**Paper Specific Instructions:**

1. The examination is of 3 hours duration. The Question paper contains two parts, **PART A** and **PART B**. Duration for **PART A is One Hour** and duration for **PART B is Two Hours**. Part B will start only after Part A ends. Part A cannot be attempted after Part B begins.

2. Questions for Part A and Part B will appear on the computer. Answers to Part A have to be entered in the computer. Part A contains **THREE** sections: **Section I, Section II** and **Section III**. Answers to Part B have to be given in the answer book provided by the invigilator.

3. Part A carries a total of 100 marks. Part B also carries a total of 100 marks.

4. Part A, **Section I** (total 20 marks) contains a total of 10 Numerical Answer Type (NAT) questions. For these NAT type questions, the answer is a number that needs to be entered using the virtual keyboard on the monitor. No choices will be shown for these questions. There is NEGATIVE marking for this section. Each correct answer will be awarded 2 marks and each wrong answer will be awarded –0.6 marks. Questions not attempted will result in zero mark.

5. Part A, **Section II** (total 20 marks) contains a total of 10 Multiple Select Questions (MSQ). Each MSQ type question has **one or more correct answer(s)** out of the four given choices. The candidate gets 2 marks **only if** she/he selects all the correct answers. There is NO NEGATIVE or PARTIAL marking for this section.

6. Part A, **Section III** (total 60 marks) contains a total of 30 Multiple Choice Questions (MCQ). Each MCQ type question has four choices out of which **only one** is the correct answer. There is NEGATIVE marking for this section. Each correct answer will be awarded 2 marks and each wrong answer will be awarded –0.6 marks. Questions not attempted will result in zero mark.

7. Part B contains 7 questions. Questions 1, 2 and 3 are **Mandatory** and answer all of them. Questions 4, 5, 6 and 7 are **Optional** and answer only one of them.

8. Charts, graph sheets, tables, calculator, cellular phone and other electronic gadgets are NOT allowed in the examination hall.

9. A scribble pad will be provided for rough work. This has to be returned to the invigilator at the end of the exam.

10. Specific instructions to Part B are given in the answer book.

Part A: Section I. NAT

Q.1 How many types of "flower heads" are there in the visual given below?
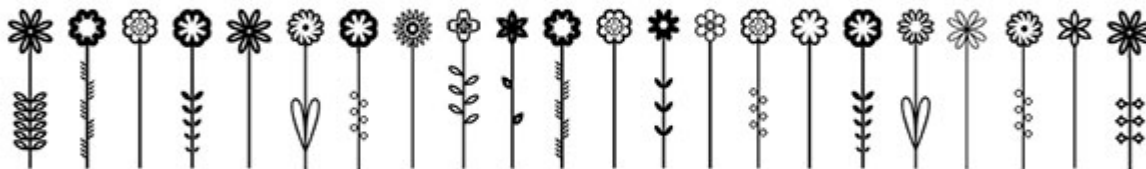

Q.2 How many squares in the given figure?
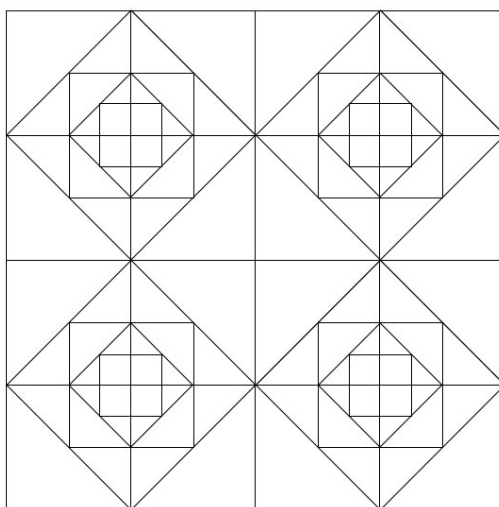
Q.3 A person is cycling home. Due to unexpected water logging, he is forced to take a detour to reach his home. He starts to cycle 5 km towards north, turns right, goes 3 km again turns right goes 2 km then turns left goes 2 km then turns right and goes 3 km then finally turns towards the left and travels 8 km to reach the destination. All the turns he took were in right angles. How many kilometers will he have to travel to the destination if he had cycled in a straight path?

Q.4 Enumerate the number of spelling mistakes in the following paragraph:

It is a cluster of sacred symbls, woven into some sort of ordered whole, which makes up a religous system. For those who are comitted to it, such a religious system seems to medeate geniune knowledge, knowledge of the esential conditions in terms of wich life must, of necesity be lived.

Q.5 Three perspective views of the same solid object are shown below. Count the number of surfaces in the solid object. Assume that the hidden surfaces are flat.
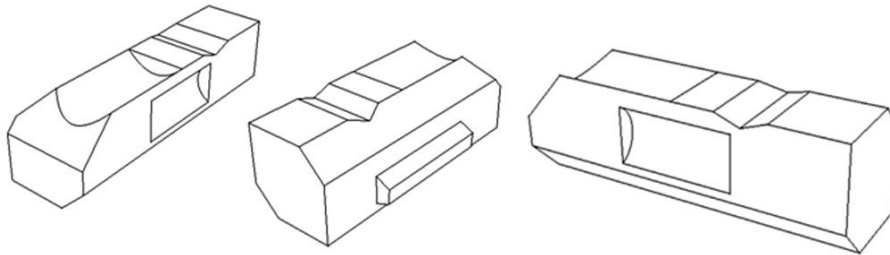

Q.6 Given below ABCDA'B'C'D' is a 4 cm x 4 cm x 4 cm cube. The shape ARDS is a part of the pyramid placed on the cube. Point P is on middle of line segment A'B' and point Q is at the centre of line segment BC. QR = 1 cm is on the line segment TQ, parallel to AB. Point T is at the centre of line segment AD and ST = 4 cm. An ant digs a tunnel through the cube on the path PC and then travels via point Q and R to finally stop at S. What would be the actual length traversed by the ant?
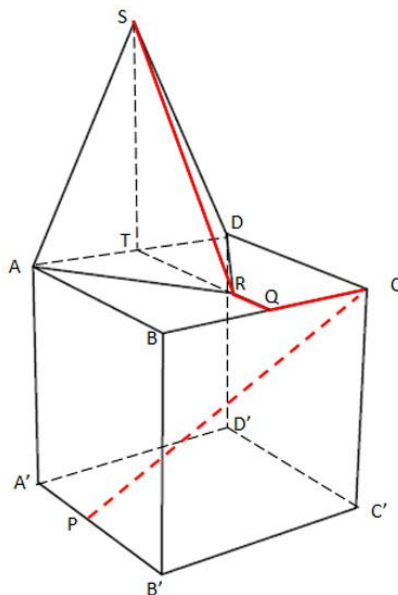

Q.7 A cube of size 10 cm x 10 cm x 10 cm is taken and 2 cm x 2 cm square shaped tunnels are cut through the centres of opposite faces of the cube. Count the number of surfaces in the resulting object.

Q.8 In the visual given below, the diameter of the circle is 12 cm. Find the area of the shaded portion.
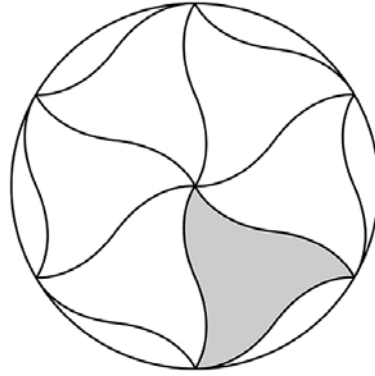
Q.9 What is the maximum number of passport size photographs of size 4 cm x 3 cm that can be printed on an A4 size sheet leaving/excluding one centimetre margin all around the A4 Sheet?

Q.10 The fish given below is 5.5 cm long and 3 cm wide. What is the maximum number of complete fish that can fit in a rectangle of 22cm x 18.5cm without overlapping?
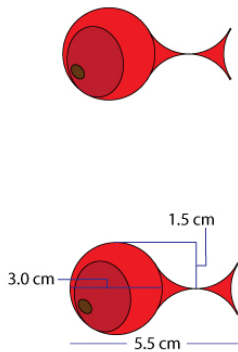
Part A: Section II MSQ

Q.11 Pritam, Sanket, Sunita, Sucheta, Sumeet, and Prashant are design students. These students specialise in one or more areas. The areas in which they specialise are Typography, Photography, and Ergonomics. They are specialised according to the following conditions: Sucheta does not specialise in any area in which Prashant specialises. Prashant specialises in more areas than Sumeet. Exactly three students specialise in Photography. Pritam, Sunita, and exactly two other students specialise in Ergonomics. Prashant specialises in Typography and Photography. Sumeet and Sanket share exactly one area of specialisation which is not Photography.

If Pritam and Sanket specialise in exactly the same areas, then which of the following statement(s) must be TRUE:

   A. Pritam specialises in Typography.
   B. Sucheta specialises in Typography.
   C. Sanket specialises in Ergonomics.
   D. Sumeet does not specialise in Ergonomics.

Q.12 From the list given below, identify the term(s) used in the production process of a non-digital traditional cel animation film.

   I.   Model Sheets
   II.   Storyboard
   III. Animatics
   IV.   Line test
   V.   Ink and Paint
   VI.   Rigging

   A. I, II and IV
   B. III
   C. VI
   D. V

Q.13 Read the following passage carefully and answer the question that follows.

> The most important argument in favour of Bhoja's authorship is the fact that many great writers, who came in the wake of Bhoja, quote these books as Bhoja's in their writings. It is significant that some of these writers who speak of Bhoja's works are not far removed from Bhoja in point in time. The truth possibly lies—as it happens with most such controversies—somewhere in between the two extremes. And it may be expressed by the paradox that Bhoja was and still was not the author of these books. Bhoja was possibly not the author of all these works in the sense that he did not sit down and write them all by himself and also because the compilation of the raw material for his books was done for him, wholly or partly as the case may be, by one or more experts from his versatile coterie. And in the sense that he was the guiding spirit of and provided the entire motive force for the planning as well as the execution of the books, he was de facto creator of the books, though one or more knowledgeable men from his coterie might have executed the plan and done the physical writing part of it.

The following conclusions have been drawn from the passage above. Select the statement(s) that is/are TRUE:

A. The author believes that Bhoja had many knowledgeable men in his coterie who gathered the data and planned for him.
B. The author believes Bhoja physically wrote the books ascribed to him.
C. Some writers who quote Bhoja's writings belong to the same era as Bhoja.
D. Bhoja's thinking and ideas motivated the writing which make him the author of the books.

Q.14   Which of the following statement(s) is/are true?

A.   Pine cones have inspired the design of some climate responsive clothes.
B.   Feet of gecko lizards adhere to a wall just like a velcro.
C.   Management education includes the study of honeycombs.
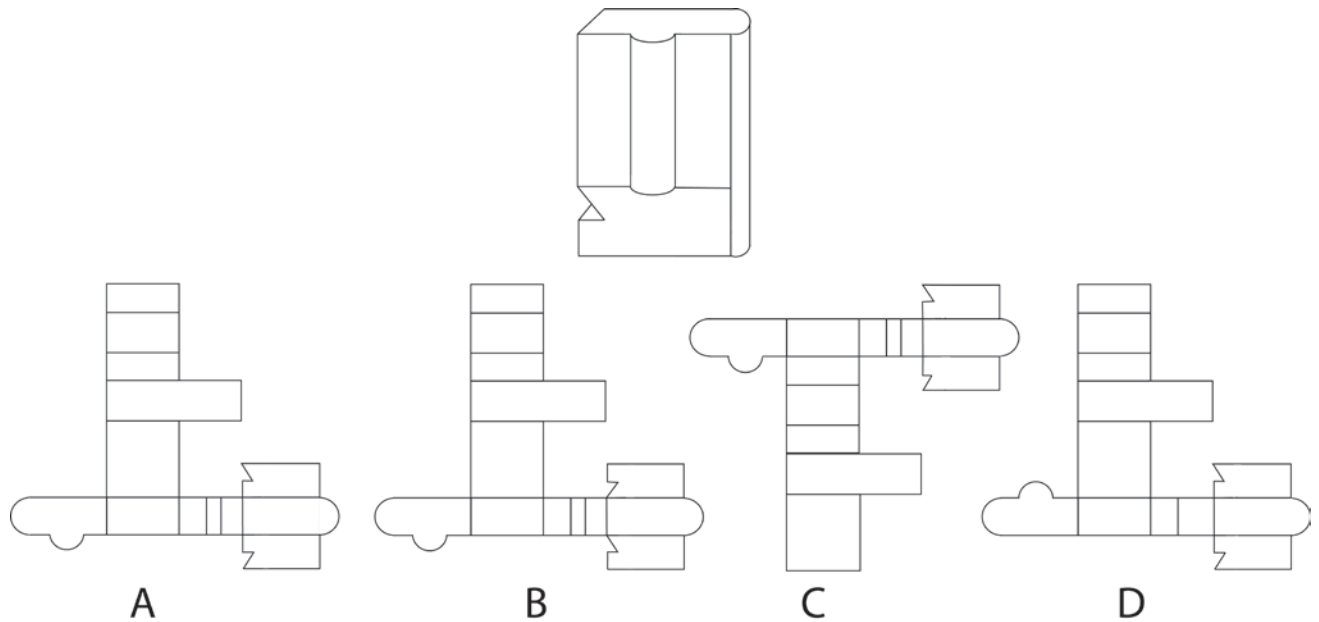D.   Both mobius strip and the recycling logo are cyclic.

Q.15   Which of the following painting(s) is/are made by Rembrandt?

A   B   C   D
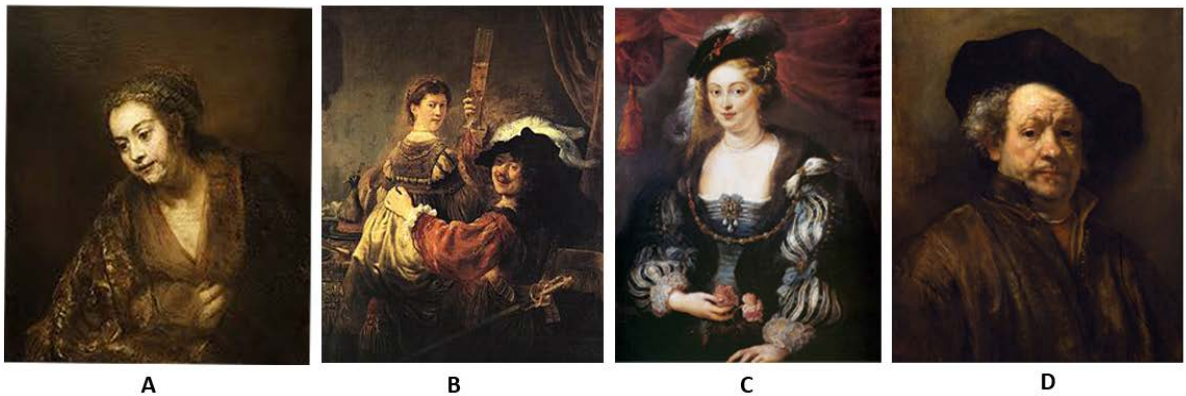
Q.16   An incomplete square is given below. Which of the given set(s) of shapes can complete the square?

A   B   C   D
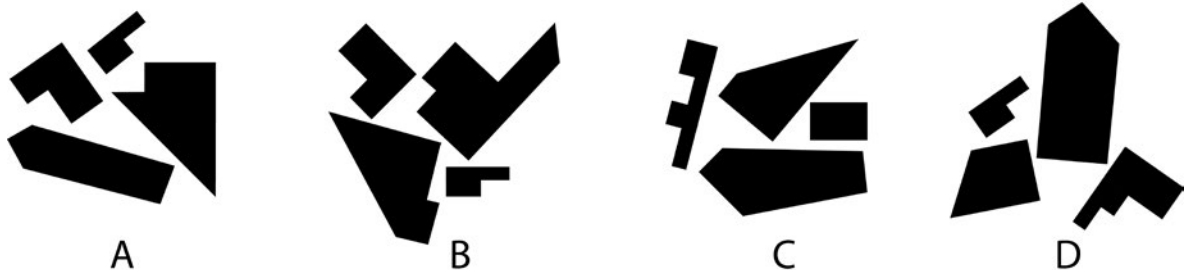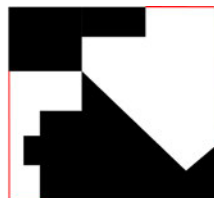
Q.17   Identify which of the option(s) given below can be folded to make the 3D object in the picture shown below.

A   B   C   D

Q.18   Identify which of the term(s) given below is/are used in Photography.

A. Ligatures
B. Bokeh
C. Dodge
D. Contre-Jour

Q.19   Origami folds have influenced the design of space shuttles. Select the characteristic(s) of origami folds which is/are beneficial to space shuttle design.

A. Structural rigidity
B. Tensile structure
C. Expansion-Contraction
D. Economy of space

Q.20   Materials behave differently in contact with water depending upon their properties. Statements given below compare the behaviour of some materials during their contact with water vis-à-vis another material. Identify the correct relationships between the materials.

A. In contact with water, the lotus leaf behaves the same way as a plastic plate.
B. Desert coolers and earthen pots both reduce temperatures in hot and dry weather.
C. Both alum and charcoal use sedimentation to purify water.
D. Bamboo charcoal and silicon powder reduce humidity.

Part A: Section III MCQ

Q.21   The circles given below follow a certain logical sequence. Which of the options would replace the question mark?
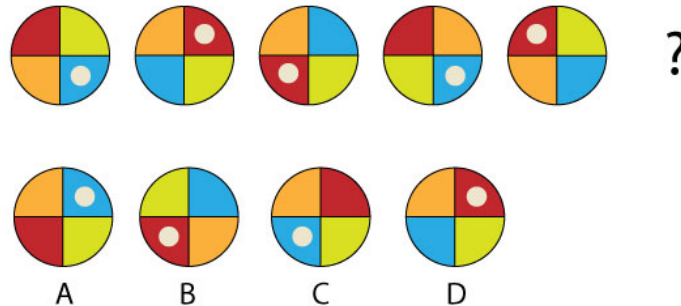
Q.22   A teacher in a school started a new policy for late comers in class. When a student would arrive late, he/she was expected to put 50 rupees in a box. As soon as the policy was put in place, the number of students arriving late reduced drastically. Which of the following statements most closely conforms to the principle that the passage above illustrates?

A. The Government increased the toll charges for cars using the expressway in order to reduce traffic. In spite of this the traffic did not decrease.

B. In a college, a teacher started giving chocolates to all the students who would be in class on time. As a result of this a lot of students started coming on time.

C. The Government decided to impose a fine on individuals when they would cut trees in their bungalow compounds. As a result of this, the number of trees being cut within bungalows reduced considerably.

D. The tax on alcohol was increased in order to generate funds that would be applied to research in alcohol related diseases. This led to significant research developments in alcohol related illnesses.

Q.23
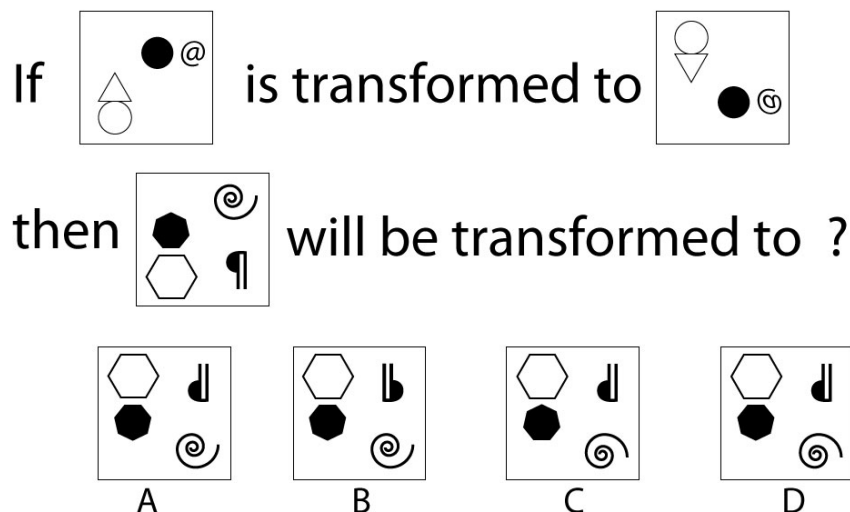
Q.24   Identify the style of the sculpture given below.

A. Maurya Style
B. Gandhara Style
C. Pala Style
D. Kushana Style

Q.25   The following text is from a single paragraph but the lines have got disarranged. Identify the order in which they should be arranged to make complete sense.

I) Earlier much futile thought had been devoted to the question of whether photography is an art. The primary question—whether the very invention of photography had not transformed the entire nature of art—was not raised.

II) Soon the film theoreticians asked the same ill-considered question with regards to film. But the difficulties, which photography caused traditional aesthetics, were mere child's play as compared to those raised by film.

III) When the age of mechanical reproduction separated art from its basis in cult, the semblance of its autonomy disappeared forever. The resulting change in the function of art transcended the perspective of the century; for a long time it even escaped that of the twentieth century, which experienced the development of the film.

IV) The nineteenth century dispute as to the artistic value of painting versus photography today seems devious and confused. This does not diminish its importance, however; if anything, it underlines it. The dispute was in fact the symptom of a historical transformation the universal impact of which was not realized by either of the rivals.

A. I, IV, II, III
B. IV, III, I, II
C. II, I, III, IV
D. III, II, IV, I

Q.26   What is the name of the object shown below?
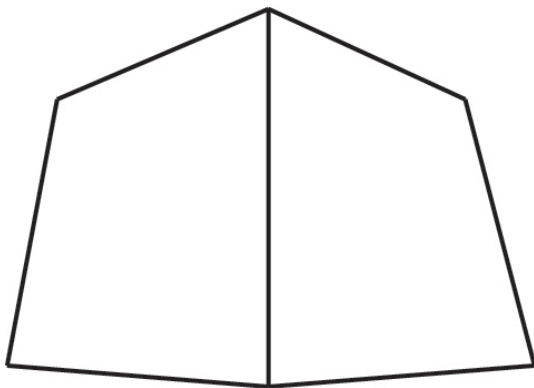

A. Phenakistoscope
B. Zoetrope
C. Thaumatrope
D. Praxinascope

Q.27   Which of these characters is a Disney Cartoon?

A. Daffy Duck
B. Screwball Squirrel
C. Roadrunner
D. Jiminy Cricket

Q.28   The following orthographic view of a 3D object shows

A. One point perspective.
B. Two point perspective.
C. Three point perspective.
D. No perspective.

Q.29   The first flask shown below contains oil and water. Water from the second flask is added to the first flask. On settling, which of the options given below will be the correct result?
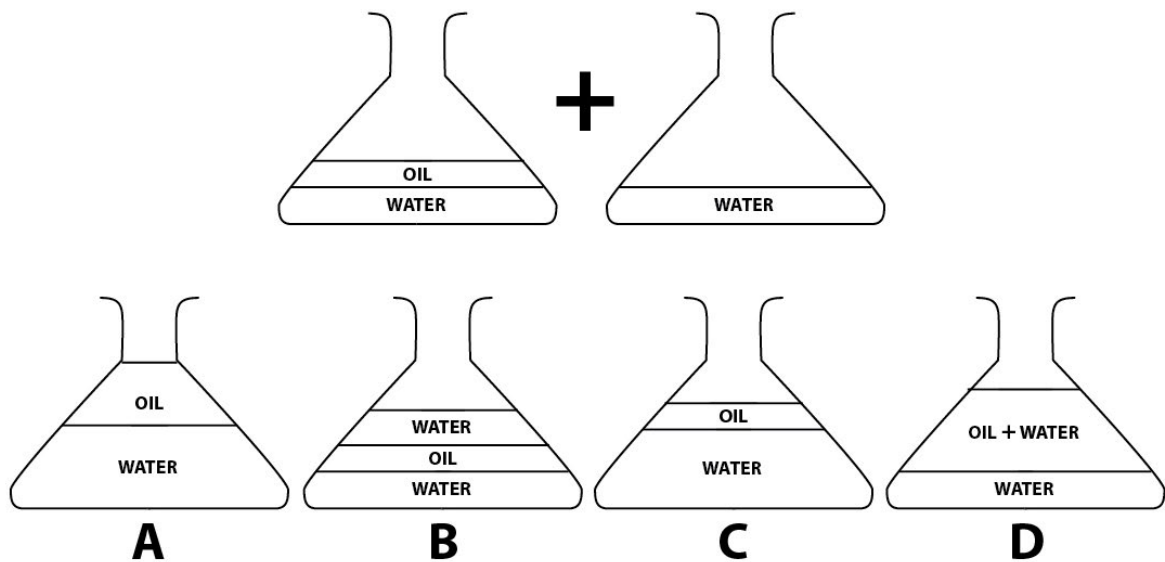
Q.30   Cyan, Magenta and Yellow are which type of primary colours?

A. Additive primaries
B. Psychological primaries
C. Subtractive primaries
D. Harmonic primaries

Q.31   Given below is a poem:

Though there is
none in this floating world
who never suffers,
sad are those who sell themselves
to the boats floating in the port.

Identify the type of poetry.

A. Haiku
B. Limerick
C. Sonnet
D. Waka

Q.32   Different varieties of plastics are listed in P, Q, R, S. Commonly used plastic products are listed in i, ii, iii, iv. Select the most appropriate option which matches the plastics with the products.

P. Polyethylene terephthalate (PET)   i. Detergent bottles
Q. Polyvinyl chloride (PVC)   ii. Compact discs
R. Polycarbonate (PC)   iii. Plumbing pipes and guttering.
S. High-density polyethylene (HDPE)   iv. Carbonated drinks bottles

A. P-ii, Q-iii, R-iv, S-i
B. P-iv, Q-ii, R-iii, S-i
C. P-iv, Q -i, R-iii, S-ii
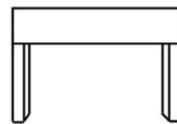D. P-iv, Q -iii, R-ii, S-i

Q.33   You are standing, facing a rectangular table which is 6 ft away from you. The table height is 3 ft. Which of the following views would be most appropriate?
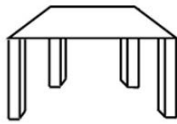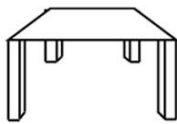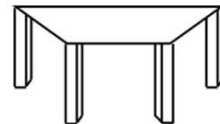

(A)   (B)   (C)   (D)

Q.34   The following is a passage from the autobiography of a famous person, identify the author.

In the year 1934, some of my co-workers in the movement of the depressed classes expressed a desire to go on a sight-seeing tour, if I agreed to join them. I agreed. It was decided that our plan should at all events include a visit to the Buddhist caves at Verul. It was arranged that I should go to Nasik and the party should join me at Nasik. To go to Verul we had to go to Aurangabad. Aurangabad is a town in the Mohammedan State of Hyderabad and is included in the dominion of His Exalted Highness, the Nizam.

A. Vinoba Bhave
B. Mahatma Gandhi
C. B. R. Ambedkar
D. Mohammad Ali Jinnah

Q.35   Shown below on the left are two views of an object. Identify the correct top view from the given choices.
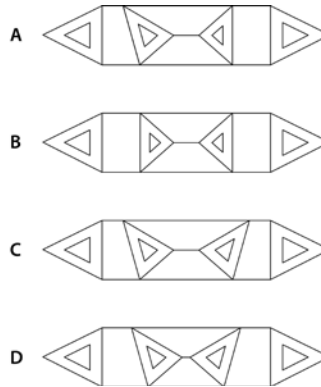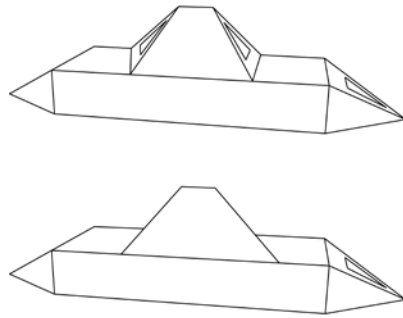
Q.36   Read the passage given below and answer the question that follows.

Visiting small isolated communities up on high plateau in the North East region of Ethiopia, we witnessed this dramatic reality: the lack of potable water. To survive here, women and children walk everyday for miles towards shallow and unprotected ponds, where the water is often contaminated with human and animal waste, parasites, and diseases.

Warka Water towers are an alternative water source for rural population that faces challenges in accessing drinking water. They are estimated to collect up to 26.4 gal (100 L) of drinking water every day. Thirty feet tall vertical structures are designed to harvest potable water from the air. Air always contains some amount of water, irrespective of local ambient temperatures and humidity conditions. This makes it possible to produce water from air almost anywhere in the world.

By which process are Warka Water towers drawing water from the air?

    A. Condensation
    B. Desalination
    C. Conduction
    D. Sublimation

Q.37   The two words shown below use a specific font. From the options, choose the letter which belongs to the same font.

Enclosed prose

a   a   a   a
A   B   C   D

Q.38   In the passage below, identify the four missing words. The boxes below contain possible words for each blank. Choose one word from each box.

When he said that a sociologist should view social phenomenon as 'things' he had in mind the use of statistical material and practical concepts to develop __(i)__. This approach represented a break with the __(ii)__ research that is purely based on understanding. But a naturalistic reduction-whereby social phenomenon are said to have the same ontological status as objects of nature-is not a necessary part of such a statistical- theoretical approach. On the basis of his work with the statistical material on suicide, Durkheim thought that he could explain social solidarity, and determine the causes of the weakening of social solidarity. He called this weakened social solidarity anomie (Greek anomia, no law/norm), that is lawlessness, normlessness. Briefly, a state of anomie represents a weakening of the bonds between people. When anomie develops, individuals become __(iii)__ resistant to pressure and hardship, and the frequency of suicide __(iv)__ .

(i)	(ii)	(iii)	(iv)
research	economic	more	increases
theory	psychological	less	decreases
science	social	unhappily	does not change
knowledge	scientific	naturally	is unmanageable

A. research, psychological, unhappily, is unmanageable
B. theory, social, less, increases
C. science, economic, more, does not change
D. knowledge, scientific, naturally, decreases`

Q.39   Identify the figure which replaces the question mark?
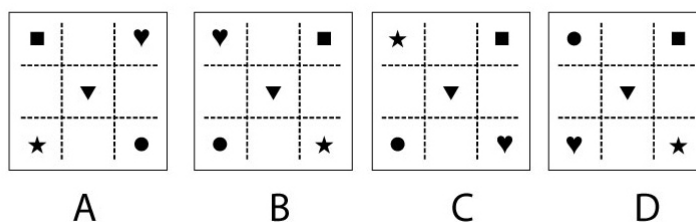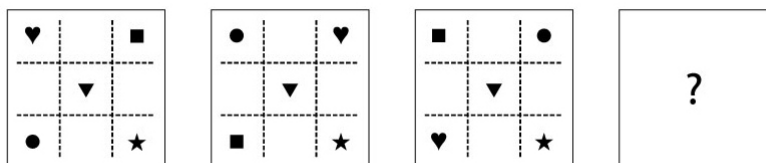
Q.40   A piece of paper is folded according to the sequence shown below and triangular holes are then cut through as shown. What would be the resulting view of the paper when unfolded?

A   B   C   D
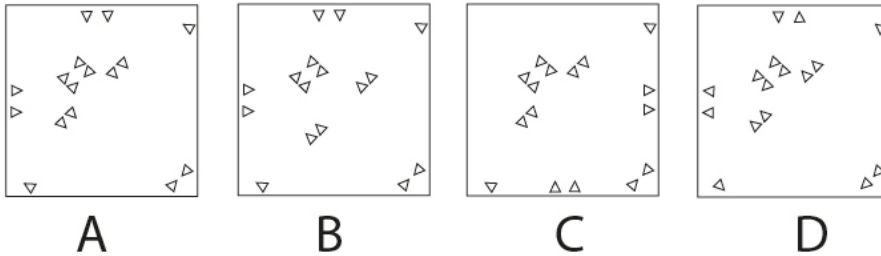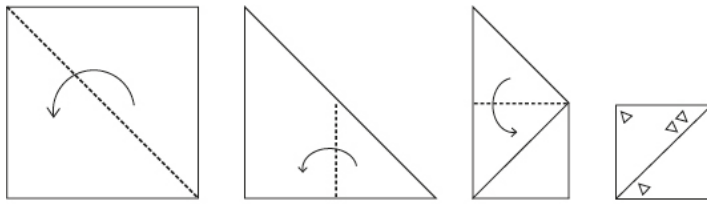
Q.41   Which type of pump is popularly used to circulate the coolant in an automobile engine?

A. diaphragm pump
B. centripetal pump
C. piston pump
D. centrifugal pump

Q.42   Which of the following fonts was designed by Satyajit Ray?

A. Ray Roman
B. Ray Gothic
C. Ray Serif
D. Ray Sans

Q.43   Which interface style is depicted in the wireframes given below?


A. Sequence diagram
B. Wizard
C. Breadcrumbs
D. Flow model

Q.44   A solid stack of equal-sized bricks without any hollow spaces are shown in perspective below. There is one brick at the top of the stack and all bricks are of the same dimension. How many bricks are there in the following stack?
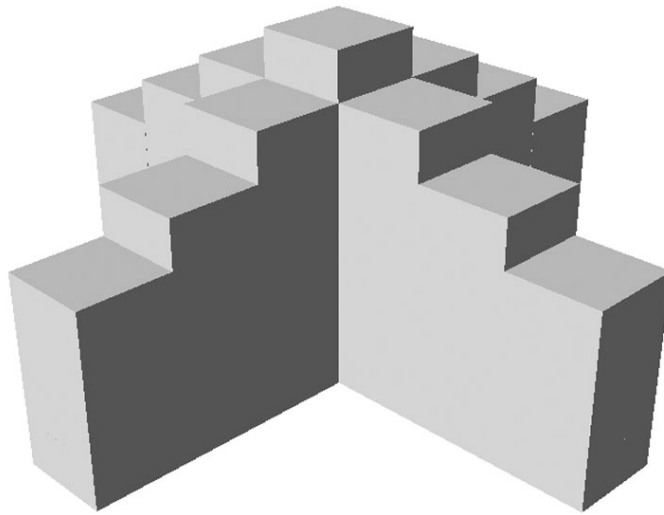
A. 48
B. 52
C. 60
D. 67

Q.45   A squirrel comes running and sits at a spot. Figures below show an animator's rough animation drawings of a squirrel landing just before sitting. What would be the best shape of the tail for the 3rd drawing of the squirrel taking into consideration principles of overlapping and secondary action?


A   B   C   D
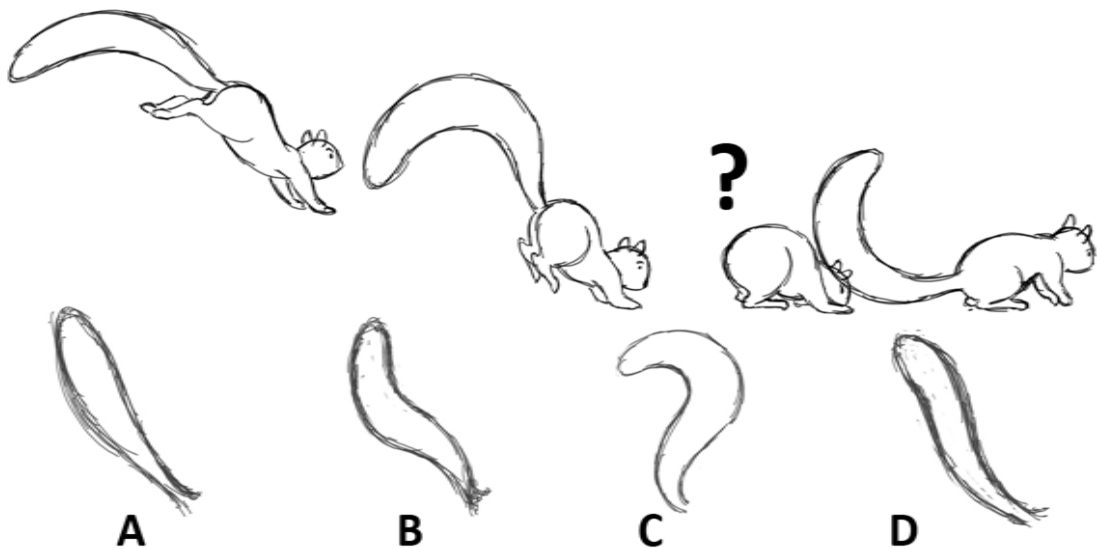
Q.46   Below are the symbols of initiatives supported by Government of India. Identify the option which lists them in the correct sequence.
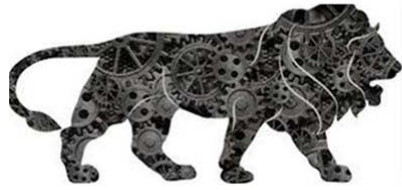

A. Unnat Bharat Abhiyan, National Lion Mission, Dept. of IT, International day for Yoga
B. National Rural Health Mission, Make in India, Digital India, International day for Yoga
C. National Rural Health Mission, Make in India, Dept. of IT, International day for Yoga
D. Unnat Bharat Abhiyan, Make in India, Digital India, National Skill Development Corporation

Q.47   The front view of a building with 3 blocks 1, 2, 3 are shown. Block 1 is 10 floors high. Block 2 has 15 floors and block 3 has 20 floors. In the low angle view of the building shown, what will be the correct height of block 2?
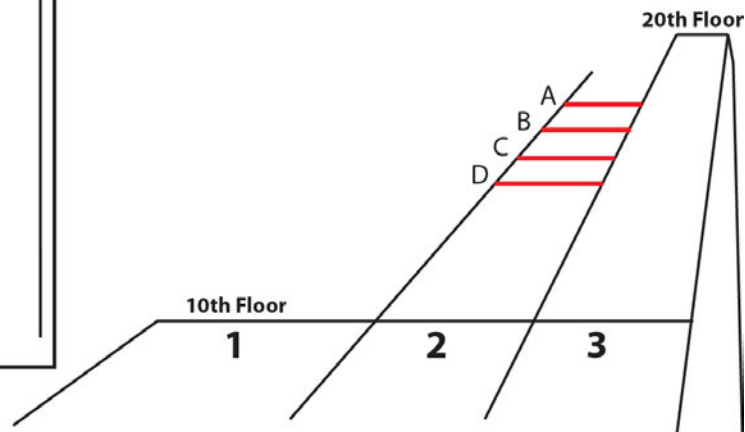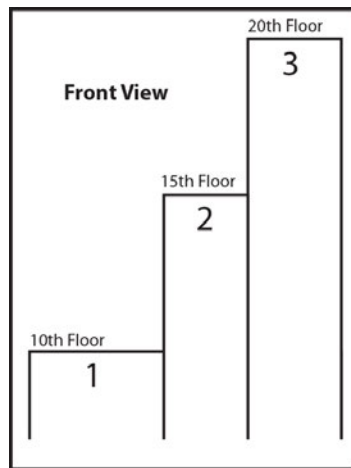

a) A
b) B
c) C
d) D

Q.48   An egg is broken into three pieces. Shown are two of the pieces. Identify the third piece that completes the egg shell.

A   B   C   D
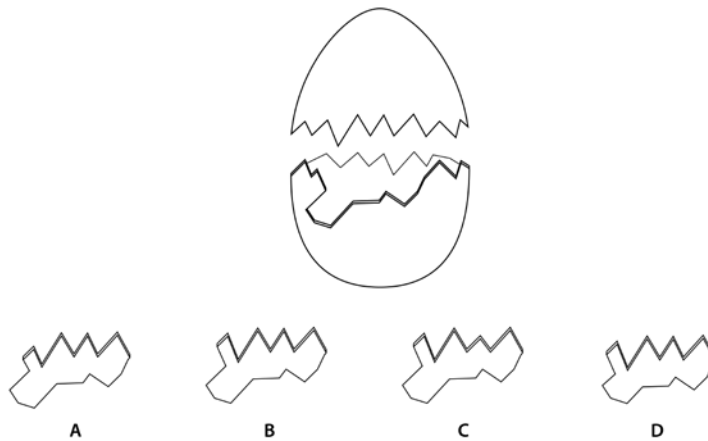
Q.49   The tile shown below is transformed through following sequence: Rotated 45 degree clockwise, flipped vertically, flipped horizontally and again rotated 45 degree clockwise. Identify the orientation of the resultant tile.

A   B   C   D
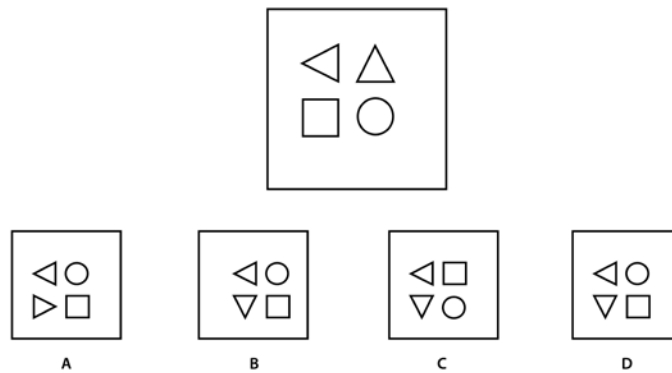
Q.50   Two views of a printed box covering all six sides are shown below. Identify the correct printed sheet used for making the box.

A   B   C   D