) 168N (2) 128P (3) 190P (4) 156L

**Answer (3)**

**Solution**

4A, 10D, 22G, 46J, 94M

4, 10, 22, 46, 94 A, D, G, J, M

$4 \times 2 + 2 = 10$  1 4 7 10 13

$10 \times 2 + 2 = 22$   $\therefore 13 + 3 = 16$

$22 \times 2 + 2 = 46$  = P

$46 \times 2 + 2 = 94$

$94 \times 2 + 2 = 190$   $\therefore$  Answer = 190P

21. 2Z57Y714X923W1134V13?  
 (1) 45U14 (2) 47U15 (3) 27W24 (4) 47V14

**Answer (2)**

**Solution**

2Z5, 7Y7, 14 x 9, 23W11, 34V13

2 5 = 9 5 Z

7 + 9 = 14 7 Y

14 + 9 = 23 9 X

23 + 11 = 34 11 W

34 + 13 = 47 13 V

15 U

$\therefore$  47U15

**Questions 22 -24: Seven towns  $T_1, T_2, T_3, T_4, T_5, T_6$  and  $T_7$  are situated as follows**

$T_5$  is 8 km to the west of  $T_2$

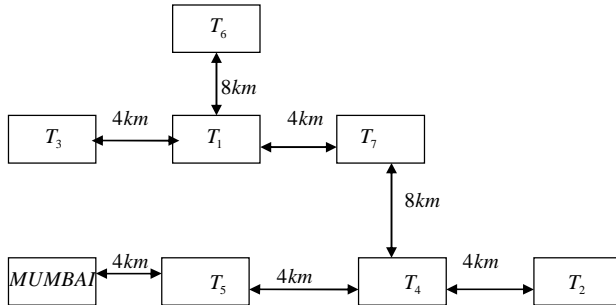
$T_6$  is 8 km to the north of  $T_1$

$T_4$  is 8 km to the south of  $T_7$

$T_7$  is 8 km to the east of  $T_3$

$T_3$  is 4 km to the west of  $T_1$

$T_4$  is exactly in the middle of  $T_2$  and  $T_5$



22. How far is  $T_1$  from  $T_7$  ?

- (1) 8 km                      (2) 4 km                      (3) 6 km                      (4) 12 km

**Answer (2)**

**Solution**

$$T_1T_7 = 4km$$

23. Raju starts from  $T_1$  and goes to Mumbai via  $T_3$  how much distance was covered by Raju if Mumbai is 4 km to the west of  $T_5$  ?

- (1) 6 km                      (2) 8 km                      (3) 4 km                      (4) 12 km

**Answer (4)**

**Solution**

$$T_1 \text{ to Mumbai via } T_3 = 4 + 8 = 12km$$

24. If Mumbai is located 4 km to the west of  $T_3$  how far it would be from  $T_4$

- (1) 4 km                      (2) 12 km                      (3) 8 km                      (4) 6 km

**Answer (3)**

**Solution**

$$T_4 \text{ to Mumbai} = 4 + 4 = 8 \text{ km}$$

**Question: 25**

25. If  $r$  represents '+'

$x$  represents '-'

$s$  represents 'X'

$u$  represents ' $\div$ '

$\emptyset$  represents '=', which of the following is correct?

- (1)  $9x2r10u3\emptyset14s4$                       (2)  $9r2s10x3\emptyset14u4$   
 (3)  $9s4x14r10u2\emptyset27$                       (4)  $9u3x2r10\emptyset14s4$

**Answer (3)**

**Solution**

$$9s4x+14r10u2\emptyset27$$

$$\Rightarrow (9 \times 4) - 14 + (10 \div 2) = 27$$

$$\Rightarrow 36 - 14 + 5 = 27$$

$$27 = 27$$

**Question: 26 Read the information and answer the question No 26**

Find friends R, S, T, U and X wore shirts of brown, yellow, green, pink and blue colours and shorts of white, black, grey, blue and yellow colours

Nobody wore shirt and shorts of same colour

T wore yellow shorts and U wore blue shirt

The one who wore yellow shirt wore white shorts and one who wore blue shorts wore pink shirt

R wore black shorts and brown shirt

X did not wear pink shirt

26. Who wore blue shorts?

- (1) T (2) U (3) S (4) X

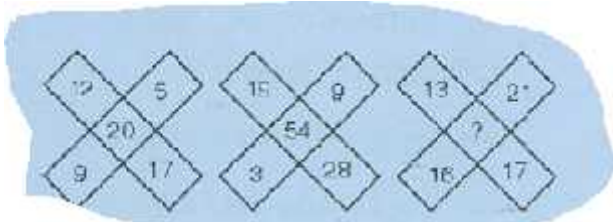
**Answer (3)**

**Solution**

Shirts → Br. Yel Grn → X Pink → No X Blue → T  
 Short → Wht Blk Grey Blue → S Yellow

**Questions 27- 28: The numerals are given on the basis of some rule and one space is marked by (?). Find the correct answer from the four alternative to replace the question mark**

27.



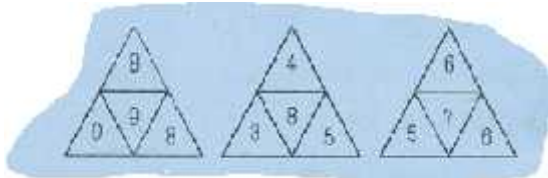
- (1) 15 (2) 20 (3) 23 (4) 40

**Answer (2)**

**Solution**

$17 - 12 = 5$	$28 - 19 = 9$	$17 - 13 = 4$
$9 - 5 = 4$	$9 - 3 = 6$	$21 - 16 = 5$
$5 \times 4 = 20$	$9 \times 6 = 54$	$4 \times 5 = 20$

28.

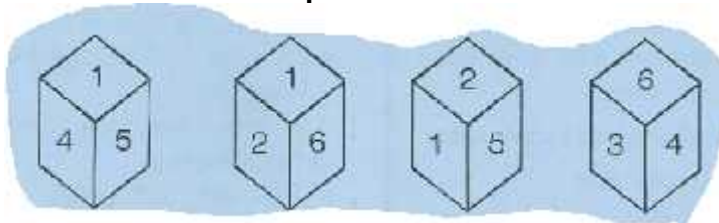


- (1) 2 (2) 3 (3) 4 (4) 5

**Answer (4)**

Conceptual

**Question 29: is bases on various faces of a cube. Six sides of cube are numbered 1 to 6. Study the faces and answer the questions**

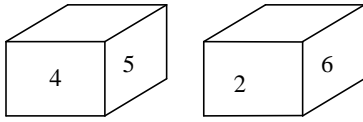


29. Which number is on opposite of 1?

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

**Answer (3)**

**Solution**



- 4 → 2      opp to 1 = 3  
 5 → 6  
 1 → 3

30. What letter should replace the question mark?

F	J	P	L	G	P	K
R	K	F	I	N	F	J
X	F	V	G	U	J	?

- (1) U (2) A (3) K (4) 1

**Answer (3)**

**Solution**

$6^{\oplus}$ F	$10^{-}$ 5	$16^{\oplus}$ P	$12^{-}$ 2	$7^{\oplus}$ 4	$-$ P	$11^{\oplus}$ K
18R	4D	6F	9 1	14N	F	J 10
+ 24 X	6F	22V	3C	21U	J	? 21

∴ 21 → U

**Question 31**

	0	1	2	3	4	5	6	7	8	9
0	A	Q	E	R	C	X	O	N	E	H
1	D	G	B	F	Q	P	D	Y	K	M
2	X	M	L	M	K	P	C	J	W	V
3	N	P	U	S	B	Q	I	G	B	F
4	O	C	L	G	W	Y	H	T	U	A
5	H	I	Y	K	R	S	L	F	I	E
6	Z	N	O	V	J	A	G	J	Z	D

The columns of the matrix are numbered from 0 to 9 and rows are numbered from 0 to 6. A letters from this matrix can be represented first by its row and next by its column. For example, N can be represented by 30 or 61 etc. Now find the answer for the following question

31. Identify the set of numbers corresponding to the word MATCH

- (1) 23, 10, 43, 40, 56 (2) 21, 49, 43, 41, 64 (3) 21, 65, 47, 26, 50 (4) 19, 46, 47, 04, 46

**Answer (3)**

**Solution**

MATCH → 21, 65, 47, 26, 50

32.

**Question 32: In the following question two statements are followed by four conclusions numbered I, II, III and IV. You have to take the two given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions together and then decided which of the given conclusions logically follows from the two given statements**

**Statements**

- (a) All red are green  
 (b) All green are white



## Conclusions

- (i) Some green are red
- (ii) Some white are red
- (iii) Some red are not white
- (iv) All white are green

- (1) Only I and II follows
- (2) Only II and III follows
- (3) Only I and IV follows
- (4) Only I and IV follows

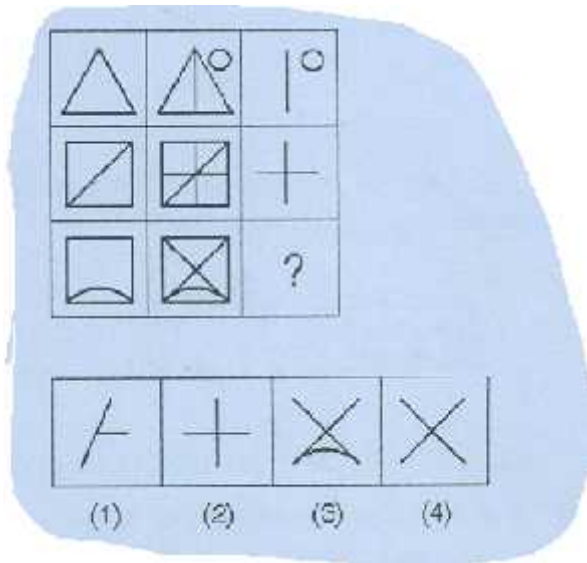
**Answer (1)**

**Solution**

Conceptual

**Questions 33 – 34: Each of the items 33-34 consists of a square of 9 cells in three rows and three columns. The designs in each row or column follow the same rule. Choose the correct answers form among the given alternatives to suit the cell indicated by the question mark**

33.

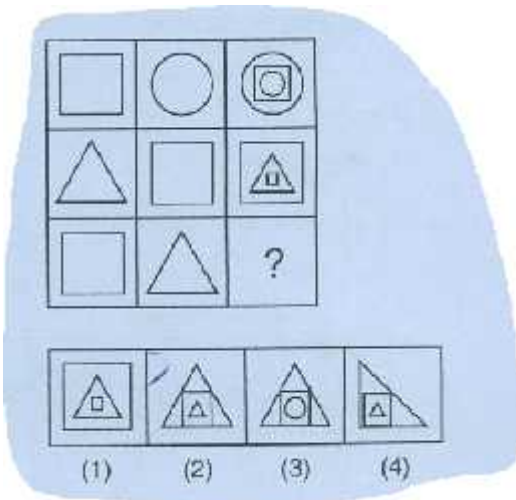


**Answer (4)**

**Solution**

Conceptual

34.

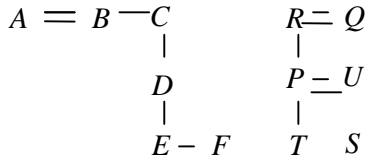


**Answer (2)**

**Solution**

Conceptual

Questions 35 – 36: P, Q, R, S, T, U are six members of a family. P is son of R and T is the daughter of P, S is the daughter of U, who is the mother of T, Q is the spouses of R



Here  $\square \rightarrow$  male  
 $\bigcirc \rightarrow$  female

35. How many male members are in the family?  
 (1) 1 (2) 2 (3) 3 (4) 4

**Answer (2)**

**Solution**

Males = p and (either R or Q) = 2

36. Which of the following pairs represents parents?  
 (1) PR (2) RT (3) QT (4) PU

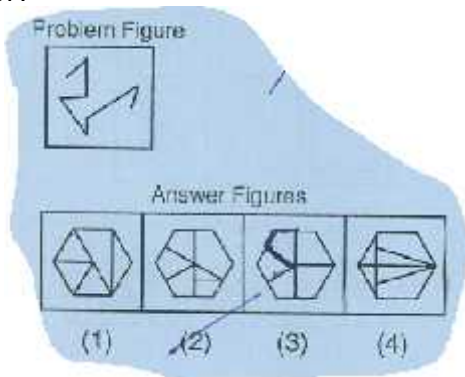
**Answer (4)**

**Solution**

Pairs = (P, U) & (R, Q) = 2  
 PU

Questions 37 – 38: in each of the questions a problem figure is followed by four answer figures. The problem figure is embedded in one of the answer figures. Find out that answer figure

37.

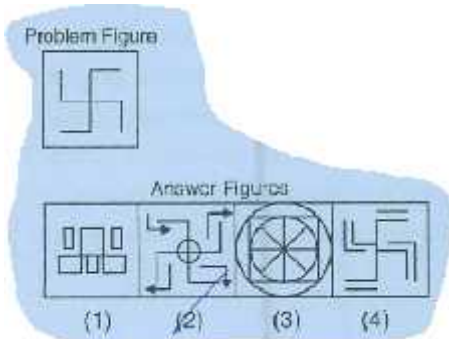


**Answer (2)**

**Solution**

Conceptual

38.



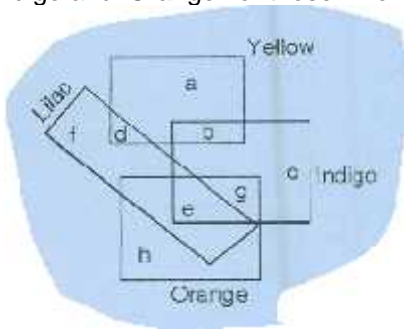
**Answer (3)**

**Solution**

Conceptual

39.

**Question 39:** In the following diagram, there are four rectangles labeled as Lilac, Yellow, Indigo and Orange. Rectangle 'Lilac' represents the persons who like Lilac, 'Yellow' for those who like Yellow, 'Indigo' for those who like Indigo and 'Orange' for those who like Orange. Study the diagram and carefully answer the question



Persons who like Yellow and Lilac but not Indigo?

(1) d

(2) f

(3) a

(4) b

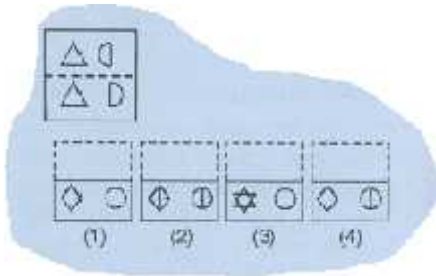
**Answer (1)**

**Solution**

Conceptual

**Questions 10 – 41:** In each of the questions a transparent sheet with a pattern is given. Find out from among the given alternatives as to how the pattern would appear when the transparent sheet is folded along the dotted line

40.

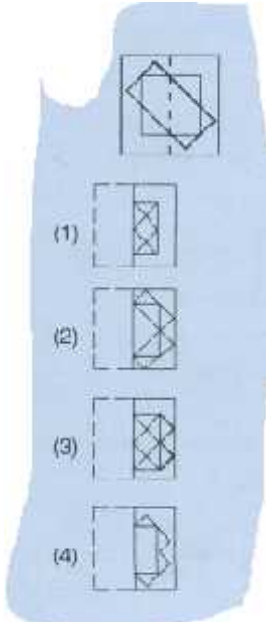


**Answer (3)**

**Solution**

Conceptual

41.



**Answer (4)**

**Solution**

Conceptual

**Questions 42: Read the information carefully and answer the question 42**

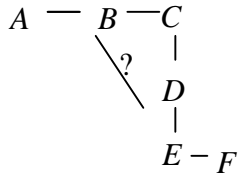
- P □ Q means P is the brother of Q
- P Δ Q means P is the father of Q
- P + Q means P is the mother of Q
- P ≠ Q means P is the husband of Q
- P - Q means P is the sister of Q

42. Four statements 1, 2, 3, 4 are given which statement is correct form the

**Answer (3)**

**Solution**

$$A \neq B - C \Delta + E \square F$$



∴ B is aunt of D

**Expression**

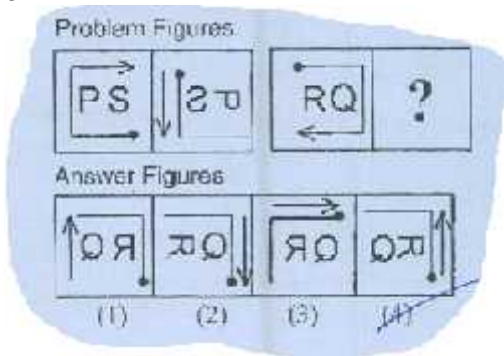
$$A \neq B - C \Delta + E \square F$$

**Statements**

- (1) C is the father of E      (2) D is the grandmother of F      (3) B is the aunt of D      (4) A is the father of D

**Questions 43 – 45: In the problem figures in each question there is a definite relationship between the first tow figures. From the set of the four answer figures given, find the figure that would establish the same relationship between the next tow figures**

43.

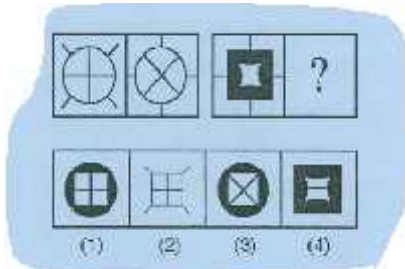


**Answer (4)**

**Solution**

Conceptual

44.

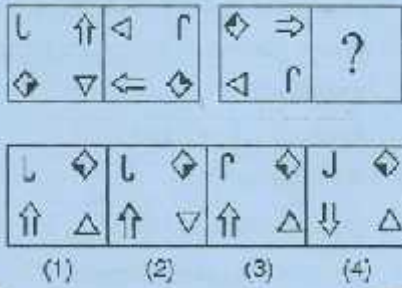


**Answer (4)**

**Solution**

Conceptual

45.

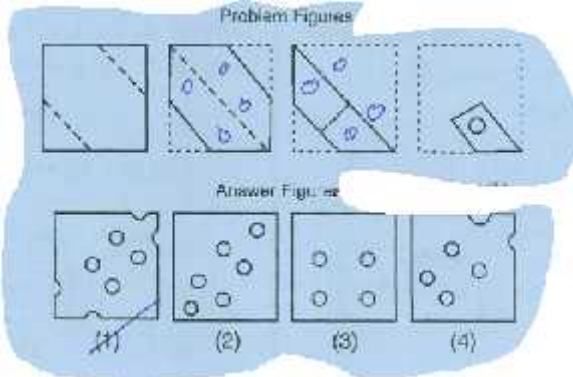


**Answer (2)**

**Solution**

Conceptual

46. A piece of paper is folded and punched as shown below in the problem figures. How will it appear when opened?  
Choose your answer from the answer figures



**Answer (2)**

**Solution**

Conceptual

47. Find the mirror image of the word 'PIONEER';

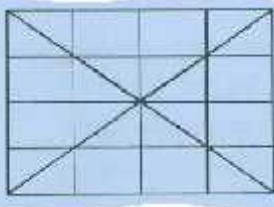
- (1) REENOIP (2) PIONEER (1)  
(3) REENOIP (4) PIONEER

**Answer (2)**

**Solution**

Conceptual

48. Find the number of triangles in the figure



(1) 32

(2) 40

(3) 48

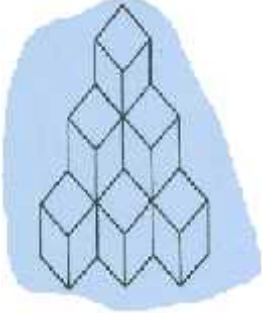
(4) 44

**Answer (2)**

**Solution**

Conceptual

49. How many cubes are there in the following figure?



(1) 5

(2) 9

(3) 10

(4) 12

**Answer (3)**

**Solution**

Conceptual

50. A mother said to her son "I was as old as you are at present and the time of your birth". If the mother's age is 36 years now the son's age 6 years back was

(1) 10

(2) 12

(3) 14

(4) 13

**Answer (2)**

**Solution**

When born, let Mother's age = X

∴ After 'y' years,

Mother's age = x = y

Son's age = y

But x = y

Given x + y = 36

$$2x = 36$$

$$X = 18$$

∴ Son's age 6 years back = 18 - 6 = 12

### Language Test

**Questions (51 – 55):** Read the following passage and choose the correct option from those given below to answer the questions. Detective stories tend to glorify crime murders, gangsters and crooks of all kinds who are described as tough, cunning and courageous individuals who know how to take care of themselves and how to get what they want. In James Mc Cain's the postman Always Rings Twice, for instance, the villain is much more impressive than his victim. He is casual, brave, smart and successful with women. It is true that he finally gets caught. But he is punished for a crime that he did not commit, so that his conviction is hardly a triumph of justice. Besides, looking back over the exciting life of the criminal, the reader might conclude that it was worth the risk

51. The passage mentions James McCain as

(1) An author of detective stories

(2) Brave, smart and successful with women

(3) Tough, cunning and courageous

(4) Being more impressive than others

**Answer (1)**

52. Murderers, gangsters and crooks \_\_\_\_\_

(1) Always do not manage to get away

(2) Are often glorified in detective stories

(3) Are wiser than their victims

(4) Know how to escape from law always

**Answer (2)**

53. A criminal in a detective story generally gets caught \_\_\_\_\_

(1) For the crimes he committed

(2) Because of his careless mistakes

(3) Because the police is smarter than the criminals

(4) for the crimes he did not commit

**Answer (4)**

54. According to the passage, the life of a criminal is

(1) Exciting

(2) Hardly worth the risk

(3) Seldom presented in the right perspective

(4) A triumph of justice

**Answer (1)**

55. The passage tells that detective stories  
 (1) Make interesting reading (2) Are hardly worth reading  
 (3) Encourage readers to condemn crimes (4) Tend to create wrong notion about crime and punishment  
**Answer (4)**

**Questions 56 – 60:** Read the following poem and answer the questions given after it. The Eagle He clasps the crag with crooked hands. Close to the sun in lonely lands. Ringed with the azure world he stands. The wrinkled sea beneath him crawls. He watches form this mountain walls. And like a thunderbolt he falls

56. What is the eagle doing in the poem?  
 (1) Dying of old age (2) Hunting the prey  
 (3) Learning joyfully to fly (4) Keeping watch over the young ones  
**Answer (2)**

57. What does 'azure world' refer to?  
 (1) Forest (2) The sky (3) The cliff (4) Nature  
**Answer (2)**

58. 'The wrinkled sea beneath him crawls'. What does the poet mean by 'crawls'?  
 (1) The movement of the waves (2) The roaring of the sea  
 (3) The clasping of the prey (4) the fight of the bird  
**Answer (1)**

59. The rhyme scheme followed in the poem is \_\_\_\_\_  
 (1) ab ab ab (2) ba ba ba (3) aaa bbb (4) bbb aaa  
**Answer (3)**

60. "He clasps the crag with crooked hands". The line is an example for  
 (1) Rhyming words (2) Assonance (3) Simile (4) Alliteration  
**Answer (4)**

61. In the question below, there are six sentences. The first and the last sentences are given. Find the order in which the sentences P, Q, R and S will appear in the paragraph to make it a meaningful one

S1. In 1739, Nadir Shah, the mighty king of Iran, invaded India

S2. \_\_\_\_\_

S3. \_\_\_\_\_

S4. \_\_\_\_\_

S5. \_\_\_\_\_

S6. The Peacock throne built by Shah Jahan was also taken away by him

P → After a stay of two months, the went back to Iran

Q → He defeated the Mughal army in the bate of karnal

R → He took with him immense wealth as well as the Kohinoor diamond

S → This was followed by the cruel massacre and reckless plunder of Delhi

- (1) SPRQ (2) QPSR (3) RQPS (4) QSPR

**Answer (4)**

**Question 63 – 64: Choose the word which best fills the blank from the four options given**

62. The state in which the few govern the may is  
 (1) Monarchy (2) Oligarchy (3) Plutocracy (4) Autocracy

**Answer (2)**

63. Air pollution can  
(1) Alleviate (2) Alienate (3) Abdicate (4) Aggravate

**Answer (4)**

64. identify the set of words which are only nouns  
(1) Pompous, ridiculous, photography (2) Penance, science, porous  
(3) Analysis, philosophy, thesis (4) Poisonous, vocalize, stupid

**Answer (3)**

65. Although Prakash never learned to read, his exceptional memory and inquisitive mind made him an \_\_\_\_ person  
(1) Apathetic (2) Indolent (3) Imbecile (4) Erudite

**Answer (4)**

66. The survival of mankind itself in danger due to the \_\_\_\_\_ of atomic and nuclear weapons  
(1) Regularization (2) Provocation (3) Proliferation (4) Exploration

**Answer (3)**

67. Mary was attacked by a \_\_\_\_\_  
(1) Swarm (2) Herd (3) Troop (4) Crowd

**Answer (1)**

68. "Meet me at the new building \_\_\_\_\_ at noon", the architect said  
(1) Sight (2) Cite (3) Site (4) Seat

**Answer (3)**

69. That which cannot be corrected is \_\_\_\_\_  
(1) Incomprehensible (2) Indelible (3) Illegible (4) Incurable

**Answer (4)**

**Question 70 – 74:** In the following passage there are some blanks that are numbered. Fill in the blanks by selecting the most appropriate word from the given options. The body were \_\_\_\_\_ (120) \_\_\_\_\_ (121) after months of cleaning and packing, they were moving into their new home. Boxes lay in a neat \_\_\_\_\_ (122) in the hall of their old home, full of their clothes, toys and books. When the removal van arrived, they helped to big and \_\_\_\_\_ (123) movers carry the light boxes to the van. Their new house was just \_\_\_\_\_ (124) blocks away from their school

70. (1) Annoyed (2) Worried (3) Excited (4) Horrified

**Answer (3)**

71. (1) Finally (2) Firstly (3) Hardly (4) Rarely

**Answer (1)**

72. (1) Bunch (2) Bundle (3) Pack (4) Pile

**Answer (4)**

73. (1) Scrawny (2) Weedy (3) Lanky (4) Burly

**Answer (4)**

74. (1) Few (2) A few (3) Many (4) Less

**Answer (2)**

Questions 75 – 76: Select the meaning of the given phrase/idioms

75. A man of straw  
(1) A man gifted with talents (2) A greedy man  
(3) A man of little worth (4) A common man

**Answer (3)**



76. To set one's face against  
(1) To judge by appearance (2) To look at one steadily  
(3) To get out of difficulty (4) to oppose with determination  
**Answer (4)**

**Questions 77 – 78: Identify the part in the following sentences that is incorrect**

77. No sooner did the bell rang then there was/ a scramble for/ getting out of the class  
(1) (2) (3) (4)

**Answer (1)**

78. Though senior in age/ his father is/ junior then/ may father in service  
(1) (2) (3) (4)

**Answer (3)**

**Questions 79 – 81: Select the word which means the opposite of the given word/ underlined word**

79. Humility  
(1) Integrity (2) Disgrace (3) Modesty (4) Pride

**Answer (4)**

80. Relinquish  
(1) Abandon (2) Accept (3) Resign (4) Renounce

**Answer ( )**

81. Harish eats cakes with great relish but he has a \_\_\_\_\_ for wine  
(1) Craze (2) Appetite (3) Distaste (4) Hunger

**Answer (3)**

82. Rema's mother scolded her for being indolent. The word 'indolent' means  
(1) Innocent (2) Lazy (3) Energetic (4) Angry

**Answer (2)**

83. Our school's efficacious dance fest raised funds for charity. The word 'efficacious' means  
(1) Unavailing (2) Bootless (3) Abortive (4) Effectual

**Answer (4)**

**Questions 84 – 85: Identify the word correctly spelt from the options given**

84. (1) Randezvus (2) Randezvous (3) Rendezvous (4) Rendezvus

**Answer (3)**

85. (1) Treacherous (2) Tracherus (3) Treacherous (4) Tracherous

**Answer (1)**

**Questions 86 – 88: Choose the most appropriate phrasal verbs to complete the sentences**

86. I am filled with wonder when I consider the immeasurable \_\_\_\_\_ the lighter and the darker side of life  
(1) Contrasts between (2) Contrasts off (3) Contrasts with (4) Contrasts among

**Answer (1)**

87. How did the accident \_\_\_\_\_?  
(1) Come by (2) Come about (3) Come across (4) Come over

**Answer (2)**

88. The host was easily \_\_\_\_\_ by sweet words  
(1) Taken after (2) Taken off (3) Taken up (4) Taken in

**Answer (4)**

**Questions 89 – 100: Choose the most appropriate answer from the options given**

89. I often \_\_\_\_\_ scolded at school

- (1) Would get                      (2) Get                                      (3) Will get                              (4) Got

**Answer (2)**

90. There are various activities for us to \_\_\_\_\_ in our leisure time

- (1) Pursue                      (2) Inspire                                      (3) Utilise                                      (4) Contribute

**Answer (1)**

91. "Mind your own business" he said

- (1) Meekly                      (2) Sharply                                      (3) Softly                                      (4) Hardly

**Answer (2)**

92. We cannot \_\_\_\_\_ the educational policy as a panacea to all academic illness

- (1) Look after                      (2) Look down                                      (3) Look into                                      (4) Look upon

**Answer (4)**

93. If I \_\_\_\_\_ early, I will meet her

- (1) Had gone                      (2) Went                                      (3) Go                                      (4) were gone

**Answer (3)**

94. You never call me \_\_\_\_\_

- (1) Do you                      (2) Did you                                      (3) Don't you                                      (4) had you

**Answer (1)**

95. The play Macbeth is a tragedy of a man who was \_\_\_\_\_ with great qualities

- (1) Empowered                      (2) Obsessed                                      (3) Privileged                                      (4) Endowed

**Answer (4)**

96. It was the most dreadful accident I \_\_\_\_\_ ever \_\_\_\_\_

- (1) Have, seen                      (2) has, seen                                      (3) Will, seen                                      (4) had, seen

**Answer (4)**

97. I have been studying hard to \_\_\_\_\_ my examinations

- (1) Get up                      (2) Get around                                      (3) Get along                                      (4) Get through

**Answer (4)**

98. Let's play the game of chess \_\_\_\_\_?

- (1) Will we                      (2) Won't we                                      (3) Shall we                                      (4) Shouldn't we

**Answer (3)**

99. The council \_\_\_\_\_ threatened to launch an indefinite strike form next mother to \_\_\_\_\_ their demands

- (1) Has, press                      (2) had, press                                      (3) Did, get                                      (4) Had, get

**Answer (1)**

100. A short piece of writing on a tomb is know as

- (1) Epitome                      (2) Epistle                                      (3) Epilogue                                      (4) Epitaph

**Answer (4)**



Roll Number

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**STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING**  
**STATE LEVEL NATIONAL TALENT SEARCH EXAMINATION – 2016**  
**Class – X**  
**Part – I**  
**SCHOLASTIC APTITUDE TEST (SAT)**

Time : 90 Minutes

Maximum Marks : 100

**INSTRUCTIONS TO CANDIDATES :**

Read the following instructions before you answer the questions. Answers are to be given in a SEPARATE OMR ANSWER SHEET provided inside this booklet. Break the seal and start answering the questions once asked to do so.

- Please write your ROLL NUMBER very clearly (only one digit in one block) as given in your Admission Card.
- There are 100 questions in this test. The questions are arranged in the following order :
  - Questions 1 to 40 belong to Science Subjects.
  - Questions 41 to 60 are on Mathematics Subjects.
  - Questions 61 to 100 are on Social Science.
- Select the most suitable answer for each question and completely darken the circle corresponding to the correct alternative as shown below.

<b>Correct Method</b>	<b>Wrong Method</b>
①   ②   ●   ④	①   ⊗   ⊗   ●

- All questions carry ONE MARK each.
- There is no negative mark. Every correct answer will be awarded one mark.
- Do not write your name on any part of the question booklet or on the answer sheet.

**പരീക്ഷാർത്ഥികൾക്കുള്ള നിർദ്ദേശങ്ങൾ :**

ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാൻ തുടങ്ങുന്നതിന് മുമ്പ് താഴെ കൊടുത്തിരിക്കുന്ന നിർദ്ദേശങ്ങൾ സശ്രദ്ധം വായിക്കുക. ഉത്തരം നൽകേണ്ടത് ഒരു പ്രത്യേക ഉത്തരക്കടലാസിൽ ആണ്. നിർദ്ദേശത്തിനു ശേഷം മാത്രമേ സീൽ തുറക്കുവാനും, ഉത്തരം എഴുതുവാനും പാടുള്ളൂ.

- നിങ്ങളുടെ റോൾ നമ്പർ (ഒരു കള്ളിയിൽ ഒരു അക്കം മാത്രം) വ്യക്തമായി നിങ്ങളുടെ പ്രവേശന പത്രത്തിൽ രേഖിരിക്കുന്നതു പോലെ എഴുതുക.
- ഈ പരീക്ഷാപുസ്തകത്തിൽ 100 ചോദ്യങ്ങളുണ്ട്. ചോദ്യങ്ങൾ താഴെ കൊടുത്തിരിക്കുന്ന പ്രകാരം ക്രമപ്പെടുത്തിയിരിക്കുന്നു.
  - 1 മുതൽ 40 വരെയുള്ള ചോദ്യങ്ങൾ ശാസ്ത്രത്തിൽ നിന്ന്.
  - 41 മുതൽ 60 വരെയുള്ള ചോദ്യങ്ങൾ ഗണിതത്തിൽ നിന്ന്.
  - 61 മുതൽ 100 വരെയുള്ള ചോദ്യങ്ങൾ സാമൂഹ്യ ശാസ്ത്രത്തിൽ നിന്ന്.
- ഓരോ ചോദ്യത്തിനും ഉചിതമായ ഉത്തരം തിരഞ്ഞെടുത്ത് ശരിയായ ഉത്തരത്തെ സൂചിപ്പിക്കുന്ന വൃത്തം മാത്രം താഴെ കൊടുത്തിരിക്കുന്ന വിധത്തിൽ പൂർണ്ണമായി കറുപ്പിക്കുക.

ശരിയായ രീതി	തെറ്റായ രീതി
①   ②   ●   ④	①   ⊗   ⊗   ●

- എല്ലാ ചോദ്യങ്ങൾക്കും ഒരു മാർക്ക് വീതം.
- സ്വന്ത മാർക്ക് ഇല്ല. ഓരോ ശരി ഉത്തരത്തിനും ഒരു മാർക്ക് വീതം ലഭിക്കും.
- നിങ്ങളുടെ പേര് ചോദ്യ പുസ്തകത്തിന്റെയോ ഉത്തരക്കടലാസിന്റെയോ ഒരു ഭാഗത്തും എഴുതുവാൻ പാടില്ല.

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**State Level National Talent Search Examination – 2016**  
**Scholastic Aptitude Test**

1. The enzymes commonly called 'Genetic Scissors' are  
(1) Ligases                      (2) Lipases                      (3) Restriction endonucleases                      (4) Proteases

**Answer (3)**

**Solution**

The enzymes commonly called genetic scissor's are

2. Chooses the group that contains fungi only  
(1) Euglena, lichen                      (2) Yeast, mushroom                      (3) Anabaena, Amoeba                      (4) Paramecium, mycoplasma

**Answer (2)**

**Solution**

Choose the group that contains fungi only

3. Climbers grow towards and around a support is an example of  
(1) Hydrotropism                      (2) Haptotropism                      (3) Geotropism                      (4) Phototropism

**Answer (2)**

**Solution**

Climbers grow to wards and around a support is an example of

4. Select the correct statement regarding the arrangement of aminoacidds in beta (S) chain of haemoglobin

- (1) Same in man and rat                      (2) Same in man and chimpanzee  
(3) Different in man and chimpanzee                      (4) same in man and gorilla

**Answer (3)**

**Solution**

Select the correct statement regarding the arrangement of amino ad in beta chain of hemoglobin

5. The gas responsible for ozone depletion is  
(1) Nitrogen and argon                      (2) Carbon dioxide                      (3) Carbon monoxide                      (4) Chlorofluorocarbons

**Answer (4)**

**Solution**

The gas responsible for  $O_3$  depletion

6. Chromosomes are composed of  
(1) DNA and protein                      (2) RNA and lipids                      (3) Ribosomes and lipids                      (4) DNA and lipids

**Answer (1)**

**Solution**

Chromosomes are composed of

7. Choose the immune response of basophil  
(1) Engulfs and destroys the bacteria  
(2) Produces chemical substances that destroy foreign bodies  
(3) Dilates the blood vessels  
(4) Produces chemical substances needed for inflammatory response

**Answer (1)**

**Solution**

Choose the immure response of basophil

8. Decreases in the production of dopamine causes  
(1) Parkinson's                      (2) Meningitis                      (3) Alzheimer's                      (4) Epilepsy

**Answer (1)**

**Solution**

Decrease in the production of dopamine causes

9. The excretory organ in cockroach is  
(1) Kidney                      (2) Malpighian tubules                      (3) Contractile vacuoles                      (4) Nephridia

**Answer (2)**

**Solution**

Excretory organ in cockroach is

10. The three R's to save the environment represent

- (1) Repeat, Reduce, Resale  
(3) Recycle, Reuse, Repeat

- (2) Reuse, Reduce, Resale  
(4) Reduce, Recycle, Reuse

**Answer (4)**

**Solution**

The three R's to save environment represent

11. Gland are modified from of

- (1) Epithelial tissue (2) Cardiac tissue (3) Muscular tissue (4) Connective tissue

**Answer (1)**

**Solution**

Glands are modified from of

12. Movement of water molecules from a region of its higher concentration to a region of its lower concentration through a semi permeable membrane is called

- (1) Plasmolysis (2) Endocytosis (3) Osmosis (4) Diffusion

**Answer (3)**

**Solution**

Movement of water molecules from a region of its higher none to a region of its lower conc. through a semi permeable membrard is called

13. Which of the following statement is correct about tendons?

- (1) Connect bones to bones (2) Connect bones to muscles  
(3) Smoothen bound surfaces (4) Fibrous tissue with high flexibility

**Answer (2)**

**Solution**

Which of the following statement is correct about tendons?

14. Select the process that occurs in dark reaction

- (1) Light energy is converted into chemical energy (2) Water splits into hydrogen and oxygen  
(3) Hydrogen is added to carbon dioxide (4) Oxygen is evolved

**Answer (3)**

**Solution**

Select the process that occurs in dark reaction

15. Which of the following statements DO NOT match which the postulates of Bohr's mode of atom?

- (a) Electrons are revolving around the nucleus in specified paths called orbits/shells  
(b) Each shell is associated with definite amount of energy  
(c) Electron, while revolving through a particular shell can increases or decreases its energy  
(d) Energy of the shells decreases as their distance form nucleus increases

Select the correct alternative

- (1) C and (d) (2) (b) and (c) (3) (a) and (c) (4) (b) and (d)

**Answer (1)**

**Solution**

The energy of electron in a particular cell is quantized

Energy of shells  $1/\text{Distance b/w nucleus \& shell}$

16. Which of the following statements are NOT CORRECT?

- (1) Isobars are atoms of same elements (2) Isotopes are atoms of different elements  
(3) Isotones are atoms of same elements (4) Isotones are atoms of different elements

**Answer (3)**

**Solution**

Eg: Isobars -  ${}_{18}^{40}\text{Ar}$   ${}_{20}^{40}\text{Ca}$

Isotopes -  ${}_{1}^1\text{H}$   ${}_{1}^2\text{H}$

Isotones -  ${}_{6}^{13}\text{C}$   ${}_{7}^{14}\text{N}$

17. Which of the following represents the sequence in which the given compounds are arranged in the increasing order of the electronegative difference of their component elements?  $CH_4, NaCl, CO, Na_2O, MgCl_2$

- (1)  $CH_4 < MgCl_2 < CO < NaCl < Na_2O$       (2)  $Na_2O < CO < MgCl_2 < NaCl < CH_4$   
 (3)  $MgCl_2 < Na_2O < CO < CH_4 < NaCl$       (4)  $CH_4 < CO < MgCl_2 < NaCl < Na_2O$

**Answer (4)**

**Solution**

e.n:  $O > Cl > C > H > Mg > Na$   
 3.5 3 2.5 2.1

18. Water is a compound with relatively low molecular mass ( $18g\ mol^{-1}$ ). But it exists as a liquid at room temperature. This is because

- (1) Water molecules have angular geometry  
 (2) Electronegative difference between hydrogen and oxygen is less  
 (3) Water hydrogen and oxygen is less  
 (4) Water is a universal solvent

**Answer (3)**

Conceptual

19. Which of the following represents pairs of metalloids?

- (a) Si & Sb                      (b) Pb & Sb                      (c) Ru & Rh                      (d) Ge & As  
 (1) (b) and (d)                  (2) (a) and (c)                  (3) (b) and (c)                  (4) (a) and (d)

**Answer (4)**

**Solution**

Metalloids: Si                      Ge                      As                      Sb                      Tc                      Po

20. Which of the following reactions requires the highest temperature to occur?

- (1)  $N_2 + O_2 \rightarrow 2NO$                       (2)  $2NO + O_2 \rightarrow 2NO_2$   
 (3)  $NH_4NO_2 \rightarrow N_2 + 2H_2O$                       (4)  $4NO_2 + 2H_2O + O_2 \rightarrow 4HNO_3$

**Answer (1)**

**Solution**

Conceptual

21. The total number of electrons in 1kg glucose ( $C_6H_{12}O_6$ ) is [Molecular mass of glucose is 18 u]

- (1)  $6.022 \times 10^{23}$                       (2)  $1.8 \times 10^5$                       (3)  $3.346 \times 10^{21}$                       (4)  $3.2 \times 10^{26}$

**Answer (4)**

**Solution**

$$\text{Glucose} = \frac{1000}{180}$$

$$\text{Molecules} = \frac{1000}{180} \times na$$

$$\text{No of electrons} = \frac{1000}{180} \times na \times 96 = 3.2 \times 10^{26}$$

22. Which of the following are NOT CORRECT for a gaseous reversible reaction when pressure is increased?

- (a) Distance between gaseous molecules decreases  
 (b) Number of molecules per unit volume decreases  
 (c) Reaction proceeds in the direction in which there is increase in number of moles  
 (d) Reaction proceeds in the direction in which there is decrease in number of moles

Selection the correct alternative

- (1) (a) and (d)                      (2) (b) and (d)                      (3) (a) and (c)                      (4) (b) and (c)

**Answer (4)**

**Solution**

It is explained based on Le Chatelier's principle conceptual

23. In which of the following solutions iron gets oxidized?  
 (a) Silver nitrate (b) Zinc sulphate (c) Magnesium sulphate (d) Copper sulphate  
 (1) (b) and (d) (2) (a) and (c) (3) (b) and (c) (4) (a) and (d)

**Answer (4)**

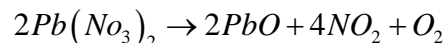
**Solution**

Electron chemical series:  $Li > Na > K > Mg > Al > Zn > Fe > Sn > Pb > H > Cu > Hg > Ag > Au$

24. When the reaction  $Pb(NO_3)_2 \rightarrow 2PbO + NO_2 + O_2$  is balanced the coefficients of the reactants and products in the balanced reaction will be  
 (2) 4, 2, 1, 2 (2) 2, 2, 4, 1 (3) 2, 4, 1, 2 (4) 4, 2, 2, 2, 1

**Answer (2)**

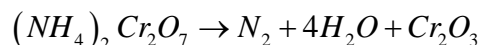
**Solution**



25. What is the volume of  $N_2$  gas formed at STP when 63g of  $(NH_4)_2Cr_2O_7$  is thermally decomposed according to the equation given below? (Atomic mass of Cr = 52, H = 1, N = 14, O = 16)  $(NH_4)_2Cr_2O_7 \rightarrow N_2 + 4H_2O + Cr_2O_3$   
 (1) 5.6L (2) 11.2L (3) 22.4L (4) 44.8L

**Answer (1)**

**Solution**



$$m = \frac{63}{252} = 0.25$$

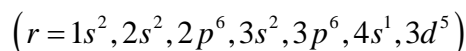
1 mole of  $N_2$  at STP = 22.4 l

0.25 mole of  $N_2$  at STP = 5.6 l

26. What is the number of s – electrons present in a chromium atom? (Atomic number of Cr – 24)  
 (1) 7 (2) 1 (3) 8 (4) 5

**Answer (1)**

**Solution**



27. The two elements X and Y have 5 and 7 valence electrons respectively. What will be the most probable formula of the compound formed between them?  
 (1)  $X_7Y_5$  (2)  $X_5Y_7$  (3)  $X_3Y$  (4)  $XY_3$

**Answer (4)**

**Solution**

	No of valence electrons	Valency
X	5	+ 3
Y	7	- 1

$$x^{+3}, y^{-1}$$

$$xy_3$$

28. The average acceleration of a body during a time interval 't' is given by the slope of its  
 (1) Velocity – speed graph (2) Velocity – time graph  
 (3) Speed – time graph (4) Velocity – displacement graph

**Answer (2)**

Conceptual

29. An object moving at a constant speed in a circular path experiences a force which is  
 (1) In the direction of motion  
 (2) Outwards and at  $45^\circ$  to the direction of motion  
 (3) Inwards and at right angles to the direction of motion  
 (4) Opposite to the direction of motion

**Answer (3)**

**Solution**

Inwards and at right angles to the direction of motion

30. A vehicle will acceleration as long as  
 (1) Air resistance is greater than the thrust  
 (2) Air resistance is greater than the inertia  
 (3) Thrust is greater than the sum of air resistance and friction  
 (4) Friction is greater than the thrust

**Answer (3)**

Conceptual

Thrust is greater than sum of air resistance and friction

31. Which of the following statement is correct? The force acting on an object is equivalent to  
 (1) Its change in momentum  
 (2) The impulse it receives per second  
 (3) The energy it gains per second  
 (4) Its acceleration per meter

**Answer (2)**

Conceptual

The impulse it receives per second

32. Work done by the force of gravity on a satellite of 500kg at a height of 36000km is

- (1) 0 J  
 (2)  $10^{31}$  J  
 (3)  $10^{21}$  J  
 (4)  $10^{9.8}$  J

**Answer (1)**

Conceptual

Satellite is in circular orbit. So displacement is perpendicular to force

33. Up thrust of water acting on a wooden cube of side 10cm immersed completely in water is (density of water =  $1000 \text{ kgm}^{-3}$  and  $g = 10 \text{ ms}^{-2}$ )

- (1) 5 N  
 (2) 10N  
 (3) 3 N  
 (4) 2N

**Answer (2)**

Conceptual

$$V_{\text{immersed}} \rho g$$

$$\text{Up thrust (or) Buoyant force} = (10\text{cm})^3 (1000\text{kg} / \text{m}^3)(10\text{m} / \text{s})$$

$$= 10\text{N}$$

34. Energy transferred to a stone of weight 10N, falling freely from the top of a tower of 250m height is about

- (1) 25000J  
 (2) 250000J  
 (3) 2500J  
 (4) 250J

**Answer (3)**

Conceptual

$$\text{Weight} = mg = 10\text{N}$$

$$\text{Height (H)} = 250\text{m}$$

$$\text{Potential energy } U = mgH = (10)(250)$$

$$= 2500\text{J}$$

35. The factor on which the speed of sound through air doesn't depend is

- (1) Humidity  
 (2) Density  
 (3) Temperature  
 (4) Frequency of sound

**Answer (4)**

Conceptual

Frequency of sound

36. The waves that required a material medium for their propagation are called

- (1) Matter waves  
 (2) Electromagnetic waves  
 (3) Carrier waves  
 (4) Mechanical waves

**Answer (4)**

Conceptual

Mechanical waves

37. How much heat does a 40W bulb generate in 1 hour?

- (1) 144000J  
 (2) 144J  
 (3) 1.44J  
 (4) 14J

**Answer (1)**

Conceptual

$$\text{Power} = 40\text{W}$$

$$\text{Time} = 1 \text{ hour} = 3600\text{sec}$$

$$\text{Energy} = 40(3600)$$

$$= 144000\text{J}$$

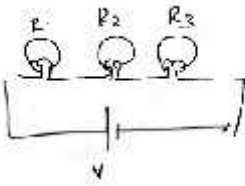


38. Three bulbs are rated 40W, 60W and 100W. Which bulb will glow brightly if they are connected in series across a 220V source?

- (1) 40W                      (2) 60W                      (3) 100W                      (4) All will glow equally bright

**Answer (1)**

Conceptual



Rated power

$$P_1 = 40W, R_1 = \frac{V^2}{40}$$

$$P_2 = 60W, R_2 = \frac{V^2}{60}$$

$$P_3 = 100W, R_3 = \frac{V^2}{100}$$

Voltage is divided in the ratio of resistance

$$P'_1 : P'_2 : P'_3 = i^2 R_1 : i^2 R_2 : i^2 R_3$$

Power generated =  $R_1 : R_2 : R_3$

$$= \frac{1}{40} : \frac{1}{60} : \frac{1}{100} = 15 : 10 : 6$$

∴ Bulb of 40w glows brighter

39. A device which uses the phenomenon of mutual induction is

- (1) AC generator                      (2) DC generator                      (3) Induction coil                      (4) Transformer

**Answer (4)**

Conceptual

Transformer

40. Indian Regional Navigation Satellite System (IRNSS) has a group of \_\_\_\_\_ satellites

- (1) 3                      (2) 5                      (3) 7                      (4) 9

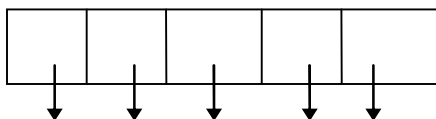
**Answer (3)**

41. Using the digits 1, 2, 3, 4, 5 without repetition, 120 five – digit numbers can be made. How many five – digit numbers can be made using the digits 0, 1, 2, 3, 4 without repetition?

- (1) 120                      (2) 100                      (3) 96                      (4) 24

**Answer (3)**

**Solution**



$$4 \times 4 \times 3 \times 2 \times 1 = 96$$

Zero can't come at 1<sup>st</sup> place, so 4 choices

42. In the arithmetic sequence  $\frac{3}{4}, 1\frac{1}{2}, 2\frac{1}{4}, \dots$  at which position does a perfect square appear first?

- (1) 192                      (2) 108                      (3) 48                      (4) 12

**Answer (2)**

**Solution**

$$\frac{3}{4}, \frac{6}{4}, \frac{9}{4}, \frac{12}{4} \dots \frac{36}{4} \text{ 12}^{\text{th}} \text{ term}$$

43. How much more is the sum of the first 40 terms of the arithmetic sequence 11, 21, 31 ... then the sum of the first 40 terms of the arithmetic sequence 12, 23, 34...?

(1) 1600 (2) 820 (3) 780 (4) 40

**Answer (2)**

**Solution**

$$S_{40} = \frac{40}{2}(2 \times 11 + 39 \times 10)$$

$$S_{40} = \frac{40}{2}(2 \times 12 + 39 \times 11)$$

$$S_{40} - S_{40} = \frac{40}{2}(2 \times 1 + 39 \times 1) = 820$$

44. The difference of the squares of two natural numbers is 101. What is the sum of their squares?

(1) 5000 (2) 5100 (3) 5101 (4) 5102

**Answer (3)**

**Solution**

$$a^2 - b^2 = (a - b)(a + b) = 101 \times 1$$

$$a + b = 101$$

$$a - b = 1$$

$$\Rightarrow a = 51, b = 50$$

45. Each three – digit numbers is written in a paper slip and put in a box. If one slip is drawn form it, what is the probability of its being a multiple of 9 which ends in 5?

(1)  $\frac{1}{9}$  (2)  $\frac{1}{18}$  (3)  $\frac{1}{90}$  (4)  $\frac{1}{100}$

**Answer (3)**

**Solution**

Multiple of ends in s mean add multiple of 45

$$a = 135, d = 90; an = 945$$

$$945 = 135 + (n - 1)d; d = 90$$

$$\Rightarrow n = 10$$

$$\therefore \text{Probability} = \frac{10}{900} = \frac{1}{90}$$

46. What number added to the polynomial  $3x^2 + 5x$  gives the square of a first degree polynomial?

(1)  $\frac{25}{12}$  (2)  $\frac{25}{24}$  (3)  $\frac{25}{36}$  (4)  $\frac{25}{48}$

**Answer (1)**

**Solution**

$$3\left(x^2 + \frac{5x}{3}\right) = 3\left(x^2 + \frac{5x}{36} + \frac{25}{2}\right) - 3x \frac{25}{36}$$

$$\therefore \text{Ans} = \frac{25}{12}$$

47. In the polynomial  $p(x) = x^2 - 10x + 2$  what number should be taken as x to get the least possible number at p(x)?

(1) 10 (2) 5 (3) 0 (4) - 5

**Answer (2)**

**Solution**

$$x^2 - 10x + 2 = x^2 - 10x + 25 - 23 = (x - 5)^2 - 23 \text{ Minimum at } x = 5$$

48. If all real numbers are taken as x, what is the smallest number got as  $|x-1| + |x-2| + |x-4|$ ?  
 (1) 1 (2) 2 (3) 3 (4) 4

**Answer (2)**

**Solution**

$|x-1| + |x-2| + |x-4|$  is minimum at  $x = 2$   
 $\therefore$  Smallest value = 3

49. The areas of two squares are in the ratio a: b and their perimeters are in the ratio b: 8a. What is the ratio of their sides?  
 (1) 1: 8 (2) 1: 4 (3) 1: 2 (4)  $1: \sqrt{2}$

**Answer (3)**

**Solution**

$$\frac{A_1}{A_2} = \frac{a}{b} \text{ \& } \frac{P_1}{P_2} = \frac{b}{8a}$$

$$\Rightarrow \frac{a^2}{a^2} = \frac{a}{b}$$

$$\Rightarrow \frac{a}{b} = \left(\frac{b}{8a}\right)^2$$

$$\Rightarrow \frac{a}{b} = \frac{1}{4}$$

50. The sum of a number and its reciprocal is 4. What is their difference?

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

**Answer (4)**

**Solution**

$$x + \frac{1}{x} = 4$$

$$x - \frac{1}{x} = \sqrt{\left(x + \frac{1}{x}\right)^2 - 4}$$

51. Which of the polygons given below cannot be drawn by joining the numbers on a clock?

- (1) Equilateral triangle (2) Square (3) Regular pentagon (4) Regular hexagon

**Answer (2)**

**Solution**

12 is divisible by 2, 3, & 6 but not by 5 regular pentagon

52. The angles of a cyclic quadrilateral are in one of the ratios given below. Which is it?

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

**Answer (2)**

**Solution**

If ratio of angle are a: b: C: d then a+c must equal to b+d so 2: 1: 3: 4

53. The angles of a 15 –sided polygon are in arithmetic sequence. Which of those given below is an angle of this polygon?

- (1)  $128^\circ$  (2)  $130^\circ$  (3)  $132^\circ$  (4)  $156^\circ$

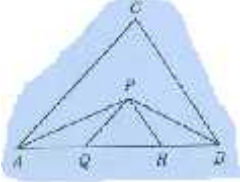
**Answer (4)**

**Solution**

$$\frac{15}{2}(2a + 14d) = 180 \times 13$$

$$\Rightarrow a + 7d = 156$$

54. The bisectors of  $\angle A$  and  $\angle B$  of the triangle ABC meet at P and PQ, PR are parallel to AC and BC



The perimeter of triangle PQR is 30 centimeters. What is the length of AB?

- (1) 20 (2) 25 (3) 30 (4) 45

**Answer (3)**

**Solution**

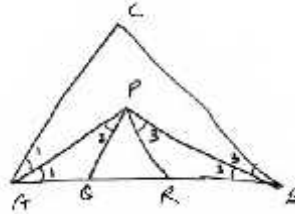
$$PQ \parallel AC$$

$$\Rightarrow \angle 1 = \angle 2$$

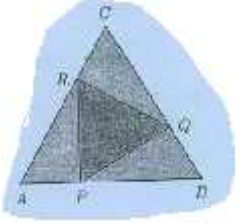
$$\Rightarrow PQ = AQ$$

Similarly,  $PR = BR$

$$\therefore AB = 30$$



55. ABC is an equilateral triangle and the points P, Q, R divided to sides AB, BC, CA in the ratio 1:2



If the area of triangle PQR is 60 square centimeters, what is the area of triangle ABC?

- (1) 180 (2) 150 (3) 120 (4) 90

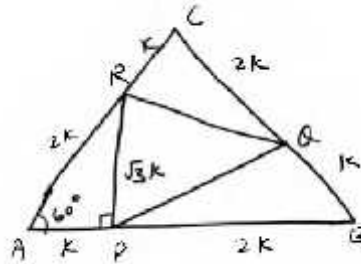
**Answer (1)**

**Solution**

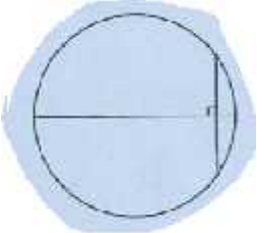
$$\frac{ar\Delta ABC}{ar\Delta PQR} = \left(\frac{AC}{PR}\right)^2$$

$$= \left(\frac{3K}{\sqrt{3}K}\right)^2 = 3$$

$$\therefore ar\Delta ABC = 180$$



56. In the picture, a diameter of the circle and a chord perpendicular to it are drawn



The length of the chord is 24 centimeters and it cuts the diameter in the ratio 9:1. What is the diameter in centimeters?

- (1) 20 (2) 30 (3) 40 (4) 60

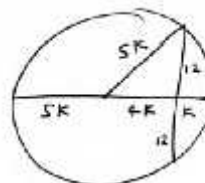
**Answer (3)**

**Solution**

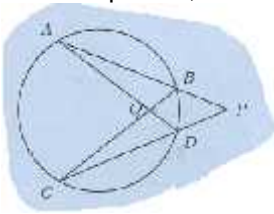
$$3k = 12$$

$$\Rightarrow k = 4$$

$$\Rightarrow \therefore d = 10k = 40$$



57. In the picture, chords AB and CD of the circle are extended to meet at P and the chords AD and BC intersect at Q



The central angle of the smaller arc AC is  $120^\circ$  and the central angle of the smaller arc BC is  $30^\circ$  what are  $\angle APC$  and  $\angle AQC$ ?

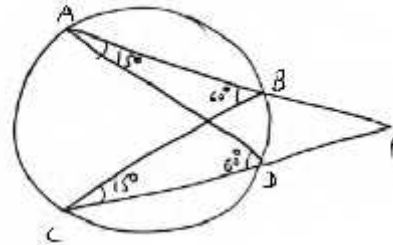
- (1)  $15^\circ, 60^\circ$                       (2)  $45^\circ, 75^\circ$                       (3)  $40^\circ, 80^\circ$                       (4)  $50^\circ, 80^\circ$

**Answer (2)**  
**Solution**

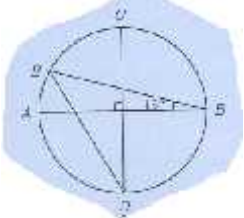
Angle made by AC at circumference

$$\frac{120^\circ}{2} = 60^\circ$$

$\therefore 45^\circ \text{ and } 75^\circ$



58. In the picture, AB and CD are diameters of the circle and E is a point on the circle

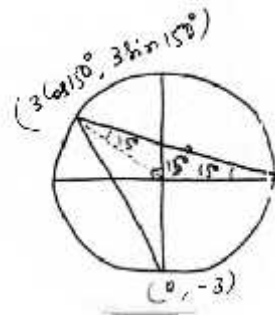


The diameter of the circle is 6 centimeters. What is the length of DE?

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

**Answer (2)**  
**Solution**

$$DE = \text{distance between } (0, -3) \text{ and } \left(\frac{-3\sqrt{3}}{2}, \frac{3}{2}\right)$$



59. An exterior angle of a regular polygon is  $36^\circ$  and one of its longest diagonals is 10 centimeters what is its perimeter?

- (1)  $100 \sin 18^\circ$                       (2)  $100 \sin 36^\circ$                       (3)  $100 \sin 54^\circ$                       (4)  $100 \sin 72^\circ$

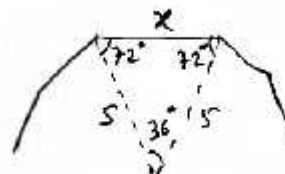
**Answer (2)**  
**Solution**

$$\frac{360^\circ}{n} = 36^\circ$$

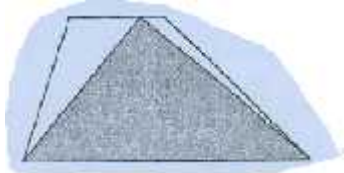
$$\Rightarrow n = 10$$

$$\frac{x}{\sin 36^\circ} = \frac{x}{\sin 72^\circ}$$

$$\Rightarrow x = \frac{5}{2 \cos 36^\circ} = \frac{5}{2} \sin 54^\circ$$



60. In the trapezium shown below, the longer of the parallel sides is three times the shorter



If a point is marked within the trapezium, what is the probability that it would be within the shaded triangle?

(1)  $\frac{1}{2}$

(2)  $\frac{2}{3}$

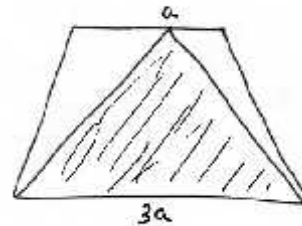
(3)  $\frac{3}{4}$

(4)  $\frac{4}{5}$

**Answer (3)**

**Solution**

$$\frac{\frac{1}{2} \times h \times 3a}{\frac{1}{2} \times h \times (3a + a)} = \frac{3}{4}$$



61. The practice of land grants in India was started by

(1) Cholas

(2) Pandyas

(3) Satavahanas

(4) Gupatas

**Answer (4)**

62. Rearrange chronologically

(a) Fall of Bastille

(3) National Assembly

(1) a b c d

(2) c a b d

(3) b c a d

(4) d a b c

(2) Oath of Tennis court

(d) Execution of Louis X VI

**Answer (3)**

63. Which among the following is the holy book of Buddhism?

(1) Purvas

(2) Angas

(3) Tripitakas

(4) Zend Avesta

**Answer (3)**

64. Which among the following is not correctly matched

(1) Mrichkatikam – Sudraka

(3) Devichandraguptam – Bharavi

(2) Svapnavasavadatta – Bhasa

(4) Dasakumaracharita – Dandi

**Answer (3)**

65. Who among the following was the God of 'Marutam' as recorded in old Tamil literature?

(1) Cheyon

(2) Mayon

(3) Kottavai

(4) Ventan

**Answer (4)**

66. Which is the correct chronological order of the following events?

(a) Quit India Movement

(c) Jallianwala Bagh Tragedy

(1) a b d c

(2) b c a d

(3) c b a d

(4) d c b a

(b) Salt Satyagraha

(d) Naval Mutiny

**Answer (3)**

67. The term 'tithe' stands for

(1) Tax levied by the Church

(2) Tax levied by the state

(3) Tax levied by the feudal lord (4) Tax on animal

**Answer (1)**

68. Mahadandanayaka under the Gupat rule was taking care of  
(1) Revenue (2) Police (3) Judiciary (4) Army

**Answer (3)**

69. Terms 'Zat' and 'Sawar' are related to  
(1) Iqta system (2) Jagirdari system (3) Ryotwari system (4) Mansabdari system

**Answer (4)**

70. 'The Fat Man' was  
(1) An atom bomb (2) A ship (3) A code name of the Gestapo (4) Name of an autobiography

**Answer (1)**

71. Which among the following is connected with the idea of 'Village Autonomy'?  
(1) Shivaji (2) Krishna Deva Raya (3) Chola administration (4) Sultanate of Delhi

**Answer (3)**

72. The film 'Grand Illusion' tells the story of  
(1) The French Revolution (2) The Russian Revolution  
(3) The First World War (4) the Second World War

**Answer (3)**

73. Which among the flowing water ways is considered as National water Way 1?  
(1) The Brahmaputra river between Sadiya and Dhubri  
(2) The West coast canal in Kerala  
(3) The Ganga river between Allahabad and Haldia  
(4) Buckingham canal of Andhra Pradesh

**Answer (3)**

74. The industries which supply their products as raw materials for other industries are called as  
(1) Consumer good industries (2) Basic industries  
(3) Footloose industries (4) Agro – bases industries

**Answer (2)**

75. The finest iron ore with more than 70% iron content is  
(1) Hematite (2) Magnetite (3) Limonite (4) Siderite

**Answer (2)**

76. Manikaran in Himachal Pradesh is known for  
(1) Geo – thermal energy project (2) Thermal power project  
(3) Nuclear energy project (4) Hydro power project

**Answer (1)**

77. Jhumming refers to  
(1) Primitive subsistence farming (2) Commercial farming  
(3) Intensive subsistence farming (4) Dairy farming

**Answer (1)**

78. Identify the terms used to denote the following and choose the correct order from those given  
(i) Species which are in the danger of extinction  
(ii) Species with a small population  
(iii) Species which are found only in some particular areas usually isolated by Geographical barriers  
(iv) Species which are not found after searches in known or likely areas where they may occur  
(1) (i) Rare species (ii) Endangered species (iii) Extinct species (iv) Endemic species  
(2) (i) Endangered species (ii) Rare species (iii) Endemic species (iv) Extinct species  
(3) (i) Endemic species (ii) Extinct species (iii) Endangered species (iv) Rare species  
(4) (i) Extinct species (ii) Endangered species (iii) Endemic species (iv) Rare species

**Answer (2)**

79. Which among the following are considered as international resource?  
(1) Forests (2) Wildlife  
(3) Oceanic resources beyond 200km from the coast of each country (4) All oceanic resources

**Answer (3)**

80. Identify the country which is large then India, in land area, but smaller then Brazil  
(1) Canada (2) USA (3) Australia (4) China

**Answer (3)**

81. In the Northern Plains 'Kankar' formations are common among  
(1) Khadar (2) Bhangar (3) Bhabhar (4) Tarai

**Answer (2)**

82. Match the following and choose the correct combination

- |                      |              |
|----------------------|--------------|
| (a) Malabar Coast    | (i) Paradip  |
| (b) North Circar     | (ii) Chennai |
| (c) Coromandal Coast | (iii) Kochi  |
| (d) Konkan Coast     | (iv) Mumbai  |
- (1) A – i B – ii C – iv D – iii (2) A – i B – ii C – iii D – iv  
(3) A – iv B – iii C – ii D – i (4) A – iii B – i C – ii D – iv

**Answer (4)**

83. One among the following features is not related to river Godavari. Dignify it  
(1) 1500 km in length (2) Originates from mahabaleswar  
(3) Know as Dakshin Ganga (4) the largest peninsular river

**Answer (1)**

84. 'Loo' is a phenomenon in India during  
(1) Hot weather season (2) Cold weather season  
(3) South west monsoon season (4) North east monsoon season

**Answer (1)**

85. Fiscal deficit may lead to  
(a) Increased debt (b) Interest payments obligation  
(c) Current account deficit (d) Capital formation alone  
(1) a, b and c are correct (2) c and d are correct (3) b and c are correct (4) only d is correct

**Answer (2)**

86. Mudra Yojana provides financial assistance to  
(1) Exports only (2) Big industrialists only  
(3) Micro and small entrepreneurs (4) Scientific experiment

**Answer (3)**

87. Stand – up India scheme is promoted by  
(1) SIDBI (2) NABARD (3) SBI (4) RBI

**Answer (1)**

88. Second generation economic reforms means  
(1) Commodity market reforms (2) Reforms introduced in 1991  
(3) Financial sector reforms (4) Reforms in factor and input markets

**Answer (2)**

89. Goods and Service Tax (GST) consists of  
(a) Central GST (b) State GST (c) Interstate GST  
(1) a only (2) b only (3) c only (4) both a and b

**Answer (4)**



90. W.T.O is a
- (1) Multilateral trade negotiation system
  - (2) Bilateral trade negotiation system
  - (3) Forum for trade agreements between LDCs
  - (4) Forum for trade agreements between developed countries

**Answer (1)**

91. Reverse Repo rate is
- (1) Rate at which commercial banks lend to Central Bank
  - (2) Rate at which central banks lend to commercial banks
  - (3) Rate at which governments lands to NBFIs
  - (4) Rate at which governments land to farmers

**Answer (1)**

92. Personal income is estimated by
- (1) Dividing national income by population
  - (2) Adding all factor incomes
  - (3) Adding all factor incomes and transfer payments
  - (4) Adding all factor incomes minus transfer payments

**Answer (3)**

93. The system of power sharing by different groups is known as
- (1) Social Government
  - (2) Community government
  - (3) Local Self Government
  - (4) Coalition Government

**Answer (2)**

94. The Article to the Indian Constitution which deals with the Panchayats
- (1) 246
  - (2) 245
  - (3) 244
  - (4) 243

**Answer (4)**

95. The state in which 'Kittiko – Hachchiko' Movement was started?
- (1) Andhra Pradesh
  - (2) Karnataka
  - (3) Telengana
  - (4) Maharashtra

**Answer (2)**

96. Identify the secular states
- (1) Sri Lanka and India
  - (2) Pakistan and Ireland
  - (3) India and Nepal
  - (4) Britain and Afghanistan

**Answer (3)**

97. Which of following is not a feature of Bureaucracy?
- (1) Permanently appointed
  - (2) Appointed on the basis of qualification
  - (3) Politically not neutral
  - (4) Skilled in their work

**Answer (3)**

98. Few subjects in the Union List, State List and Concurrent List are given below. Identify the concurrent subjects
- |              |               |                     |            |
|--------------|---------------|---------------------|------------|
| (a) Currency | (b) Education | (c) Foreign Affairs | (d) Forest |
| (1) b and d  | (2) a and d   | (3) a and c         | (4) b and  |

**Answer (1)**

99. Apartheid means
- (1) Religious discrimination
  - (2) Communal discrimination
  - (3) Caste discrimination
  - (4) Racial discrimination

**Answer (4)**

100. Which part of the Constitution of India contains Fundamental Duties?
- (1) Part – II
  - (2) Part – III
  - (3) Part – IV
  - (4) Part – IV A

**Answer (2)**