



CBSE
Class XI
Problem Solving Assessment
Year- 2013

Time: 1 hrs

Total Marks: 90

General Instructions:

1. 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.
2. The candidate should check carefully that the test booklet code printed on Side - 2 of the answer sheet is the same as printed on the 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.
3. The test booklet contains 60 questions divided into three sections Section 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 convention (question 1 to 24) to be attempted either from English language or from Hindi language. Section B: Qualitative Reasoning (question 25 to 42), Section C: Quantitative Reasoning (question 43 to 60).
4. 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.
5. Each question carries one mark. For each correct response, the candidate will get one mark. There is no negative marking for any of the questions and unattempted question earns no mark.
6. On completion of the test, the candidate **MUST HAND OVER THE ANSWER SHEET TO THE INVIGILATOR** in the room/hall. The candidates are allowed to take away the test booklet with them.
7. The candidate should not leave the examination hall without handing over the 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 has not been handed over to the invigilator shall be dealt as an unfair means case.
8. Use blue/black ball point pen only for writing particulars on this page and writing or marking responses on answer sheet.
9. The candidate should ensure that the answer sheet is not folded or damaged. Do not mark 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.



वर्ग - ए (भाषीय आचार : प्रश्न 1 से 24)

परीक्षार्थियों के लिए निर्देश :

1. यह खण्ड उन विद्यार्थियों के लिए है जो भाषीय आचार (Language Conventions) खण्ड के अन्तर्गत हिंदी विषय में परीक्षा देना चाहते हैं।
2. इस खण्ड में कुल 24 वस्तुनिष्ठ प्रश्न हैं। सभी प्रश्न अनिवार्य हैं तथा प्रत्येक प्रश्न एक अंक का है।
3. सभी उत्तर केवल OMR उत्तर पत्र पर ही अंकित करें। उत्तर बदलने हेतु श्वेत रंजक का प्रयोग निषिद्ध है।

निर्देश - निम्नलिखित प्रश्नों (1-8) में प्रत्येक के लिए सबसे सही उत्तर वाले विकल्प चुनिए।

1. 'औद्योगिक' शब्द बना है

- (1) उत् + योग + इक
- (2) औद् + योग + इक
- (3) औ + द्योग + इक
- (4) उद् + योग + इक

2. _____ खाना खा लीजिए। वाक्य में रिक्त स्थान पर आने वाला शब्द है

- (1) तुम
- (2) आप
- (3) तू
- (4) आपको

3. मोनू के लिए मिठाई ले आओ। रेखांकित अंश में कारक बताइए।

- (1) कर्ता कारक
- (2) संबोधन कारक
- (3) संप्रदान कारक
- (4) कर्म कारक

4. 'हमसे नहीं गाया जाता।' वाक्य में कौन-सा वाक्य है?

- (1) कर्तृवाच्य
- (2) कर्मवाच्य
- (3) भाववाच्य
- (4) कर्तावाच्य

5. वर्तनी की दृष्टि से कौन-सा शब्द सही है?

- (1) श्रृगार
- (2) श्रृंगार
- (3) श्रृन्गार
- (4) श्रंगार

6. 'उसने केवल दो सेब खाए।' वाक्य में निपात है

- (1) उसने
- (2) केवल
- (3) दो
- (4) सेब



7. समूहवाचक संज्ञा का उदाहरण है

- (1) विद्यार्थी
- (2) कक्षा
- (3) मैदान
- (4) अध्यापक

8. ठाकुर ने _____ को सब्जी लाकर दी। रेखांकित शब्द के स्त्रीलिंग रूप से वाक्य पूरा कीजिए।

- (1) ठाकुरी
- (2) ठाकुराइन
- (3) ठकुरी
- (4) ठकुराइन

खंड (ब) संदर्भ में शब्दावली

9. तुम मुझे हमेशा परेशान करते हो। मेरे हर काम में _____ हो।' रिक्त स्थान के लिए उपयुक्त मुहावरा है

- (1) रोड़ा अटकाते
- (2) अँगूठा दिखाते
- (3) आँखे फेरते
- (4) कान भरते

10. 'वह अच्छी पुस्तक है।' वाक्य में रेखांकित पद का भेद है

- (1) पुरुषवाचक सर्वनाम
- (2) निश्चयवाचक सर्वनाम
- (3) संबंधवाचक सर्वनाम
- (4) सार्वनामिक विशेषण



11. सुमन के सामने किसी की नहीं चलती। वाक्य में रेखांकित अंश का अर्थ है

- (1) काम बिगड़ना
- (2) कोई काम न करना
- (3) चाल खराब होना
- (4) किसी की बात न मानी जाना

12. खेलों में आजकल क्रिकेट की तूती बोलती है। तूती बोलने से आशय है

- (1) प्रभावित होना
- (2) दबदबा होना
- (3) प्रभामय होना
- (4) चर्चा होना

13. 'यही काल आधारशिला कहा गया है।' वाक्य में रेखांकित शब्द का समानार्थी है

- (1) पल
- (2) क्षण
- (3) समय
- (4) अतीत

14. 'वह कभी तुम्हारा भला नहीं करेगा। उसका कपट किसी को नज़र नहीं आता। वह तो _____ है।' रिक्त स्थान के लिए उपयुक्त मुहावरा है

- (1) ईद का चाँद
- (2) आस्तीन का साँप
- (3) दूध का धुला
- (4) गोबर गणेश



15. वकील साहब की टेढ़ी जिरह का उत्तर देना _____ न था। उपयुक्त शब्द से रिक्त स्थान भरिए

- (1) सजग
- (2) सहज
- (3) स्वाभाविक
- (4) उचित

16. वह अपने साथियों के बीच बहुत _____ है। उचित शब्द से वाक्य पूरा कीजिए।

- (1) अमर
- (2) चर्चा
- (3) तेज़
- (4) चर्चित



NcertHelp
खण्ड (स) गद्यांश पूर्ति कीजिए

नीचे दिए गए अनुच्छेद को पढ़कर प्रश्न संख्या 17 से 24 में उचित विकल्प का चयन कीजिए :

आप मेरी ये कल्पना ___17___ उड़ानें सुनते-सुनते ऊब ___18___ होंगे? पर मुझे ये ___19___ करना बड़ा अच्छा लगता ___20___। आप नहीं जानते कि ___21___ गाँव में अच्छे, समझदार, ___22___ अध्यापक की कितनी ज़रूरत ___23___। हमारे यहाँ रूस में ___24___ के लिए बिल्कुल खास ही तरह की परिस्थितियाँ बनानी चाहिए और ऐसा जल्दी से जल्दी करना चाहिए।



17. रिक्त स्थान 20?

- (1) हैं
- (2) है
- (3) थे
- (4) होगा

18. रिक्त स्थान 17?

- (1) का
- (2) से
- (3) की
- (4) में

19. रिक्त स्थान 18?

- (1) रहे
- (2) रहा
- (3) चुका
- (4) कर

20. रिक्त स्थान 19?

- (1) कहानी
- (2) चापलूसी
- (3) उड़ानें
- (4) बातें





21. रिक्त स्थान 24?

- (1) समझदार
- (2) गरीब
- (3) आदमी
- (4) अध्यापक

22. रिक्त स्थान 21?

- (1) कच्चे
- (2) पक्के
- (3) रूसी
- (4) अच्छे

23. रिक्त स्थान 22?

- (1) शिक्षित
- (2) अशिक्षित
- (3) अमीर
- (4) गरीब

24. रिक्त स्थान 23?

- (1) हैं
- (2) है
- (3) होती
- (4) रही





Section – A (Language Conventions)

Note: This section of the question paper contains 24 questions in the English language. A Student required to attempt all the 24 questions.

(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. On February, 14th , couples around the world celebrate
2. Valentine’s Day. Traditionally, the day comemoraits
3. the death of Saint Valentine, who was ordered
4. to be put to death many centuries ago.
5. Legend has it that the Emperor at the time
6. banned young men from marrying so that they
7. would perform better as soldiers in his army.
8. St. Valentine defied this law and secretly continued
9. to marry couples. Today the day is a chance for
10. people to declare their love; most often by exchanging
11. gifts or caring words

1. Which of these options is closest in meaning to ‘ordered’ as used in line 3?

- (1) Told
- (2) Directed
- (3) Required
- (4) Arranged

2. Which of these options is closest in meaning to ‘celebrate’ as used in line 1?

- (1) Honour
- (2) Have fun on
- (3) Have a holiday on
- (4) Praise the origins of

3. Which of these options is closest in meaning to ‘traditionally’ as used in line 2?

- (1) Actually
- (2) Most often
- (3) Previously
- (4) Historically

4. Which of these options is closest in meaning to ‘defied’ as used in line 8?

- (1) Ignored
- (2) Resisted
- (3) Disobeyed
- (4) Challenged



5. Which of these options is closest to 'perform better' as used in line 7 ?
 - (1) Achieve more
 - (2) Develop better
 - (3) Work together
 - (4) Obey more often

6. Which of these options is closest in meaning to 'declare' as used in line 10?
 - (1) State
 - (2) Share
 - (3) Expose
 - (4) Broadcast

7. Which of the following is the opposite in meaning to the word 'banned' as it is used in line 6 above?
 - (1) Allowed
 - (2) Tolerated
 - (3) Reassured
 - (4) Persuaded

8. Which word is the correct spelling of the word 'comemorait's'?
 - (1) Comemorates
 - (2) Commemorats
 - (3) Commemorates
 - (4) Commemorates

(Question 9 - 12) Complete the passage by selecting the most suitable word/pharse from each list to fill the corresponding gap.

My friend is someone 9 loves animals. She says, "I want to make up 10 the mistreatment of animals that we humans are involved in. " 11 her. " The reason environmental activists sail their small boats around the large whaling ships is 12 they want people to know about the wrongful killing of whales. "

9. Which of these fits gap 12?
 - (1) That
 - (2) Since
 - (3) When
 - (4) So that

10. Which of these fits gap 9?
 - (1) That
 - (2) Who
 - (3) Which
 - (4) Whom



11. Which of these fits gap 10?

- (1) By
- (2) For
- (3) Through
- (4) Because of

12. Which of the fits gap 11?

- (1) Instead of
- (2) In view of
- (3) Apart from
- (4) According to

(Question 13 – 16) Read the passage and select correct from the missing word / phrase to complete it.

The landslide had caused significant disruption to traffic 13 the road through the mountains. Some of the drivers affected by this event had unsuccessfully attempted to move a side one of the huge rocks. 14 members of the emergency team arrived 15 managed to get the road cleared quickly using heavy machinery. The chief engineer told the drivers, 'Even if you 16 harder this large rock would have been impossible to move without special equipment.'

13. Which of these fits gap 16?

- (1) Can try
- (2) Could try
- (3) Had tried
- (4) Have tried

14. Which of these fits gap 13?

- (1) Onto
- (2) Along
- (3) Across
- (4) On top of

15. Which of these fits gap 14?

- (1) As
- (2) Once
- (3) Before
- (4) Although

16. Which of these fits gap 15?

- (1) Who
- (2) They
- (3) These
- (4) Which



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

For years researcher have 17 about why zebras have stripes. Reasons for the unusual pattern of black and white stripes have included confusing predators, camouflaging in grasslands, and allowing zebras to 18 each other in their words, But no one has tested there hypotheses. Its now seems that a new study has found the answer. Zebra stripes disrupt iight patterns that teste flies and horseflies use to find food and water. These insects are 19 pests their feed on the blood of animals 20 lead to the transmission of serious illness.

17. Which of these fits gap 20?

- (1) That can
- (2) And they
- (3) Which can
- (4) Those which

18. Which of these fits gap 17?

- (1) Realized
- (2) Guessed
- (3) Considered
- (4) Speculated

19. Which of these gap 18?

- (1) Meet
- (2) Witness
- (3) Recognize
- (4) Acknowledge

20. Which of these fits gap 19?

- (1) Shameful
- (2) Notorious
- (3) Considerate
- (4) Scandalous



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

At the break of dawn the chatter of birds was replaced___21___ an eerie silence. The temperature dropped and the moon ___22___ the Sun, creating an image if an invisible dragon devouring the Sun. A shadow was cast that was so large that it___23___ the land into darkness. Without warning a commotion of drummers drumming and archers shooting ___24___ arrows into the sky began. The dragon was frightened away and daylight was restored

21. Which of these fits gap 24?

- (1) My
- (2) Our
- (3) Your
- (4) Their

22. Which of these fits gap 21?

- (1) In
- (2) By
- (3) After
- (4) Despite

23. Which of these fits gap 22?

- (1) Overcast
- (2) Obscured
- (3) Overtakes
- (4) Overexposed

24. Which of these fits gap 23?

- (1) Divided
- (2) Plunged
- (3) Lowered
- (4) Collapsed



Section B: Qualitative Reasoning (Questions 25 to 42)

25. A recent increase in cases of Dengue fever has led authorities to introduce a number of measures designed to reduce mosquito numbers.

Which of these strategies would be most successful in reducing numbers this season?

- (1) Conducting research into mosquito life cycles
- (2) Advertising fog machines which kill mosquitoes
- (3) Chemically treating areas hosting mosquito larvae
- (4) Providing more medical supplies to treat dengue patients

26. Consider the relationship between the following words:

encyclopedia : information

Which of these word pairs expresses this same relationship?

- (1) Road : car
- (2) Question : answer
- (3) Internet : computer
- (4) Comedian : entertainment

27. Colours are believed to influence how we think, feel and behave. Studies have shown that people associate certain colours with emotions. When viewed, and being surrounded by a colour, often causes a reaction in people. Designers consider the impact that a colour may have on people's understandings and feelings.

Commonly recognized colour associations include

Blue – trust, cold, sadness

Green – balance, calm, freshness

Purple – leadership, wisdom, intuition

Yellow – happiness, warmth, fun

Red – heat, energy, appetite

Use the above information to answer the following question:

For an anti-bullying poster, the most likely colour choice would be:

- (1) Blue and red
- (2) Green and red
- (3) Green and blue
- (4) Yellow and blue

28. All of the options below could be grouped together. Which one of them could be used as a title for the entire group?

- (1) Solar panels
- (2) Wind turbines
- (3) Power technologies
- (4) Geothermal heat pumps



29. " Are you tired of not knowing where your teenager is? Now you can be sure they are safe all the time! Simply buy the Teen Locator app for your iphone – it's easy to use and the cheapest way to protect your child! "

Which words in the advertisement above are designed to appeal to parents who are frustrated with their actions of their teenage child?

- (1) 'it's easy to use'
- (2) 'protect your child'
- (3) 'be sure they are safe'
- (4) 'tired of not knowing'

30. Idioms are expressions that convey a deeper meaning that goes beyond what is presented
'He let the cat out of the bag

Which of these illustrates a secret?

- 1) He told people everything
- 2) He accidentally revealed a secret
- 3) He let the animal slip from his grasp
- 4) He released the animal from captivity

Questions (31-36) Read the following passage and answer the question that follow

On-line social networking via mobile phones and computers is a global revolution. Around a billion people worldwide use networking to stay in touch with friends, to share videos and photographs and to exchange information. But, if you are using networking in this way, you should be aware of the risks that exist.

Social networking is such that the most of the extensive numbers of users are unknown to you. This carries a degree of risk. Once a message, video or photos has been shared online, it is out of your hands because you can't control where it goes. This means that you may be sharing your personal information with people you do not know and who may not be trustworthy.

Some vital points to consider in order to reduce risks when using social networking include, keeping personal details private, thinking carefully before posting, chatting, uploading or downloading and using privacy settings to restrict strangers accessing your information.

31. The main idea in paragraph three is that there are

- (1) Several good reasons to avoid social networking
- (2) Strangers who spy on the users of social networks
- (3) Safe times when you should use social networking
- (4) Ways to control the sharing of personal information

32. Having your personal information accessed by someone unknown can be compared with

- (1) Talking to strangers in the street
- (2) Sharing your diary entries with a friend
- (3) Inviting unknown people into your house
- (4) People overhearing your confidential conversation



33. The text refers to “the extensive numbers of users” in order to

- (1) Persuade readers to join in
- (2) Indicate social networking to world wide
- (3) Show there are lots of opportunities to make friends
- (4) Suggest that large numbers increase the change of danger

34. Social networking is called a “revolution” because it

- (1) Is a significant change
- (2) Is a political movement
- (3) Revolves around the globe
- (4) Causes conflict across society

35. Which of these sayings summarises the message within this passage?

- (1) Freedom of speech is the noblest right
- (2) Privacy is for people with something to hide
- (3) People have three lives public, private and secret
- (4) If you haven't got anything nice to say, don't say anything

36. Which of these online messages might lead to a social networking user being in a physically dangerous situation?

- (1) Can't wait to see you :)
- (2) See you at Badli station 9 am today, red hat
- (3) Going on holiday with Aunt, Back in a week
- (4) So much fun with best friends at café on weekend :)

Question (37-42) Read the following passage and answer the questions that follow

This story is being told by a lawyer, Jonathan Harker. In this scene he hears of 'Walpurgis night' Some people used to believe that supernatural things happened on this night.

When we said started our drive the sun was shining brightly and the air was full of the joyousness of early summer. Just as we were about to depart, Professor Delbruck came down to the carriage and after wishing me a pleasant drive, said to the coachman Johann, “Remember to be back by nightfall. The sky looks bright but there is shiver in the north wind that says there may be a sudden storm. But I m sure you will not be late,” Here he smiled and added, “for you know what night it is,”

Johann, touching his hat, drove off quickly

When we had cleared the town, I said after signaling to him to stop: “ Tell me, Johann, what is tonight?” he crossed himself as he answered laconically. “Walpurgis night.” Then he took out his watch, a great, old- fashioned silver thing as a big as a turnip and looked at it, with his eyebrows gathered together, I realized that this was his was of respectfully protesting against the unnecessary delay and so I sank back in the carriage, merely motioning him to proceed. He started of rapidly, as if to make up for lost time.

Every now and then the horses seemed to throw up their heads and sniff the air suspiciously.



37. The driver resents the unnecessary delay, but he does not say so. Why not?

- (1) He dislikes Harker
- (2) He wants to be polite
- (3) He is unsure of himself
- (4) He is busy checking the time

38. He crossed himself as he answered laconically "Walpurgis night"

This reply from Johann suggests that 'laconically' means

- (1) Like a lazy person
- (2) With great respect
- (3) Less nervously than usual
- (4) More briefly than expected

39. Professor Delbruck is most concerned that Harker will

- (1) Not be punctual
- (2) Not have a pleasant drive
- (3) Be threatened by a danger
- (4) Be caught in a dangerous storm

40. What time of day was it when the carriage departed?

- (1) Dawn
- (2) Daytime
- (3) Nightfall
- (4) Midnight

41. Professor Delbruck expects a storm because of a "shiver in the north wind" He most likely said this because

- (1) Winds are erratic when storms approach
- (2) The north wind sent a chill down his spine
- (3) He believes that sprites in the air cause storms
- (4) Coldness is signaling the approach of changing weather

42. The author has developed

- (1) Harker's character
- (2) A tension in the plot
- (3) A joyous summer setting
- (4) An atmosphere of calamity



Section C: Quantitative Reasoning (Questions 43 to 60)

43. Tahir and Gagan rode in a 150 km bicycle race. The race was held on a 20 km track. Tahir averaged 30km/h while Gagan averaged 15km/h. How many times did Tahir pass Gagan during the race?
- (1) 2
 - (2) 3
 - (3) 4
 - (4) 5
44. At 8.45 pm Saturdays in Bangalore it is 10.15 am Saturdays in New York. Ravi wishes to ring his friend in New York at 7 am Sunday New York time. Why should Ravi ring from Bangalore?
- (1) 5.00 am Sunday
 - (2) 7.15 am Sunday
 - (3) 5.30 pm Sunday
 - (4) 2.00 am Monday
45. Trout are bred in a tank as fish for restaurants. Twenty trout are caught and each is tagged through tail then released back into the tank. A week later thirty trout are caught and it is found that two of them have a tail tag. Based on this evidence alone, what estimate can be made of the total number of trout in the tank?
- (1) 100
 - (2) 300
 - (3) 600
 - (4) 1200
46. The one Rupee coin weighs 4.85 g. Haji has a 2 kg bag of one Rupee coins. What is the value of this of coins?
- (1) `412
 - (2) `2485
 - (3) `4850
 - (4) `9700
47. Mrs. Ali gave a different number of apples to each of her five children. Any three of her children together received more apples than the remaining two children. What is the least number of apples that Mrs. Ali could have given to one of her children?
- (1) 1
 - (2) 4
 - (3) 5
 - (4) 6



48. Ravi sold his bicycle for ₹1170

This was 10% less than he paid for it

How much did he pay for the bicycle?

- (1) ₹1053
- (2) ₹1180
- (3) ₹1287
- (4) ₹1300

49. Manu pays his rent every 4 weeks

He made his first payment on Friday February 1st 2013

When is his 3rd payment due?

- (1) Friday 29th March 2013
- (2) Friday 1st April 2013
- (3) Friday 27 April 2013
- (4) Friday 1st May 2013

50. Four small boys want to know their weights, but the weighing machine only weighs objects more than 40 kg. As each of the boys knows that his weight is less than this, they weigh themselves two at a time. The results of all possible paired weighings are: 48 kg, 49 kg, 52 kg, 53 kg, 56 kg, and 57 kg.

Mohindra, the tallest of the four boys, weighs the most.

What does he weigh?

- (1) 29 kg
- (2) 30 kg
- (3) 31 kg
- (4) 32 kg

51. Arni bought a piece of timber that is 280 cm long.



←———— 280 cm —————→

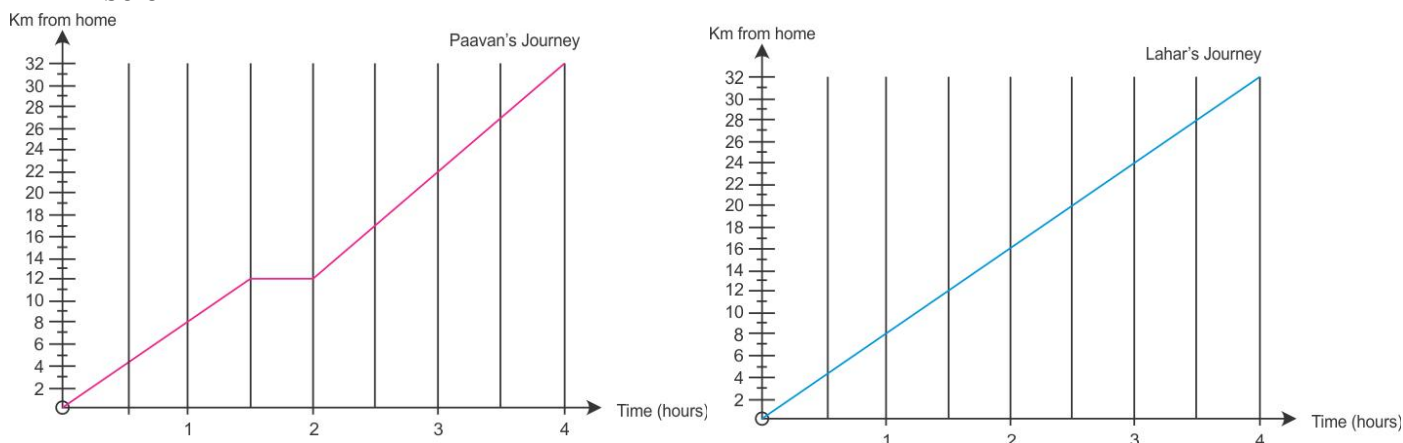
He wants to cut it into two pieces. The shorter piece needs to be 75% of the length of the longer piece

How long will the shorter piece be?

- (1) 70 cm
- (2) 120 cm
- (3) 160 cm
- (4) 210 cm



Paavan and Lahar are friends who have decided to travel to each other's cities, 32 km apart. They both left from their own houses at 8 am, and their predicted journeys are sketched below.



52. At which of following times did Paavan meet Lahar on his journey?

- (1) Between 10.00 and 10.30 am
- (2) Between 10.30 and 11.00 am
- (3) Between 12.00 and 12.30 pm
- (4) Between 2.00 and 2.30 pm

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

All substances, whether they are solids, liquids or gases are made up of particles. The density of a substance depends upon how close together its particles are. Solid substances usually have high densities because their particles are very close together while gases, which have large spaces between their particles, have very low densities. Density can be calculated by dividing the mass (in grams) by its volume (in cubic centimeters). The table below shows the densities of different substances.

Substance	State	Density (g/cm ³)
Air	Gas	0.0012
Helium	Gas	0.00016
Cork	Solid	0.24
Oil	Liquid	0.92
Water	Liquid	1
Steel	Solid	7.8
Lead	Solid	11.3
Mercury	Liquid	13.6

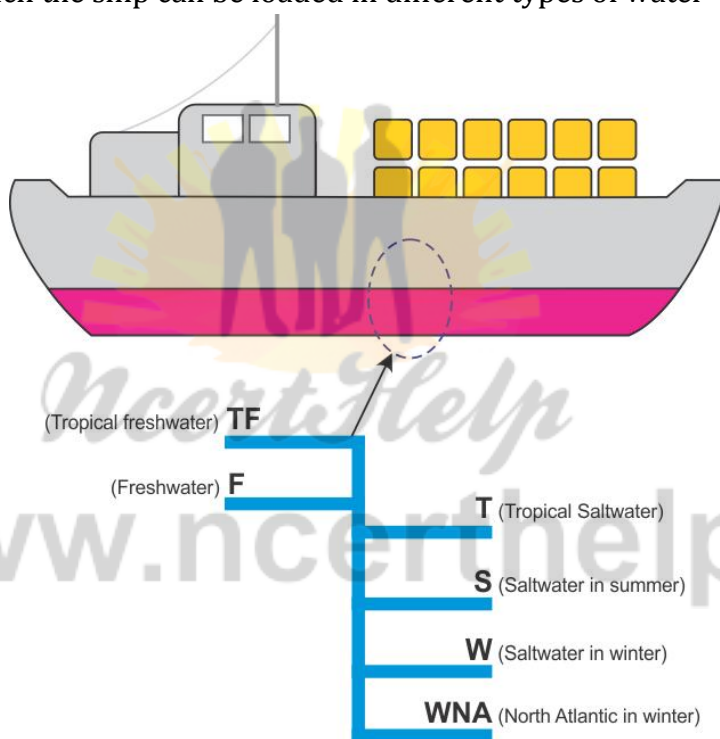
Objects will float in water if they have a density is equal to, or lower than, the density of water. A piece of cork floats in water because cork has a lower density than water. A steel nail, which has a density about 8 times that of water, sinks.



Steel ships are able to float because they are not solid pieces of metal like a nail. A ship's hull is actually a steel shell filled mostly with air which is very light. As a result, the total mass of the ship is very low compared to its volume so it has a smaller average density. This average density is lower than that of water and so the ship floats

As cargo is added to a ship, it sinks lower down into the water. Ships also float at different levels depending on the temperature of the water and whether it is fresh water or sea water. This is because the densities of warm water and cold water are different. The density of salt water is also different to the density of freshwater.

The Plimsoll line shown below is a marking that can be found on the hulls of ships to indicate the safe level to which the ship can be loaded in different types of water



53. Which of the following statements is true?

- (1) Salt water is less dense than fresh water
- (2) Warm water is denser than cool water
- (3) A ship will sit lower in the water in winter than in summer.
- (4) A ship that is loaded in fresh water will rise when it enters an ocean.

54. What is the mass of 1 litre of air

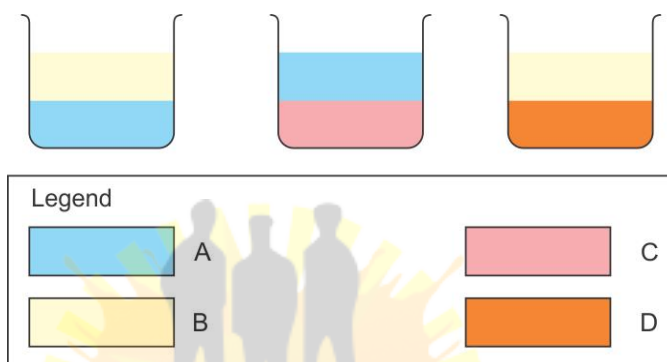
- (1) 1.2 g
- (2) 0.12 g
- (3) 0.0012 g.
- (4) 0.012 kg



55. Why does a ship sink when a large enough hole has been torn in its hull and water enters the ship?

- (1) Its mass and the volume of its hull have increased
- (2) Its mass has decreased and the volume of its hull has increased
- (3) Its mass remains the same but the volume of its hull has increased
- (4) Its mass has increased while the volume of its hull remains the same

Liquids that have different densities form layers. The liquid with the lowest density floats at the top and the densest liquid sinks to the bottom. The diagram below shows 3 containers. Each container holds two different liquids. In total 4 different liquids are shown

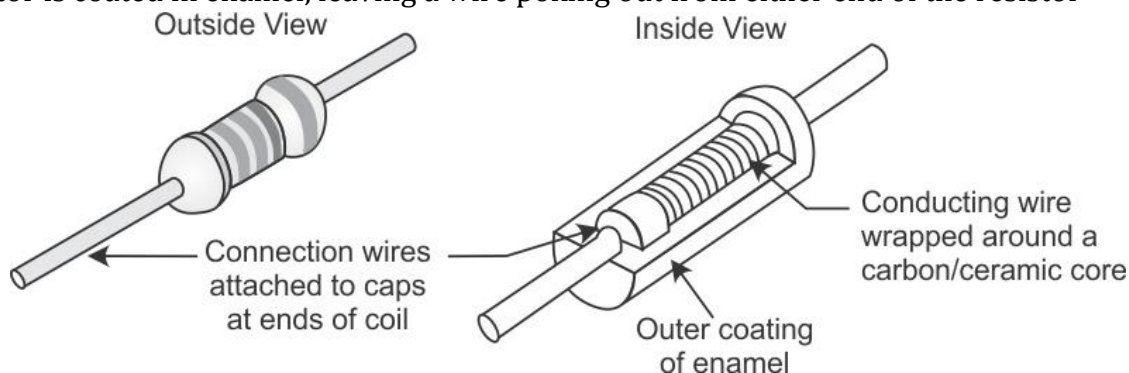


56. This diagram proves that

- (1) Liquid b has the highest density
- (2) Liquid D has the lowest density
- (3) Liquid C has a higher density than B
- (4) Liquid B is more dense than either liquid A and liquid C

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

If you open up nearly any electronic device, you will see many small bead-like components with coloured stripes on them. These components are called resistors and they are used to control the amount of electrical current that flows through different circuit sections in the device. Most resistors have a central core made of a mixture of carbon and ceramic. A wire made of a material such as copper or nichrome is then wrapped around this core. Finally, the resistor is coated in enamel, leaving a wire poking out from either end of the resistor





The degree to which a resistor reduces the size of the current flowing through its branch of the circuit is called its resistance. The resistance value is measured in ohms (written as Ω).

When the resistance is increased, the current that flows through the resistors is proportionally decreased. So a resistor that has a low value of resistance allows a large amount of current to flow through it.

Where two resistors are made of the same material, a long wire will have a higher resistance than a short wire of the same diameter. A very long wire will need to be wrapped around the core many more times than a short wire. This means that the resistance is also directly proportional to the number of coils.

The cross-sectional area of the wire also affects the resistance. The larger the cross-section of the wire, the more easily an electric current can flow through it. In other words, the resistance of the wire is inversely proportional to the area of its cross-section.

Nichrome wire with a 1 mm diameter is called around a 5 cm long carbon core to form a resistor. The diameter of the core is 1 cm and the wire is coiled in such a way that the entire length of the core is covered with only one layer of wire

57. If the resistance of the nichrome wire is 2 per metre, the wire wrapped around the core will have a total resistance that is closet to

- (1) 0.3 Ω
- (2) 3 Ω
- (3) 30 Ω
- (4) 300 Ω

Four resistors are made using carbon cores. The core of each resistor has been wrapped with copper wire but the wires have differing lengths and cross sections as shown in the table below

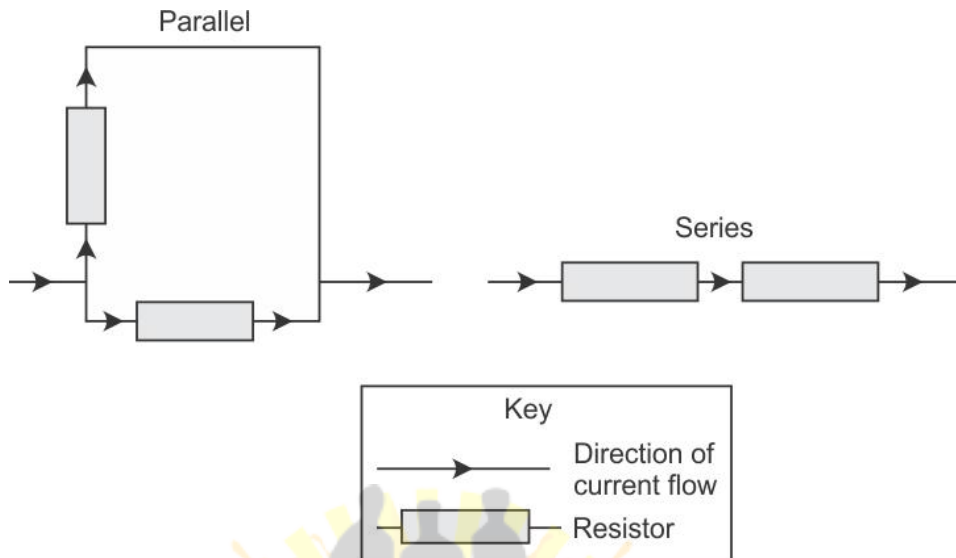
Resistor	Length (cm)	Cross sectional Area (mm^2)
A	10	2
B	20	4
C	30	3
D	40	5

58. Which pair of resistors has the same resistance?

- (1) A and D
- (2) B and C
- (3) A and B
- (4) B and D

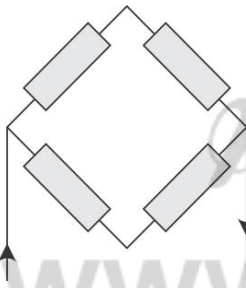


When resistors are connected in series, the electrical current passes through them one after another. When they are connected in parallel, the current splits to travel through them at the same time.

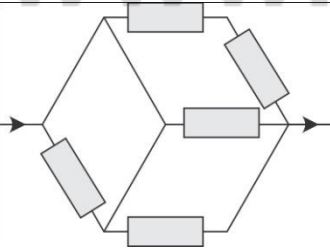


59. Which one of the diagrams below shows All of the resistors in parallel with each other?

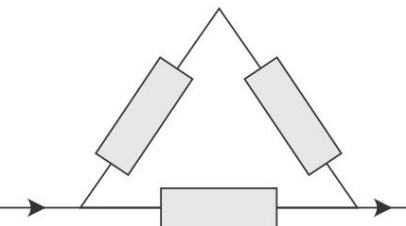
(1)



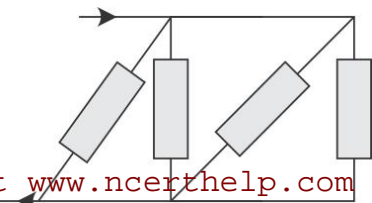
(2)



(3)

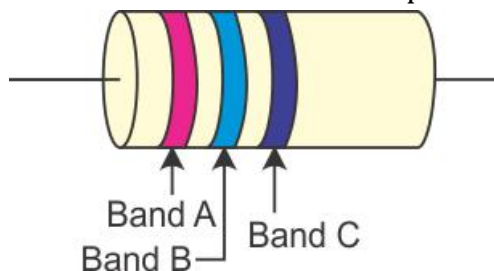


(4)





Some resistors are too small to have their value printed on them numerically. Instead, they have their resistance value coded as a series of coloured bands painted around their ends. Each colour stands for a different number or multiplier as shown to the table below.



Band colour	Band value	Band A	Band B	Band C	multiplier
Black	0		0		1
Brown	10		1		10
Red	20		2		100
Orange	30		3		1000
Yellow	40		4		10,000
Green	50		5		100,00
Blue	60		6		1000000
Violet	70		7		10000000
Grey	80		8		100000000
White	90		9		1000000000
Gold					0.1
Silver					00.1

For example a resistor marked with brown, blue and yellow bands would have a value of $(10+6) \times 10,000 = 160000 \Omega$

60. In order, what are the colours of the bands of the new resistor?

- (1) Black, yellow and gold
- (2) Brown, green and black
- (3) Orange, violet and green
- (4) Brown, yellow and black