IMPORTANT INSTRUCTIONS

- The maximum marks are 300. Time allotted is **90 MINUTES.**
- There are four sections in the question paper having total **75 questions:**
  - Section – A : Maths (20 Questions)
  - Section – B : Science (20 Questions)
  - Section – C : English (20 Questions)
  - Section – D : Aptitude (15 Questions)
- Each question carries **4 marks.**
- **Negative Marking : ¼ (One-fourth) mark** will be deducted for every incorrect answer.
- **Use only BLUE / BLACK ball pen to fill the circles in bubble sheet.**
- Use of PENCIL is strictly **not allowed.**
- **Do not use marker or white fluid** to hide the mark.

SECTION – A
MATHS

1) What is the value of the expression 7- [13 - {-2-6 (6 of -5)}]?

a) -172 b) 180 c) 172 d) 0

2) Madhavi eats one full bar of chocolate. Then she divides another one into 5 equal parts and eats 3 of them. What is the total number of chocolates that she has eaten?

a) $\frac{4}{5}$ b) $\frac{4}{5}$ c) $\frac{8}{5}$ d) $\frac{8}{10}$

3) The height of 10 students, measured in cm are as follows:
143, 132, *x*, 139, 128, 135, 151, 146, 141, 149.
If mean of the given information is 141.4 cm, then find the value of *x*.

a) 150 cm b) 141 cm c) 142 cm d) 151 cm

4) The number of chapatis needed for 30 students of a class are given in the box.

2, 1, 2, 3, 3, 2, 2, 2, 4, 4, 3, 2, 3, 3, 2, 2, 2, 2, 3, 3, 2, 3, 2, 2, 2, 3, 3, 3, 3, 4

Calculate the mode of the data.

a) 3 b) 2 c) 1 d) 4

5) A number is 3 less than two times the other. If their sum is increased by 7, the result is 37. Find the numbers.

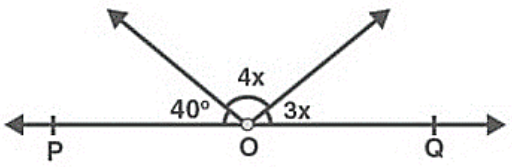
a) 9,11 b) 11,13 c) 11,19 d) 9,13

6) Simplify $\frac{3}{4}x - \frac{2}{5}ax - y + \frac{1}{3}ax - \frac{1}{8}x$ and find its value when a =3, x = (-2) and y = (-6)

a) $5\frac{3}{20}$ b) $3\frac{3}{20}$ c) $\frac{13}{20}$ d) $5\frac{1}{20}$

7) In the given (fig. 1), POQ is a line. The value of x is

a) 20 b) 25
c) 30 d) 35



(fig. 1)

8) Match the following:

Column - I	**Column – II**
(i) $a^2 - b^3$ when a = 3 and b = 2	(a) 0
(ii) $z^3 - 3(z - 10)$ when z = 10	(b) -12
(iii) $x^2 + 2x + 1$ when x = -1	(c) 1000
(iv) 5p – 2 when p = -2	(d) 1

a) (i)-(d), (ii)-(a), (iii)-(b), (iv)-(c) b) (i)-(d), (ii)-(c), (iii)-(b), (iv)-(a)
c) (i)-(a), (ii)-(b), (iii)-(c), (iv)-(d) d) (i)-(d), (ii)-(c), (iii)-(a), (iv)-(b)

9) From the sum of 7x - 2y - 3z and 3x+5y-8z, take away x - 3z, the result will be

a) 9x-3y+8z b) 9x+3y-8z c) 9x+3y+8z d) 9x-3y-8z

10) What percentage is $\left(\frac{25\times4\times63}{7\times6\times9}\right)$ of 750?

a) $3\frac{3}{9}\%$ b) $3\frac{2}{9}\%$ c) $2\frac{3}{9}\%$ d) $2\frac{2}{9}\%$

11) On simplifying $\frac{(16a^2)^{\frac{1}{2}}\times(34a^4)^{\frac{-1}{2}}}{2a^{\frac{1}{2}}\times5a^{\frac{3}{2}}\times8a^{\frac{9}{4}}}$ we get

a) $120\,a^{\frac{25}{4}}$ b) $\frac{1}{120\,a^{\frac{25}{4}}}$ c) $24\,a^{\frac{-25}{4}}$ d) $24\,a^{\frac{25}{4}}$

12) Mr. Tiwari had a piece of land which he distributed among his three children. He gave $\frac{1}{3}$ to his eldest son and $\frac{2}{5}$ of the remaining to his daughter and the left amount of land to his youngest child. How much did his youngest child get, if Mr. Tiwari had 25000 sq m of land?

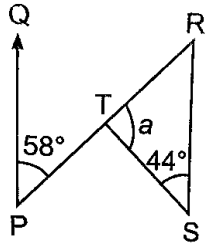
a) 5000 sq m b) 10000 sq m c) 15000 sq m d) 2000 sq m

13) The cost price of a TV set is 48000. It was sold at a profit of 15%. What is the profit earned?

a) 4800 b) 3600 c) 2400 d) 7200

14) In (fig. 2) find the value of a, if PQ||SR

a) 78° b) 80°
c) 76° d) 40°



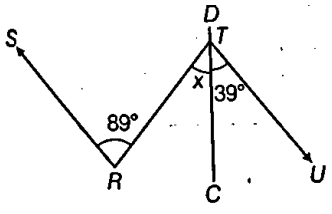
(fig. 2)

15) A vacuum cleaner set costs 154.25 K. Additional pipe costs 15.2 K. What is the total cost of 3 vacuum sets and 5 additional pipes?

a) Rs. 400 b) Rs. 530.75 K c) Rs. 538.75 K d) Rs. 600

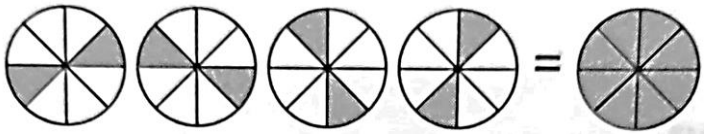
16) In the given (fig. 3), if RS || UT. CD is a straight line, then find the value of ∠RTC.

a) 89° b) 39°
c) 50° d) 49°



(fig. 3)

17) Observe the given (fig. 4) carefully and choose the most suitable options provided below.



(fig. 4)

a) $4 \times \frac{2}{6} = \frac{6}{6}$ b) $4 \times \frac{2}{8} = 1$ c) $2 \times \frac{4}{6} = 1$ d) $2 \times \frac{12}{6} = \frac{8}{8}$

18) Fill in the blanks.

i) 18 men can do a work in 15 days. 6 men can do it in how many days. **A**

ii) If $14^{2n} \times 14^{1-n} = 14^5$, then n = **B**

iii) If $\frac{a+1}{2} + \frac{a}{2} = -2 - 1$, then a = **C**

	A	B	C		A	B	C
a)	-5	4	45 days	b)	45 days	-5	4
c)	45 days	4	-3.5	d)	-5	4	45 days

19) Divide ₹650 among three students P, Q & R in the ratio of 6:9:10. Who among the three got the most?

a) P b) Q c) R d) both P and Q

20) Which of the following options hold the correct answer for the statement 1, 2?

Statement 1 : x=5 is the solution of the 3x+7=22.

Statement 2 : The equation 3x+5=13 represents " 5 more than 3 times a number x gives 13".

a) Both statement 1 and statement 2 are true.
b) Statement 1 is true but statement 2 is false.
c) Both statement 1 and statement 2 are false.
d) Statement 1 is false but statement 2 is true.

SECTION – B
SCIENCE

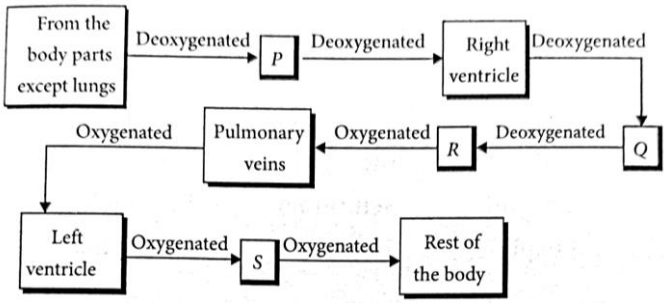
21) Complete the analogy given below: Cuscuta : Parasite : : Rhizopus : X

a) Insectivore b) Symbiotic partner c) Saprophyte d) Lichen

22) The term thermal equilibrium refers to the stage when

a) two liquids are at same temperature
b) all the liquids are at same temperature
c) all the objects involved and the surroundings are at same temperature
d) conduction, convection and radiation all occur simultaneously.

23) Refer to the given flow chart (fig. 5) showing circulation of blood and choose the correct order from the following options.



(fig. 5)

	P	Q	R	S
a)	Aorta	Pulmonary artery	Lungs	Vena cava
d)	Vena cava	Lungs	Pulmonary artery	Aorta
c)	Vena Cava	Pulmonary artery	Lungs	Aorta
d)	Aorta	Lungs	Pulmonary artery	Vena cava

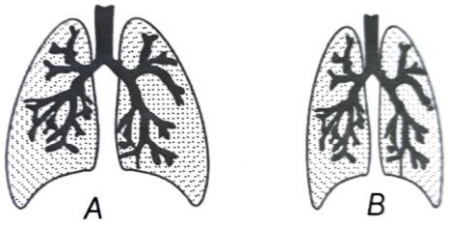
24) Match the salts given in Column I with their formula given in Column II and choose the correct answer using the codes given below:

Column I		Column II	
A.	Limestone	1.	$CuSO_4$ + $5H_2O$
B.	Blue vitriol	2.	$CaSO_4$ + $2H_2O$
C.	Washing soda	3.	$CaCO_3$
D.	Baking soda	4.	$NaHCO_3$
		5.	Na_2CO_3 .$10H_2O$

	A	B	C	D		A	B	C	D
a)	2	1	5	4	b)	3	1	4	5
c)	1	2	5	4	d)	3	1	5	4

25) Refer to the (fig. 6) and select the statement which is incorrect w.r.t figure A and B.

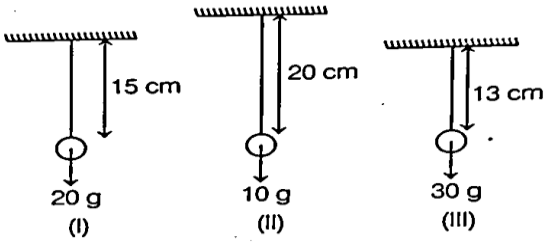
a) Diaphragm becomes flat in A, while dome-shaped in B.
b) Muscles between ribs contract in A but relax in B.
c) Volume of thoracic cavity decreases in A and increases in B.
d) Ribcage moves up and out in A but down and inwards in B.



(fig. 6)

26) The (fig. 7) shows three pendulums of different heights having different weight of bob. Which of the three will have highest time-period?

a) (I)
b) (II)
c) (III)
d) all have same time period



(fig. 7)

27) State (T) for True or (F) for False.

I. The motion of the Earth around the Sun is a uniform motion.
II. The hands of an athlete, while running a race are in periodic motion.
III. The speed 36 km h^{-1} is equivalent to 10 ms^{-1}.
IV. A slower moving object covers a particular distance in shorter time as compared to others.
V. Distance travelled by an object is the product of speed of the object to the time taken.

	I	II	III	IV	V		I	II	III	IV	V
a)	F	T	T	F	T	b)	F	F	T	T	T
c)	T	T	F	F	T	d)	T	F	T	T	T

28) Fill in the blanks.

The simple form of nutrients obtained after digestion gets absorbed in (I) _____. The remaining matter goes into the (II) _____ where an excess of (III) _____ is absorbed. The remaining waste is called (IV) _____ and it is pushed into the rectum where it is stored before leaving the body through the anus.

a) (I) small intestine, (II) rectum, (III) water, (IV) urine
b) (I) stomach, (II) small intestine, (III) nutrients, (IV) faeces
c) (I) large intestine, (II) small intestine, (III) water, (IV) bolus
d) (I) small intestine, (II) large intestine, (III) water, (IV) faeces

29) Look at the (fig. 8) and answer the following question: What are the labelled parts called in an yeast? (plural form)
a) Sponges b) Buds
c) Fragments d) Eyes



(fig. 8)

30) Fill in the blanks:
1. The light material which floats during wastewater treatment is _____.
2. _____ is produced during wastewater treatment.
3. Wastewater from _____ may contain radioactive materials.
a) 1-biogas, 2-Sludge only, 3. rain b) 1-sludge, 2-Biogas, 3. industries
c) 1-sewerage, 2-Scum, 3. houses d) 1-scum, 2-Sludge and biogas, 3. industries

31) Fill in the blanks:
1. Angle between _____ and _____ is called as the angle of reflection.
2. Angle of incidence is always _____ angle of reflection.
a) 1-reflected ray, incident ray, 2-less than b) 1-reflected ray, normal, 2-equal to
c) 1-incident ray, reflected ray, 2-less than d) 1-normal, surface, 2-greater than

32) Various technical terms related to respiratory system of different organisms are hidden in the given word grid in (fig. 9). Identify and choose the most suitable option provided below.
i) Small opening on the sides of the body of an insect.
ii) Respiratory organ of fish.
iii) The opening through which humans inhale air.
iv) Structures present in lungs that are richly supplied with blood vessels and exchange of gases takes palce here.
v) Small pore present on the bark of the stem and helps in gaseous exchange in plants.
vi) A flap-like structure which covers the wind pipe at the time of swallowing in humans.

S	T	E	M	A	N	O
P	Z	M	L	L	C	U
O	A	O	E	V	K	R
R	E	X	N	E	R	M
A	M	Y	T	O	S	Q
C	P	G	I	L	L	V
L	Q	E	C	I	U	P
E	C	N	E	O	N	U
N	S	W	L	O	G	T

(fig. 9)

a) ii) and vi) only b) iv) and v) only c) i) and v) only d) ii) and iv) only

33) Match column I with column II and select the correct option from the codes given.

Column I	Column II
1. Shearing	(a) Washing sheared skin to remove dirt
2. Scouring	(b) Removal of fleece of sheep
3. Sorting	(c) Anthrax
4. Fatal blood disease	(d) Hair of different textures separated

a) 1 – (a), 2 – (b), 3 – (d), 4 – (c) b) 1 – (d), 2 – (a), 3 – (b), 4 – (c)
c) 1 – (b), 2 – (a), 3 – (d), 4 – (c) d) 1 – (c), 2 – (d), 3 – (a), 4 – (b)

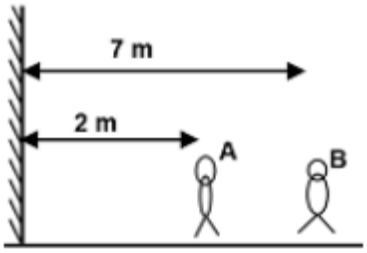
34) Which of the following pairs is/are INCORRECT?

	Name of the acid	**Where it is found?**
P.	Acetic acid	Vinegar
Q.	Citric acid	Orange
R.	Formic acid	Spinach
S.	Oxalic acid	Ant's sting

a) Only P and Q b) Only Q and R c) Only P and S d) Only R and S

35) Two children are standing in front of a plane mirror as shown in (fig. 10). When the child A looks into the mirror, how far away from him will image of child B appear to be?

a) 9m b) 18m
c) 11m d) 16m



(fig. 10)

36) Fill in the blanks:
The water which is lost through the stomata is replaced by water from the _____ vessels in the leaf. Evaporation of water molecules from leaf's cells creates a suction which pulls the water from the _____ cells of the root.

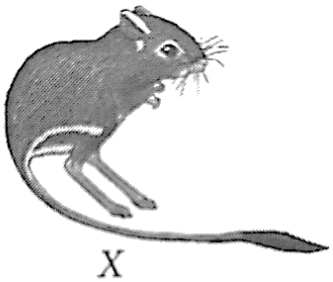
a) xylem, xylem b) xylem, phloem c) phloem, phloem d) phloem, xylem

37) Read the following statements and choose the correct one:
Statement 1: Conduction can happen only if the objects are in contact.
Statement 2: Conduction can happen only if their temperatures are not the same.

a) Only statement 1 b) Only statement 2
c) Both the statements are wrong d) Both the statements are correct

38) Identify animal X from the given (fig. 11) and select the correct statement regarding it.

a) X has flaps in its eyes to avoid entry of dust.
b) X drinks water to fulfill its water requirement, it uses the metabolic water produced in its body by oxidation of food.
c) X has thick layer of fur to protect itself from cold.
d) X has strong claws to dig snow for food.


X
(fig. 11)

39) Fill in the blanks:
1. We should bow down on knees protecting our head and neck using arms to protect ourselves from a _____.
2. The safest place to take shelter when a storm is accompanied by lightning is _____.

a) 1- earthquake, 2-under a tree b) 1-tornado, 2-in a car or a bus
c) 1-hurricane, 2-on a tree d) 1-flood, 2-under a table

40) Look at the (fig. 12) and identify the similarity between them correctly.

a) Both are chemical changes.
b) Both are physical changes.
c) Both show rusting.
d) Both show crystallisation.


(fig. 12)

SECTION – C
ENGLISH

Read the passage given below and answer the questions that follow by selecting the correct option.

Where are the most biologically diverse places on the planet? If I ask you this question, you might guess the Amazon rainforest in Brazil or the jungles of India. But another rich source of **biodiversity** is actually underwater. Off the North Eastern coast of Australia live thousands of species of fish, birds and reptiles. Their home is the Great Barrier Reef, the world's largest coral reef. Stretching over 1600 miles, the Great Barrier Reef is as long as the distance from Boston to Miami in the United States. It covers more than 133000 square miles and it is even visible from outer space. Scientists believe that the reef is around 500000 years old, but it has undergone several transformation during its existence. The reef has most likely its present topology for 6000-8000 years.

The reef may look like a rock, but it's actually alive. Coral reefs are underwater structures that are made by coral – tiny animals that are related to jellyfish. The corals have tender bodies that are vulnerable to attack, so they secrete a hard substance called calcium carbonate to protect their exteriors. The calcium carbonate builds up until it makes formations that look like rocks to the human eye. Coral reefs grow best in warm, shallow, clear water that receives a lot of sunshine. Around a quarter of all marine species live in coral reefs and these reefs play an important role in supporting diversity in the ocean. Charles Darwin, the famous biologist who first proposed the scientific theory of evolution, described the coral reef as an oasis in the desert of the ocean.

Thought tropical waters typically provide very little nutrients, the coral reefs that exist in tropical waters are among the richest and most diverse ecosystem on Earth.

Hundreds of different coral species make up the various structures composing the Great Barrier Reef. Within these structures, several ecosystems flourish. Ecosystems are complex systems that contain several species that interact with one another. The Great Barrier Reef is home to over 1500 species of fish. But it's not just fish that live in the reef. The reef also provides food and shelter to sponges, whales, dolphins, marine turtles and molluscs.

41) The Great Barrier Reef is
   a) a mammal that comes to the ocean's surface to breathe every 7 to 15 minutes.
   b) something that is made out of the same material as human fingernails.
   c) the world's largest coral reef located off the North Eastern coast of Australia.
   d) a large part of the Amazon rainforest located in the country of Brazil.

42) What are coral reefs?
   a) coral reefs are underwater structures
   b) coral reefs are rocks of calcium
   c) coral reefs are small jellyfish type of small animals
   d) a combination of different types of reefs

43) The word in the third line of the first paragraph '**biodiversity**' means
   a) multifariousness b) a variety of different types of plant and animal life
   c) similarity d) identical

44) The antonym of flourish (paragraph 3) is
   a) ornamentation b) thrive c) accomplishment d) flounder

45) The Barrier Reef is a food provider to
   a) sponges b) whales c) dolphins and turtles d) all of these

WORD AND STRUCTURE KNOWLEDGE

46) Arrange the parts sequentially to make a meaningful sentence.
(A) of approximately 40percent of the
(B) the central
(C) part of South America drains an area
(D) the amazon basin that lies in
(E) continent with its perennial rivers
a) DBCAE b) ACBDE c) BEADC d) DAEBC

47) Consider the following statements.
(A) Place like offices, hospitals and universities has restricted the use of mobile phones.
(B) The Traffic Police Department has also restricted its use while driving a motor vehicle.
(C) Still a large number of people do not follow these restrictions.
Which of the following statement/s are grammatically correct?
a) B and C b) A and C c) A and B d) all of these

48) Given below are four alternatives for the idiom underlined in the sentence. Choose the most approriate option.
I will never bet again. I <u>burnt my fingers</u> betting at the Race Course today.
a) suffer for doing something stupid b) burn finger while cooking
c) giving money and not getting it back d) losing money

49) Choose the correct option for the given definitions.
Abranch of study dealing with the behaviour, structure, classification and distribution of animals.
a) Zoology b) Petrology c) Botany d) Physiology

50) Read the following passage and select the option that can correctly replace the respective blanks.
Ancient art forms can be found all **(1)** _____the world . Some well known ancient art can be **(2)** _____in Asian countries like India, China etc **(3)** _____ drawings can be seen in the pottery, walls and buildings. Ancient art forms can also be seen in jewellry, sculptures and weapons. In India, various art forms **(4)** _____like paintings, architecture, sculpture etc. The rock cut paintings of Bhim Betaka and the **(5)** _____ town planning of Harappa and Mohenjo-Daro are remarkable examples of varied art forms.

(1)	a)	in	b)	over	c)	after	d) through
(2)	a)	retrieved	b)	found	c)	originate	d) set up
(3)	a)	attractive	b)	beautiful	c)	popular	d) exotic
(4)	a)	produced	b)	evolved	c)	fabricated	d) manufactured
(5)	a)	proceeded	b)	advanced	c)	processed	d) complex

51) In the question below, the four parts of a sentence are given in jumble form. Select the option so that a meaningful sentence is formed.
A. I had expected
B. the performance of our players
C. worse than
D. was
a) BACD b) BDCA c) DCAB d) CDAB

52) Find the error in the following sentences.
Do you see that funny cloud, shape like a dog's head?
a) dog's b) shape c) a d) like

53) Given below is sentence in Direct Speech. Out of the four options suggested, select the one which best expresses the same sentence in Indirect Speech.
He said to her, "Are you coming to the party"?
a) He told her if she was coming to the party?
b) He asked her if she was coming to the party.
c) He asked her whether she would come to the party.
d) He asked her if she will be coming to the party.

54) Replace the underlined words to complete the sentences in passive voice.
Mr Green <u>is awarded</u> for his commendable service to the university.
a) has been awarded b) was awarded
c) awarded d) have been awarded

55) Choose the correct answer from the given options based on the verb given in brackets.
Keep the food covered or the flies _____ it. (contaminate)
a) contaminates b) contaminated c) contaminate d) will contaminate

56) Fill in the blanks by selecting the most appropriate conjunctions from the options given below.
This old woman spoke _____ English _____ Russian.
a) either, nor b) neither, nor c) only, but d) although, yet

57) Replace the underlined words with the suitable preposition from the given options.
Most people agree <u>at</u> the fact that kindergarten greatly contribute <u>on</u> a child's mental development.
a) to, towards b) in, to c) on, upon d) by, for

58) Fill in the blanks with an appropriate article.
I think there is some butter in _____ fridge.
a) the b) a c) an d) none of these

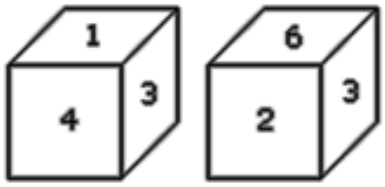
59) Identify the adjectives in the sentences given below.
I am quite fat now but I was much thinner when I was younger.
a) younger, fat b) thinner, younger, fat
c) quite, much, thinner d) thinner, younger, fat, quite, much

60) Fill in the blanks with correct adverbs by choosing from the given options.
The building is leaning _____ . We should _____evacuate it.
a) dangerous, quick b) dangerous, quickly
c) dangerously, quickly d) dangerously, quick

SECTION – D
APTITUDE

61) '20 - 10' means 200, '8 ÷ 4' means 12, '6× 2' means 4 and '12 + 3' means 4, then $100 - 10 \times 1000 \div 1000 \times 10 = ?$
a) 990 b) 0 c) 1900 d) 20

62) In (fig. 13) which will be the number at the bottom, if 5 is at the top?
a) 1 b) 2
c) 3 d) 6



(fig. 13)

63) In certain code, 'BASKET' is written as '5$3%#1'and 'TRIED 'is written as '14*#2. How is 'SKIRT' written in that code?
a) 3%*41 b) 3*%41 c) 3%#41 d) 3#4%1

64) In the following there is same common relationship between the two terms. Find missing term from the given options.

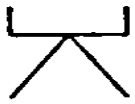
$\sqrt{\text{CBD}}$ = R: $\sqrt{\text{BHI}}$ = Q : : $\sqrt{\text{BEF}}$ = ?

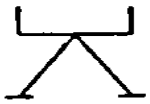
a) P b) S c) T d) N

65) What comes next in the series of figures given (fig. 14, 15, 16, 17)

Question Figures

1)  (fig. 14)

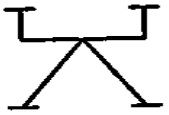
2)  (fig. 15)

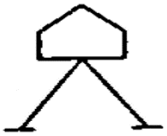
3)  (fig. 16)

4)  (fig. 17)

Answer Figures

a) 

b) 

c) 

d) 

66) A man is facing North. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anticlockwise direction. Which direction is he facing now?

a) South b) North-West c) West d) South-West

67) If L denotes ÷, M denotes ×, P denotes + and Q denotes – , then which of the following statement is true?

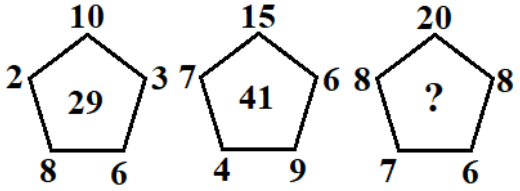
a) $32P8L16Q4 = -\frac{2}{3}$ b) $6M18Q26L13P7 = \frac{173}{13}$

c) $11M34L17Q3 = \frac{38}{3}$ d) $9P9L9Q9M9 = -71$

68) Find the number in (fig. 18) which will replace the question mark (?).

a) 18 b) 49

c) 17 d) 48



(fig. 18)

69) Fill the series P_5QR, P_4QS, P_3QT, _____, P_1QV

a) PQW b) PQV_2 c) P_2QU d) PQ_3U

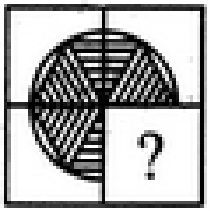
70) If A is the brother of B; B is the sister of C; and C is the father of D, how D is related to A?

a) Brother b) Nephew c) Sister d) Cannot be determined

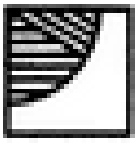
71) What was the day of the week on 28th May, 2006?

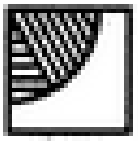
a) Thursday b) Saturday c) Friday d) Sunday

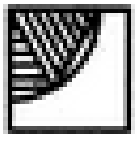
72) Identify the (fig. 19) that completes the pattern.

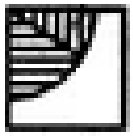


(fig. 19)

a) 

b) 

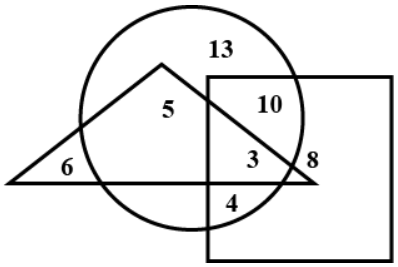
c) 

d) 

73) In the given (fig. 20), square represents women, triangle represents sub-inspectors of police and circle represents graduates. Which numbered area represents graduate women who are sub-inspectors of police.

a) 5 b) 3

c) 8 d) 13

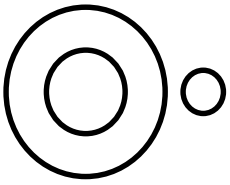


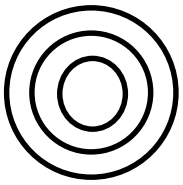
(fig. 20)

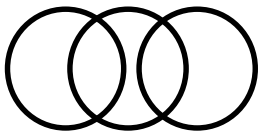
74) Mohit is 16th from the top and twelfth from the bottom in merit in the class. How many students are there in the class?

a) 29 b) 28 c) 27 d) None of these

75) Which of the following Venn diagrams best represents the relationship amongst "Aeroplane, Pilot, Air hostess"?

a) 

b) 

c) 

d) 