

Test Booklet Code

Problem Solving Assessment

No. : 8888888

P1

Sample Question Paper

Class-XI

Time Allowed: Two hours

Maximum Marks: 90

This Test Booklet contains 20 pages. Do not open this Test Booklet until you are asked to do so.

Important Instructions:

01. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on Side-1 and Side-2 carefully with blue/black ball point pen only.

02. The Test Booklet Code for this Test Booklet is P1. The Candidate should check carefully that the Test Booklet Code printed on Side-2 of the Answer Sheet is the same as printed on Test Booklet. In case of discrepancy, the candidate should immediately report the matter to the invigilator for replacement of both the Test Booklet and the Answer Sheet.

03. The Test Booklet contains 60 questions divided into three sections A, B and C. A candidate is required to attempt all the three sections. There are 24 questions in section A, 18 Questions in section B and 18 questions in section C.

Section A : Language Conventions (Question Nos 1 to 24)

To be attempted either from English Language or from Hindi Language

Section B : Qualitative Reasoning (Questions 25 to 42)

Section C : Quantitative Reasoning (Questions 43 to 60)

04. All the three sections contain Multiple Choice Questions (MCQs). Some of these questions are passage based MCQs whereas others are stand alone MCQs. Each of these questions has four options out of which only ONE option is correct. A candidate has to select the correct option and fill the corresponding number in the Answer Sheet against the question.

05. Each Question carries 1 ½ marks. For each correct response, the candidate will get 1 ½ marks. There is no negative marking for any of the questions and unattempted question earns no mark.

06. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet. Cases where a candidate has not signed the Attendance Sheet or the Answer Sheet not handed over to the Invigilator shall be dealt as an Unfair means case.

07. On completion of the test, the candidates MUST HAND OVER THE ANSWER SHEET TO THE INVIGILATOR in the room/hall. The candidates are allowed to take away this Test Booklet with them.

08. Use blue/ black ball point pen only for writing particulars on this page and writing or marking responses on Answer Sheet.

09. The candidates should ensure that the answer sheet is not folded or damaged. Do not make any stray marks on the answer sheet.

10. The candidates are governed by all Rules and Regulations of the Board with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of the Board

Registration No : -----

Candidate's Name : -----

Candidate's Signature : ----- Invigilator's Signature :-----

Section –A (Language Conventions)

Note: This section of the question paper contains 24 questions each in English Language and Hindi Language . A candidate is required to attempt all the 24 questions in one language only (Either in English Language or in Hindi Language)

English Language Questions 1 to 24

(Questions 1 to 8) Read the following passage carefully and select the most suitable option from each list according to the corresponding number in the passage.

1

For Ananya, Mathematics was extremely hard to understand. In order to keep her results high enough to succeed and to satisfy her parents, Ananya attempted a number of strategies. The answer though was simple. She had to work constantly and dilajently at applying the different formulas to a range of contexts. Often she was envious of her peers to whom comprehension came easily. However, at the end of the year, it seemed her relentless work was rewarded when her results put her amongst the leading scholars of her class.

Q 1. Which of these would be the best word to use to replace the word 'extremely' as it is used in the passage above?

- 1) vastly
- 2) mostly
- 3) especially
- 4) massively

Q.2 Which of these is closest in meaning to 'strategies' as used in the passage above?

- 1) rules
- 2) questions
- 3) approaches
- 4) instructions

Q 3. Which of the following could replace 'answer' as used in the passage above?

- 1) reply
- 2) puzzle
- 3) solution
- 4) explanation

Q 4. Which of the following could replace 'though' as used in the passage above?

- 1) yet
- 2) even so
- 3) however
- 4) all the same

Q 5. Which of the following is the correct way to spell 'dilajentley'?

- 1) dilajently
- 2) diligently
- 3) dilejently
- 4) dilegently

Q 6. Which of these is closest in meaning to 'contexts' as used in the passage above?

- 1) ways
- 2) settings
- 3) numbers
- 4) situations

Q 7. Which of the following is closest in meaning to 'was envious of' as used in the passage above?

- 1) was jealous of
- 2) was resentful of
- 3) was bitter towards
- 4) was hostile towards

Q 8. Which of the following is the opposite in meaning to 'rewarded' as used in the passage above?

- 1) forfeited
- 2) punished
- 3) penalised
- 4) disadvantaged

(Questions 9 to 12) This passage contains errors and an omission. Choose the correct option from the lists below to correct these errors and complete the passage.

I entered into the compound, (9)

_____ was surrounded by gloomy stone towers, (10)

and realised I was alone and that I had to fend for yourself. (11)

I had only the clothes on my back and a desired to see my family. (12)

Q9. Which word can be left out of this line without changing its meaning?

- 1) the
- 2) into
- 3) entered
- 4) compound

Q10. Which word correctly completes the sentence?

- 1) that
- 2) what
- 3) which
- 4) whom

Q11. Which word should replace 'yourself'?

- 1) I
- 2) me
- 3) mine
- 4) myself

Q12. Which word correctly replaces 'desired'?

- 1) desire
- 2) desires
- 3) desiring
- 4) desirable

(Questions 13 to 16) Each of the numbered lines given below contains an error. Choose the correct option from the lists below to correct the corresponding error.

Within recent years, experts in Kolkata (13)

had worried about high mercury levels in some fish species. (14)

High mercury levels can be dangerous muscle (15)

weakness and mental and emotional problems
such as depression are common symptoms. (16)

Q 13.

- 1) in
- 2) at
- 3) over
- 3) from

Q 14.

- 1) had become worried
- 2) have became worried
- 3) have become worried
- 4) had increased worrying

Q 15. This line needs:

- 1) a comma after the word dangerous.
- 2) an action word to make it a sentence.
- 3) a comma to link it to the next line to join two clauses together in the sentence.
- 4) a full stop to complete the first sentence and a capital to begin the next sentence

Q 16.

- 1) (such as depression)
- 2) "such as depression"
- 3) such as depression!
- 4) such as – depression

(Questions 17 to 20) Complete this passage by selecting the most suitable word from each list to fill the corresponding gap.

Cosmas Indicopleustes

Cosmas was an ancient Greek merchant who made sea voyages to India . He described and sketched some of what he saw and his works (17) some of the earliest world maps.

He was given the name Indicopleustes, which means “Indian (18)”.

Although there had been trade between the Roman Empire and India from as early as the first (19) BC, Cosmas was one of the few individuals who had actually made the journey himself and, as such, is (20) of this name.

Q 17.

- 1) receive
- 2) contain
- 3) exclude
- 4) subsume

Q 18.

- 1) sailor
- 2) sketcher
- 3) emperor
- 4) merchant

Q 19.

- 1) age
- 2) time
- 3) century
- 4) instance

Q 20.

- 1) proud
- 2) worthy
- 3) boastful
- 4) honoured

(Questions 21 to 24) Complete this passage by selecting the most suitable option from each list to fill the corresponding gap.

The boat trip to Barren Island, (21) home to the only active volcano in India, was not pleasant.

Our battle with the waves (22) with a display of billowing white ash.

We could see remnants of black lava from the recent__(23)____that had spilled down to the water's edge.

Barren Island is a suitable name for the island given that it is home to a __(24)____ of animal inhabitants.

Q 21.

- 1) what is
- 2) which is
- 3) what were
- 4) which were

Q 22.

- 1) is rewarded
- 2) are rewarded
- 3) was rewarded
- 4) were rewarded

Q 23.

- 1) outburst
- 2) eruption
- 3) occasion
- 4) destruction

Q 24.

- 1) limited number
- 2) plentiful supply
- 3) specific quantity
- 4) numerous amount

OR

भाषा (हिंदी) प्रश्न संख्या 1 से 24

निर्देश- निम्नलिखित प्रश्न संख्या 1 से 8 में सबसे सही विकल्प चुनिए-

1. 'राधिका में अदम्य साहस है।' वाक्य में रेखांकित शब्द है-
 - 1) विशेषण
 - 2) प्रविशेषण
 - 3) भाववाचक संज्ञा
 - 4) क्रिया
2. 'उस बच्चे को बुलाओ।' वाक्य में रेखांकित शब्द है-
 - 1) निश्चयवाचक सर्वनाम
 - 2) अनिश्चय वाचक सर्वनाम
 - 3) संकेतवाचक विशेषण
 - 4) सार्वनामिक विशेषण
3. 'मनीष पाँचवीं कक्षा में पढ़ती है।' वाक्य में क्रिया है।
 - 1) सकर्मक
 - 2) अकर्मक
 - 3) प्रेरणार्थक
 - 4) द्विकर्मक
4. 'बच्चे तो गए थे, लेकिन तुम घर पर नहीं थे।' वाक्य में निपात है-
 - 1) थे
 - 2) पर
 - 3) तो
 - 4) नहीं
5. कौन-सा शब्द युग्म बाकी शब्द-युग्मों से भिन्न है -
 - 1) देश-विदेश
 - 2) आकाश-पाताल
 - 3) कंकड़-पत्थर
 - 4) दिन-रात
6. संयुक्त वाक्य का उदाहरण है-
 - 1) जिसने तुम्हारा यह हाल किया है, उसे बुलाओ।
 - 2) स्टेशन आया और मैं उतर गया।
 - 3) स्टेशन आते ही मैं उतर गया।
 - 4) ऐसा हाल करने वाले को बुलाओ।

7. 'दरबार में एक-एक कवि - को सम्मानित किया गया।' वाक्य के रेखांकित शब्द के विपरीत लिंग वाले शब्द से वाक्य पूरा कीजिए -

- 1) लेखिका
- 2) कवयित्री
- 3) विदुषी
- 4) वीरांगना

8. 'वह पेड़ से गिर गया।' वाक्य के रेखांकित अंश कौन-सा कारक है?

- 1) करण
- 2) अपादान
- 3) कर्ता
- 4) संबंध

निर्देश- निम्नलिखित प्रश्न संख्या 9 से 16 में सबसे उचित विकल्प का चयन कीजिए-

9. राम के वनवास जाने पर अयोध्यावासी

- 1) भाव-उत्कृष्ट हो उठे
- 2) भाव-घनीभूत हो उठे
- 3) भाव-विह्वल हो उठे
- 4) भाव-विभोर हो उठे

10. समारोह में यज्ञ की प्रज्वलित की गई।

- 1) आग
- 2) ज्वाला
- 3) अनल
- 4) अग्नि

11. 'अच्छा-अच्छा! बहुत हो गया। अब चुप करो।' वाक्य का रेखांकित अंशअर्थ की ओर संकेत करता है।

- 1) बहुत अच्छा
- 2) स्वीकृति
- 3) खीझना
- 4) रीझना

12. 'बगीचे में अचानक सामने आए साँप को देख राकेश उछल पड़ा।' वाक्य के रेखांकित अंश का अर्थ है-

- 1) खुश होना
- 2) भयभीत होना
- 3) आश्चर्यचकित होना
- 4) विचलित होना

13. सतीश में दूसरों की बात सुनने का धैर्य नहीं है। हमेशा अपनी बात कहता रहता है। इसे कहते हैं-

- 1) अपनी ढपली अपना राग
- 2) अपनी ढपली अपना गान
- 3) अपना गीत अपना साज
- 4) अपनी धुन अपना राग

14. मनुष्य अपने कर्मों से विधि के को बदल सकता है।

- 1) लेख
- 2) विधान
- 3) भाग्य
- (4) विधाता

15. सुरेश बहुत कृतघ्न है। वाक्य में रेखांकित शब्द का अर्थ है-

- 1) उपकार को मानने वाला
- 2) उपकार को न मानने वाला
- 3) उपकार का बदला चुकाने वाला
- 4) उपकार का बदला न चुकाने वाला

16. हमें किसी की नहीं करनी चाहिए।

- 1) अपेक्षा
- 2) निरपेक्षता
- 3) उपेक्षा
- 4) सापेक्षता

निर्देश- नीचे दिए गए अनुच्छेद को पढ़कर प्रश्न संख्या 17 से 24 में उचित विकल्प का चयन कीजिए-
अगर हमें किसी ऐसे (17)..... में जीना पड़े जिसमें (18)..... के बारे में कोई (19)..... हमें मिले ही नहीं, (20)..... क्या हो? अगर हम (21) का हिसाब-किताब ही (22)..... दें तो? कितना ज़रूरी (23)..... है हमारे लिए समय (24)..... ज्ञान? ये कुछ ऐसे रोचक सवाल हैं जिनके जवाब तभी मिल सकते हैं जबकि हमारे पास ऐसा वातावरण उपलब्ध हो जो पूरी तरह से समय के संकेतों से मुक्त हो।

17. 1) स्थान
2) कोठरी
3) माहौल
4) बस्ती

18. 1) मूल्य
2) समय
3) सवाल
4) यहाँ

19. 1) पता
2) खबर
3) निशान
4) संकेत

20. 1) तो
2) पर
3) अर
4) पता

21. 1) जगह
2) समय
3) सबका
4) सभी

22. 1) गायब
2) जोड़
3) खो
4) हटाया

23. 1) वाकई
2) नहीं
3) होते
4) होता

24. 1) का
2) की
3) के
4) पर

Section B (Qualitative Reasoning) Questions 25 to 42

(Questions 25-30) Read the following passage and answer the questions that follow:

David

I spent some time gazing at 'David' inside the Galleria dell'Accademia. It is sculpted from a single block of stone and the grain of the marble so perfectly mimics human flesh that you can almost see the blue veins beneath the statue's 'skin'. Even though the line-up to get in had been quite long, it was worth the wait.

The viewer's feelings about the treasure are not diminished by having seen pictures of it in advance. Photos really can't do the work justice.

Q.25 What knowledge does the reader need to have in order to understand the comment about 'the viewer's feelings'?

- 1) The statue is of a human.
- 2) Michelangelo was the sculptor.
- 3) The statue is considered a masterpiece.
- 4) The Galleria dell'Accademia is in Florence, Italy

Q 26. Which of these sentences would be an accurate summary of the passage?

- 1) 1 'David' draws large crowds.
- 2) 2 'David' deserves its reputation.
- 3) 3 'David' was sculpted from one piece of marble.
- 4) 4 'David' is on display at the Galleria dell' Accademia.

Q. 27 The writer describes 'David' in this passage by

- 1) mentioning the pictures he has seen of it.
- 2) describing the way it is displayed in the gallery.
- 3) focusing on a detail in order to convey an image.
- 4) commenting on the time he spent gazing at the statue.

Q 28 The second sentence shows that the writer appreciates

- 1) the tools used by the sculptor.
- 2) the sculptor's ability to plan ahead.
- 3) the human body as the inspiration for great art.
- 4) the opportunity to view pictures of the sculpture in advance.

Q 29. Which aspect of art does the writer value in this passage?

- 1) realism
- 2) repetition
- 3) abstraction
- 4) symbolism

Q 30. The final sentence expresses an opinion that is most similar to which of the following statements?

- 1) Justice is blind.
- 2) Seeing is believing.
- 3) Believe half of what you see.
- 4) Original is better than restored.

(Questions 31 to 36) Read the following passage and answer the questions that follow:

"Aunt Betsey, there's going to be a new Declaration of Independence."

"Bless and save us, what do you mean, child?" And the startled old lady precipitated a pie into the oven with destructive haste.

"I mean that, being of age, I'm going to take care of myself, and not be a burden any longer. Uncle wishes me out of the way; thinks I ought to go, and, sooner or later, will tell me so. I don't intend to wait for that, but, like the people in fairy tales, travel away into the world and seek my fortune. I know I can find it."

Christie emphasized her speech by energetic demonstrations in the bread-trough, kneading the dough as if it was her destiny, and she was shaping it to suit herself; while Aunt Betsey stood listening, with uplifted pie-fork, and as much astonishment as her placid face was capable of expressing. As the girl paused, with a decided thump, the old lady exclaimed: "What crazy idee you got into your head now?"

Q.31 Christie's reference to 'a new Declaration of Independence' is a reference to

- 1) Uncle's plans to force Christie to leave home.
- 2) Christie's desire to be in control of her own future.
- 3) an upcoming change in the nation's political structures.
- 4) Christie's frustration with Aunt Betsey's expectations of obedience.

Q.32 Aunt Betsey's initial reaction to Christie's announcement is best described as

- 1) angry.
- 2) curious.
- 3) surprised.
- 4) concerned.

Q.33 How does Christie regard fairy tales?

- 1) They provide positive inspiration.
- 2) They are a source of entertainment.
- 3) They contain important moral lessons.
- 4) They present an unrealistic view of the world.

Q.34 The manner in which Christie kneaded the bread emphasised her

- 1) resolve.
- 2) impatience.
- 3) excitement.
- 4) resentment.

Q 35 Judging from the passage as a whole, Aunt Betsey's temperament can be described as being generally

- 1) calm.
- 2) stern.
- 3) nervous.
- 4) depressed.

Q 36 Which of these words best reflects the meaning of the word 'decided' as used in the second to last sentence?

- 1) final
- 2) precise
- 3) focussed
- 4) deliberate

Q.37 Pari tells her friends that she likes French films.

Which of these would best justify her statement?

- 1) She has seen the same French film in four different cinemas.
- 2) She has seen four different French films in the same cinema.
- 3) She has seen four French romance films in four different cinemas.
- 4) She has seen four different French films with the same leading actress

Q.38 Consider the relationship between the following words:

police officer : badge

Which of these word pairs expresses this same relationship?

- 1) cap : nurse
- 2) general: stars
- 3) doctor: syringe
- 4) fire fighter: hose

Portugal's people

Portugal has a population of about 10 million. The population density is greatest in Lisbon the capital, and its suburbs, where about 1.9 million people live. The second largest city in Portugal is Oporto in the north. Generally speaking, there are more people living in the country's coastal regions than in the inland areas.

Q.39 Which of the following graphics would help to clarify the information in this passage?

- 1) diagrams of Portugese regions
- 2) photographs of the cities and people
- 3) a map of Europe with Portugal highlighted
- 4) a pie graph of resident numbers in towns and cities

Q.40 Most people are about as happy as they make their minds up to be."

This quotation says that happiness is

- 1) not able to be accurately measured.
- 2) a difficult decision for some people.
- 3) a result of conscious intellectual effort.
- 4) determined by attitude, not circumstances

Q.41 The statement 'An engine is a part of a car.' can be expressed as *engine : car*.

Which of these word pairs expresses this same relationship?

- 1) building : balcony
- 2) artefact : museum
- 3) geography : mountain
- 4) competition : competitor

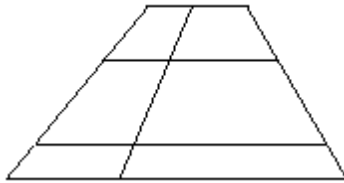
Q.42 Lateral thinking occurs when someone comes up with an unusual way of solving a problem. Raj needs a wrinkle free shirt for an important job interview.

Which of these is an example of Raj using lateral thinking?

- 1) Wear a T-shirt.
- 2) Use his cold, broken, iron.
- 3) Heat a frying pan and use it as an iron.
- 4) Put the shirt on and stretch it with his hands.

Section-C (Quantitative Reasoning) Questions 43 to 60)

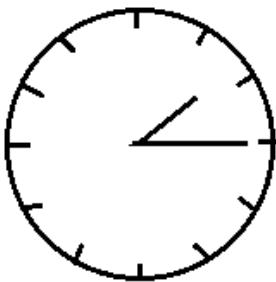
Q. 43 In the diagram below, only the horizontal lines are parallel. There are no other pairs of parallel lines.



How many trapeziums are shown altogether?

- 1) 12
- 2) 16
- 3) 18
- 4) 20

Q.44 Sana likes to wear her watch upside down.



She wants to see a movie that starts in half an hour.

What time does the movie start?

- 1) 13:45
- 2) 18:15
- 3) 19:45
- 4) 20:15

Q.45 Ravi is making a mixture of sand, cement and water. He adds 6 kg of cement and 4 litres of water to every 10 kg of sand.

Which of these statements is **not** correct?

- 1) The water is 20 % of the mixture.
- 2) The ratio of sand to cement to water is 5:2:3.
- 3) To make 30 kg of mixture, Ravi needs 9 kg of cement.
- 4) If he uses 4.5 kg of cement, then he needs 3 L of water.

Q.46 Aarush sat down to study at 8 am. The angle of elevation of the sun was 15° . When he had finished studying the angle of elevation of the sun was 55° .

How long did Aarush study?

- 1) 40 min
- 2) 1 hour 20 mins
- 3) 2 hours 23 mins
- 4) 2 hours 40 mins

Q.47 A pump brings underground water up to ground level. The water flow is measured in litres per minute. This pump fills an 18 litre bucket in 7 seconds.

The pump flow is closest to

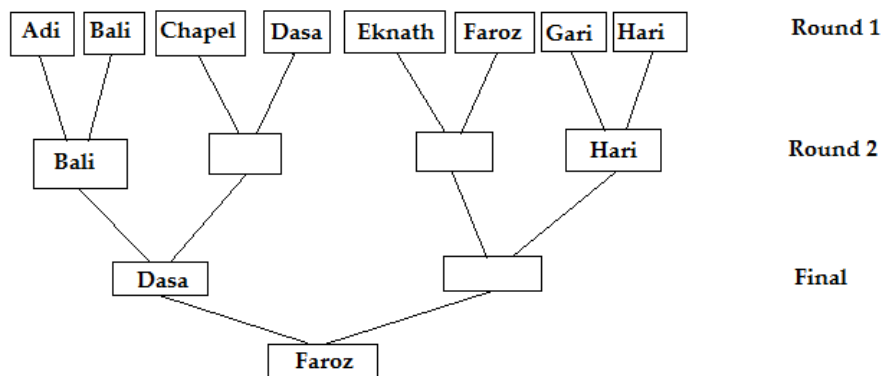
- 1) 23 L/min
- 2) 126 L/min
- 3) 144 L/min
- 4) 150 L/min

Q.48 40 grams of salt is dissolved in 20 litres of water. 10 litres of this solution is then removed and an additional 10 litres of water is added.

The final concentration of salt in the solution is

- 1) 0.5 g/L
- 2) 1 g/L
- 3) 1.33 g/L
- 4) 2 g/L

Q.49 Eight students participated in a knock-out table-tennis competition.



In the first round Adi played Bali and Bali won. Adi was then out of the competition.

Which of these statements is **not** correct?

- 1) Faroz and Dasa played in the final.
- 2) Hari won against Gari and lost to Faroz.
- 3) Dasa won against Chapel and lost to Faroz.
- 4) Bali, Chapel, Faroz and Hari won the first round.

Q.50 One morning Bina downloaded songs from the internet. This increased her collection by 50%. However, in the afternoon a virus destroyed 50% of her total collection.

If Bina's collection then numbered 300 songs, how many did she have at the start of the day?

- 1) 200
- 2) 300
- 3) 400
- 4) 600

Q.51 A triathlon is a race made up of three events; swimming, cycling and running.

In this triathlon, there were three competitors who swam 1 km, cycled 100 km and ran 24 km.

Their approximate average speeds for each event are shown in the following table.

	Swim	Cycle	Run
A	5 km/h	40 km/h	12 km/h
B	2 km/h	50 km/h	10 km/h
C	4 km/h	40 km/h	12 km/h

In which order did A, B and C finish the race?

- 1) A, then B, then C
- 2) B, then A, then C
- 3) C, then B, then A
- 4) A, then C, then B

Q.52 On Tuesday, Rasheed rode to school from his home at an average speed of 12 km/h and arrived 5 minutes late. On Wednesday, Rasheed rode to school from his home at an average speed of 18 km/h and arrived 10 minutes early.

How far does Rasheed live from school?

- 1) 4.2 km
- 2) 8.5 km
- 3) 9 km
- 4) 15 km

(Questions 53-56) Read the following passage and answer the questions as follow:

In a Spin

You have only to watch the daily movement of the sun and the nightly turn of the stars across our sky to realise that the Earth is turning. While you may be standing completely still on the surface of the Earth, that surface is itself turning at a rate of about 1700 km/h. At this rate, our planet takes 23 hours and 56 minutes to make one full rotation on its axis relative to any distant fixed star – a period of time that astronomers call a **sidereal day**. This is a tiny bit shorter than our ordinary **solar day** which is 24 hours long – the time between high noon on two consecutive days. The sidereal and solar days are different lengths because by the time the Earth has made one full rotation on its axis and the distant star is directly overhead again, the Earth has also moved 0.986 degrees further around its nearly

circular orbit around the sun. As a result, at the end of a sidereal day, the Earth must continue to rotate that extra 0.986 degrees until the sun is overhead to complete a solar day. This extra rotation takes 4 minutes.

There are a number of factors that affect the rate at which a planet turns on its axis. Mercury, the closest planet to the sun, rotates much more slowly than Earth because of the dragging effect of the sun's enormous gravity. A solar day on Mercury is the same length as 58 Earth days! Our own Earth's spin is being slowed down by the tidal effect of the Moon and scientists have found that the Earth solar day is getting longer at a rate of 1 second every thousand years.

Q.53 Which of the following statements is true?

- 1) The sun is speeding up the Earth's rate of spin.
- 2) Our clocks use the solar day as it is more convenient.
- 3) The sidereal day is longer than the solar day on Earth.
- 4) All planets in our solar system have the same length of sidereal day.

Q.54 What would happen if the Earth's spin were to slow down?

- 1) Night-time would be longer than daytime.
- 2) The solar day would be shorter than the sidereal day.
- 3) The sidereal day and solar day would both be longer.
- 4) There would be more hours of daylight than hours of darkness.

Q.55 Venus spins in the opposite direction to that in which it orbits the sun, therefore

- 1) its sidereal day is longer than its solar day.
- 2) its solar day is longer than its sidereal day.
- 3) the length of its sidereal day is constantly changing.
- 4) the length of its sidereal day and its solar day are the same.

Q.56 Mercury rotates at a speed of 11 km/h. Therefore the circumference of Mercury is approximately

- 1) 1 550 km.
- 2) 9 200 km.
- 3) 12 100 km.
- 4) 15 600 km.

(Questions 57 to 60) Read the following passage and answer the questions that follow:

Bits and Bytes

While human communication is made up of letters and numbers, the processors within computers and other digital appliances communicate using a system called binary. The *bi* in binary means "two". So the system is based on only using two options: either 0 or 1.

The binary system uses **bits** and **bytes**. Each bit can only have one of two values – either 0 or 1. A byte is a sequence of 8 bits. An average text file is made up of about 100 kilobytes (which is 100 000 bytes or 800 000 bits) while a TV show downloaded from the internet may be many gigabytes (1 000 000 000 bytes) in size!

Computer processors run billions of calculations every second. Each calculation involves converting our normal base 10 numbers which are in combinations of 10 digits, (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) into a binary code, using base 2 numbers, or powers of 2. This results in a sequence of only 0s and 1s as you can see from the table below. This table shows how base 10 numbers are coded into 4 bits. More bits would be needed for bigger numbers.

Base 10 Number	Resulting Binary Code
0	0000
1	0001
2 or (2^1)	0010
3	0011
4 or (2^2)	0100
5	0101
6	0110
7	0111
8 or (2^3)	1000
9	1001
10	1010
11	1011
12	1100

Binary can also be used to encode images for transmission over networks. The simplest versions work by breaking up an image into a series of squares. Squares that are dark are given the value 0 while those that are light are given the value 1. Each row of squares can then be represented by a sequence of bits as shown:

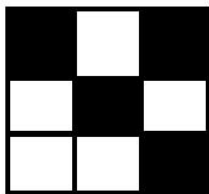


Image
broken into
squares

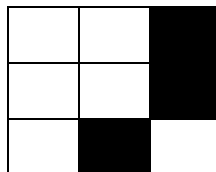
0	1	0
1	0	1
1	1	0

Squares turned into bits

010 101 110

Rows of bits turned into a
sequence with spaces separating
each row's values

Q. 57 What binary sequence would be formed from the image below?



- 1) 110 110 101
- 2) 000 001 110
- 3) 001 001 010
- 4) 111 110 001

Q.58 Using the pattern indicated in the table, what would be the binary code for the integer 13?

- 1) 1101
- 2) 1110
- 3) 1111
- 4) 10001

Q 59. Which of these numbers would be written as 10000 in binary code?

- 1) 14
- 2) 16
- 3) 18
- 4) 20

Q 60. Using binary code, what would be the sum of the binary numbers 0110 and 0101?

- 1) 0211
- 2) 0111
- 3) 1011
- 4) 110101