

Parmar SSC Live Mock 15 May,2025

<p>Q. 1</p> <p>Select the most appropriate meaning of the underlined idiom in the given sentence. The invigilator did not know that the two boys were exchanging notes <u>under his nose</u>.</p> <p>a) written in small letters <input checked="" type="checkbox"/> X</p> <p>b) rolled into small pellets <input checked="" type="checkbox"/> X</p> <p>c) wrapped in handkerchiefs <input checked="" type="checkbox"/> X</p> <p>d) right in front of him <input checked="" type="checkbox"/> ✓</p>	
<p>Explanation:</p> <p>Correct answer: Option D. right in front of him The idiom "under his nose" means something happening openly or directly in front of someone without them noticing it.</p>	
<p>Q. 2</p> <p>Choose the most appropriate synonym of the given word Fuse</p> <p>a) Correct <input checked="" type="checkbox"/> X</p> <p>b) Unused <input checked="" type="checkbox"/> X</p> <p>c) Break <input checked="" type="checkbox"/> X</p> <p>d) Combine <input checked="" type="checkbox"/> ✓</p>	<p>Correct answer: Option D. Combine</p> <ul style="list-style-type: none"> ● "fuse" means to join or blend two or more things together into one. ● Combine – Means to bring or mix two or more things together. (Synonym) <p>Other options:</p> <ul style="list-style-type: none"> ● Unused – Means not used or not yet utilized. ● Correct – Means to make something right or accurate. ● Break – Means to separate into pieces or destroy.

Q. 3	<p>Choose the most appropriate antonym of the given word Illuminate</p> <p>a) Add  b) Erase  c) Light  d) Darken </p>
Explanation:	<p>Correct answer: Option D. Darken</p> <ul style="list-style-type: none">• "Illuminate" means to light up or make something brighter.• Darken – Means to make darker or reduce light. (opposite of "illuminate.") <p>Other options:</p> <ol style="list-style-type: none">1. Add – Means to include or increase.2. Erase – Means to remove, unrelated to light or brightness.
Q. 4	<p>Choose the most appropriate synonym of the given word Attribute</p> <p>a) Respect  b) Speech  c) Praise  d) Quality </p>
Explanation:	<p>Correct answer: Option D. Quality</p> <ul style="list-style-type: none">• "attribute" (when used as a noun) refers to a characteristic or quality of someone or something.• Quality – Means a distinguishing feature or trait. (synonym of "attribute.") <p>Other option:</p> <ol style="list-style-type: none">1. Respect – Means admiration, not the same as "attribute."2. Speech – Means spoken words.3. Praise – Means appreciation.

<p>Q. 5</p> <p>Choose the most appropriate antonym for the given word.</p> <p>Deficit</p> <p>a) Adhere X</p> <p>b) Credit X</p> <p>c) Surplus ✓</p> <p>d) Remove X</p>	<p>Explanation:</p> <p>Correct answer: Option C. Surplus</p> <ul style="list-style-type: none"> • "Deficit" means a shortage or lack, especially in terms of money or resources. • Surplus – Means an excess or more than what is needed. (antonym of "deficit.") <p>Other options:</p> <ol style="list-style-type: none"> 1. Adhere – Means to stick or follow something. 2. Credit – Can be related to finances. 3. Remove – Means to take away.
<p>Q. 6</p> <p>Given below are four jumbled sentences. Pick the option that gives their correct order.</p> <p>A. The home then was a bungalow, single storied and bounded by walls.</p> <p>B. He states that in the early 1950's houses in most cities relied on the bungalow model.</p> <p>C. According to Gautam Bhatia, a leading architect we need to bring about a radical change in our model of housing.</p> <p>D. Sadly, nearly 70years later after a 100-fold increase in city population, density and land value we still persist on the same outmoded model.</p> <p>a) CBAD ✓</p> <p>b) CDAB X</p> <p>c) DBAC X</p> <p>d) CDBA X</p>	<p>Explanation:</p> <p>Correct answer: Option A. CBAD</p> <ol style="list-style-type: none"> 1. C introduces the main subject – Gautam Bhatia and his view on housing models. 2. B supports C with historical context from the 1950s. 3. A describes what those old houses looked like. 4. D concludes with the problem – that we still use the same outdated model today. <p>Correct sequence: C (intro) → B (historical context) → A (description) → D (present-day issue)</p>

Q. 7

Given below are four jumbled sentences. Pick the option that gives their correct order.

- A. But today adults as well as a growing number of young parents are cutting down on intake of sugar.
- B. Until about two decades ago, becoming careful about sugar was only for diabetics.
- C. Thus going zero on sugar is fast becoming a popular trend for all.
- D. Before joining this trend doctors advise that we all need to find out whether all sugars are harmful.

a) BACD ✓

b) CDAB ✗

c) ABDC ✗

d) DBAC ✗

Explanation:

Correct answer: Option A. BACD

1. **B** sets the background – only diabetics used to avoid sugar.
2. **A** shows the shift – now even non-diabetics, including young parents, are avoiding sugar.
3. **C** explains the result – avoiding sugar is now a trend.
4. **D** gives a concluding caution – doctors suggest checking which sugars are harmful before following the trend.

Sequence: B (past) → A (present shift) → C (trend) → D (advice)

Q. 8

Select the most appropriate word for the given sentence

To express in an unclear way

a) Eloquent ✗

b) Garbled ✓

c) Lucid ✗

d) Intelligible ✗

Explanation:

Correct answer: Option B. Garbled

1. **Eloquent** – Fluent and persuasive in speaking or writing.
2. **Garbled** – Confused or distorted; expressed in an unclear or jumbled way (**Correct**).
3. **Lucid** – Clear and easy to understand.
4. **Intelligible** – Able to be understood.

Q. 9	<p>Identify the best way to improve the underlined part of the given sentence. If there is no improvement required, select 'No improvement'.</p> <p>Please switch on all the lights in the room <u>as it's getting</u> very dark now.</p> <p>a) as it were getting X</p> <p>b) No improvement ✓</p> <p>c) as it was getting X</p> <p>d) when it will get X</p>
Explanation:	<p>Correct answer: Option B. No improvement</p> <ul style="list-style-type: none"> • "it's" is the contraction of "it is", and "is getting" is present continuous tense, which matches the current situation ("now").

Q. 10	<p>Find out the INCORRECTLY spelt word.</p> <p>a) Immediate X</p> <p>b) Lliterate ✓</p> <p>c) Implement X</p> <p>d) Illogical X</p>
Explanation:	<p>Correct answer: Option B. Lliterate</p> <ul style="list-style-type: none"> • Lliterate – Incorrect; the correct spelling is LITERATE.

Q. 11	<p>Choose the most appropriate option to change the voice (active/passive) form of the given sentence.</p> <p>Do not take the coastal road during monsoons.</p> <p>a) You are not taking the coastal road during monsoons. X</p> <p>b) You will not take the coastal road during monsoons. X</p> <p>c) Coastal road is not being taken during monsoons. X</p> <p>d) Coastal roads should not be taken during monsoons. ✓</p>
Explanation:	<p>Correct answer: Option D. Coastal roads should not be taken during monsoons.</p> <ul style="list-style-type: none"> • The given sentence is in the imperative active voice (negative): "Do not take the coastal road during monsoons." • Form for passive voice of negative imperatives: Do not + verb (active) → should not be + past participle (passive)

Q. 12	<p>Choose the most appropriate option to change the narration (direct/indirect) of the given sentence.</p> <p>He asked me if I would like to take that apartment on rent from the next day.</p> <p>a) "Would you had taken this apartment on rent from tomorrow?" he said to me. X</p> <p>b) "Would you have taken this apartment on rent from the next day?" he said to me. X</p> <p>c) "Would you like to take this apartment on rent from tomorrow?" he said to me. ✓</p> <p>d) Would you be liking to take this apartment on rent from tomorrow?" he said to me. X</p>
Explanation:	<p>Correct answer: (C) "Would you like to take this apartment on rent from tomorrow?" he said to me.</p> <p>Given (Indirect): <i>He asked me if I would like to take that apartment on rent from the next day.</i> convert this into Direct Speech.</p> <ol style="list-style-type: none"> 1. He asked me if → becomes he said to me, "..." (we use quotation marks for direct speech). 2. "I would like" → changes to "Would you like" (speaker directly asking me). 3. "That apartment" → changes to "this apartment" (spoken directly). 4. "From the next day" → changes to "from tomorrow".

Q. 13	<p>Identify the segment in the sentence, which contains the grammatical error.</p> <p>Does an English examinations begin at 10 o'clock?</p> <p>a) 10 o'clock? X</p> <p>b) English examinations X</p> <p>c) begin at X</p> <p>d) Does an ✓</p>
Explanation:	<p>Correct answer: Option 4 – "Does an"</p> <ul style="list-style-type: none"> ● The noun phrase "English examinations" is plural. Therefore, the auxiliary verb should also be plural. ● For plural subjects in the simple present tense, we use "Do" instead of "Does" for questions. ● Additionally, "examinations" is plural, so the indefinite article "an" (used before singular nouns starting with a vowel sound) is incorrect. <p>Correct sentence: "Do English examinations begin at 10 o'clock?"</p>

Q. 14	<p>Identify the best way to improve the underlined part of the given sentence. If there is no improvement required, select 'No improvement'.</p> <p>The Inspector stopped the boy and asked where <u>he went</u>.</p> <p>a) he had going </p> <p>b) No improvement </p> <p>c) he has gone </p> <p>d) he was going </p>
Explanation:	<p>Correct answer: Option D – he was going</p> <ul style="list-style-type: none"> 1st part of the sentence is in past tense so use past tense <p>Had gone/ was going</p>
Q. 15	<p>Identify the segment in the sentence, which contains the grammatical error.</p> <p>I use to going for a morning walks when I was lived in Dehradun.</p> <p>a) living in Dehradun </p> <p>b) for a morning walk </p> <p>c) when I was </p> <p>d) use to going </p>
Explanation:	<p>Correct answer: Option D – use to going</p> <ul style="list-style-type: none"> "used to" is correct here. It can be used to show past habit/action/ state.
Q. 16	<p>Select the most appropriate meaning of the given idiom</p> <p>To paddle one's own canoe</p> <p>a) Put his foot down </p> <p>b) Stands on his own legs </p> <p>c) Stand against </p> <p>d) Heart and soul </p>
Explanation:	<p>Correct answer: Option B – Stands on his own legs</p> <ul style="list-style-type: none"> The idiom "to paddle one's own canoe" means to be independent and self-reliant, handling one's own affairs without needing or expecting help from others.

Q. 17	<p>Complete the following sentence with suitable phrasal verb :</p> <p>The fear that AIDS has broken _____ in India is not unfounded.</p> <p>a) Up </p> <p>b) About </p> <p>c) Out </p> <p>d) In </p>
Explanation:	<p>Correct answer: Option C – Out</p> <ul style="list-style-type: none"> • "break out" means to start suddenly or violently, often referring to diseases, wars, or fires. In this, it refers to the sudden emergence and spread of AIDS in India. <p>Other options:</p> <p>Break up = to end a relationship or meeting.</p> <p>Break in = to enter forcefully or interrupt.</p>
Q. 18	<p>Complete the following sentence with suitable word :</p> <p>Many _____ man would welcome such a chance.</p> <p>a) a </p> <p>b) an </p> <p>c) the </p> <p>d) No article </p>
Explanation:	<ul style="list-style-type: none"> • Correct answer: Option A – a • Correct determiner many a/an. • "many a + singular noun," is used to express the idea of "many" in a slightly more formal or literary way, emphasizing each individual within the larger group. It always takes a singular verb (in this case, "would welcome").
Q. 19	<p>Find out the CORRECTLY spelt word</p> <p>a) Gauranten </p> <p>b) Garuntee </p> <p>c) Guarantee </p> <p>d) Guaruntee </p>
Explanation:	<p>Correct answer: Option C – Guarantee</p> <ul style="list-style-type: none"> • Guarantee is the correctly spelled word. • It means a formal promise or assurance.

Q. 20	<p>Find out the most appropriate one word for the given sentence A disease that lasts for a long time and is difficult to cure</p> <p>a) Chronic ✓</p> <p>b) Delirious ✗</p> <p>c) Prerogative ✗</p> <p>d) Appaling ✗</p>
	<p>Correct answer: <i>Chronic</i></p> <ul style="list-style-type: none"> • Chronic – a disease or condition that lasts for a long time and is difficult to cure. (Example: <i>Chronic asthma, chronic back pain</i>) <p>Explanation: Other Options:</p> <ul style="list-style-type: none"> • Delirious – confused thinking, often due to illness or fever. (बड़बड़ाने वाला, अस्तित्व) • Prerogative – a right or privilege exclusive to a person/group. (विशेष अधिकार) • Appalling – very bad or shocking. (भयानक, डरावना)
Q. 21	<p>In the following passages, some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.</p> <p>As he started his speech, Harsh was aware that people were listening to him quite..... (1)..... Things seemed to be going quite well.....(2)....., halfway through the talk, he saw his friend, Ravi look.....(3).....his pal Sunil, roll his eyes and whisper in his ear. Harsh..... (4).....understood that Ravi, who had been upset ever since his promotion, was now.....(5)..... disturbance intentionally. Select the most appropriate option to fill in blank no. 1.</p> <p>a) Intently ✓</p> <p>b) Smoothly ✗</p> <p>c) Evenly ✗</p> <p>d) Clearly ✗</p>
	<p>Correct answer: Option A – Intently</p> <p>Explanation:</p> <ul style="list-style-type: none"> • "Intently" means with great concentration or attention, which is correct in the context of people listening to a speech.

Q. 22	<p>In the following passages, some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.</p> <p>As he started his speech, Harsh was aware that people were listening to him quite..... (1)..... Things seemed to be going quite well.....(2)....., halfway through the talk, he saw his friend, Ravi look.....(3).....his pal Sunil, roll his eyes and whisper in his ear. Harsh..... (4).....understood that Ravi, who had been upset ever since his promotion, was now.....(5)..... disturbance intentionally. Select the most appropriate option to fill in blank no. 2.</p> <p>a) Wherever </p> <p>b) Whenever </p> <p>c) Moreover </p> <p>d) However </p>
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Correct answer: Option D – However

Explanation:	<ul style="list-style-type: none"> ● "However" is a contrasting conjunction that indicates a shift or unexpected turn in the situation. It shows that despite the initial positive impression of the audience listening intently and things going well, something changed midway through the speech.
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Q. 23	<p>In the following passages, some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.</p> <p>As he started his speech, Harsh was aware that people were listening to him quite..... (1)..... Things seemed to be going quite well.....(2)....., halfway through the talk, he saw his friend, Ravi look.....(3).....his pal Sunil, roll his eyes and whisper in his ear. Harsh..... (4).....understood that Ravi, who had been upset ever since his promotion, was now.....(5)..... disturbance intentionally. Select the most appropriate option to fill in blank no. 3.</p> <p>a) At </p> <p>b) Opposite </p> <p>c) Through </p> <p>d) In </p>
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Correct answer: Option A – At

Explanation:	<ul style="list-style-type: none"> ● The preposition "at" is used to indicate the direction of someone's gaze. Ravi directed his look towards Sunil.
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Q. 24

In the following passages, some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.

As he started his speech, Harsh was aware that people were listening to him quite..... (1)..... Things seemed to be going quite well.....(2)....., halfway through the talk, he saw his friend, Ravi look.....(3).....his pal Sunil, roll his eyes and whisper in his ear. Harsh..... (4).....understood that Ravi, who had been upset ever since his promotion, was now.....(5)..... disturbance intentionally.

Select the most appropriate option to fill in blank no. 4.

a) Immediately ✓

b) Keenly ✗

c) Urgently ✗

d) Cleverly ✗

Correct answer: Option A – Immediately

Explanation:

- "Immediately" indicates that Harsh understood Ravi's intention right away upon seeing his actions.

Q. 25

In the following passages, some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.

As he started his speech, Harsh was aware that people were listening to him quite..... (1)..... Things seemed to be going quite well.....(2)....., halfway through the talk, he saw his friend, Ravi look.....(3).....his pal Sunil, roll his eyes and whisper in his ear. Harsh..... (4).....understood that Ravi, who had been upset ever since his promotion, was now.....(5)..... disturbance intentionally.

Select the most appropriate option to fill in blank no. 5.

a) Created ✗

b) Create ✗

c) Creates ✗

d) Creating ✓

Correct answer: Option D – Creating

Explanation:

- The verb "was" requires a verb in the present participle form (-ing) to indicate a continuous action in the past. Therefore, "creating" is the correct choice to show that Ravi was in the process of causing a disturbance.

Q. 26

Study the given pattern carefully and select the number that can replace the question mark (?) in it.

54	40	56
68	57	44
47	39	?

- a) 22
- b) 30
- c) 39
- d) 32

Correct answer is option 4.

Explanation:

$$\begin{aligned} 54 - 40 &= 14 ; 14 \times 4 = 56 \\ 68 - 57 &= 11 ; 11 \times 4 = 44 \\ \text{Similarly,} \\ 47 - 39 &= 8 ; 8 \times 4 = 32 \end{aligned}$$

Q. 27

Which number will replace the question mark (?) in the following question.

456, ?, 427, 414, 402, 391, 381.

- a) 394
- b) 404
- c) 441
- d) 450

Correct answer is option 3.

Explanation:

$$\begin{aligned} 456 - 15 &= 441 \\ 441 - 14 &= 427 \\ 427 - 13 &= 414 \\ 414 - 12 &= 402 \\ 402 - 11 &= 391 \\ 391 - 10 &= 381 \end{aligned}$$

Q. 28	<p>If 18 October 2006 was Wednesday, then what was the day on the week of 17 October 2000 ?</p> <p>a) Tuesday ✓</p> <p>b) Wednesday ✗</p> <p>c) Monday ✗</p> <p>d) Sunday ✗</p>
Explanation:	<p>Correct answer is option 1.</p> <p>To find the day on the same date of the same month:</p> <p>In case of an ordinary year : Given day + 1 day</p> <p>In case of a leap year : Given day + 2 days</p> <p>(Here, we consider the month of February as there are 29 days)</p> <p>Now, According to question, we have to go back in time to find the day on the given date and month. Given: 18 October 2006 Wednesday</p> <p>18 October 2005 Wednesday - 1 = Tuesday 18 October 2004 Tuesday - 1 days = Monday 18 October 2003 Monday - 2 days = Saturday</p> <p>(The month of February lies between 18 October 2003 and 18 October 2004, which is a leap year) 18 October 2002 Saturday - 1 day = Friday 18 October 2001 Friday-1 day Thursday 18 October 2000 Thursday - 1 = Wednesday 17 October 2000 Wednesday - 1 day = Tuesday (Here, we've subtracted 1 day because the month of February is before 17 October 2000)</p> <p>PTS Way : 18 October 2006 from 17 October 2000 there are = 5 ordinary and 1 leap year No. of days that should be subtracted from Wednesday = 5 for ordinary year + 2 for leap year 18 October 2000 = Wednesday - 7 days = Wednesday 17 October 2000 = Wednesday - 1 = Tuesday Hence, Tuesday is correct.</p>

Q. 29 Select the correct option that indicates the arrangement of the following word in a logical and meaningful order.

1. Scrutiny
 2. Application
 3. Interview
 4. Job Offer
 5. Joining
- a) 2,1,3,4,5 ✓
- b) 2,3,1,4,5 ✗
- c) 4,3,5,2,1 ✗
- d) 4,2,3,1,5 ✗

Correct answer is option 1.

Explanation:

Correct sequence is :

2.Application >1. Scrutiny >3.Interview >4. Job offer >5 Joining

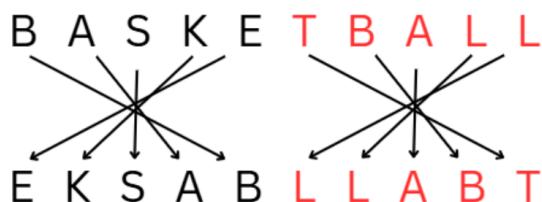
Q. 30

Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first. letter-cluster.

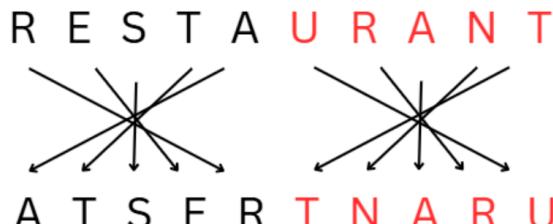
BASKETBALL: EKSABLLABT :: RESTAURANT ?

- a) ATSETRNARU ✗
- b) ATSRETNARU ✗
- c) ATSSERTNARU ✓
- d) ATSSERTANRU ✗

Correct answer is option 3.



Explanation:



Q. 31 In a code language, 'MOON' is written as '63' and 'SUN' is written as '60'. How will 'EARTH' be written in that language?

a) 65 ✗

b) 58 ✓

c) 61 ✗

d) 59 ✗

Correct answer is option 2.

Explanation:

$$M (13) + O (15) + O (15) + N (14) = 57 + 6 = 63$$

$$S (19) + U (21) + N (14) = 54 + 6 = 60$$

Similarly;

$$E (5) + A (1) + R (18) + T (20) + H (8) = 52 + 6 = 58$$

Q. 32

In a code language, if 'you are there' is written as 'ter der jer', 'we stay here' is written as 'yer mer ner', 'we are late' is written as 'ser ner der', and 'I stay there' is written as 'yer fer jer', then how would 'you stay late' be written in this language?

a) ter yer ser ✓

b) ter yer mer ✗

c) der yer ser ✗

d) ter mer ser ✗

Correct answer is option 1.

you are there → ter der jer

(we) stay here → (yer) mer ner

(we) are late → ser ner der

I stay there → (yer) fer jer

Explanation:

Word : Code

You : ter

Are : der

There : jer

We : ner

Stay : yer

Here : mer

Late : ser

I : fer

Q. 33

Two statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

All Editors are Magazines.

Some Editors are computers.

Conclusions:

I. Some computers are editors.

II. Some computers are magazines.

III. Some magazines are Editors

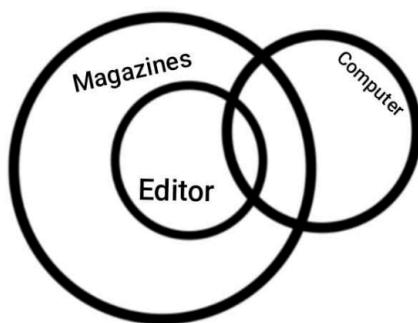
a) All of the conclusions follow ✓

b) Only conclusions I and II follow ✗

c) Only conclusions II and III follow ✗

d) Only conclusions I and III follow ✗

Correct answer is option 1.



Explanation:

I. Some computers are editors : Follow. According to the second statement.

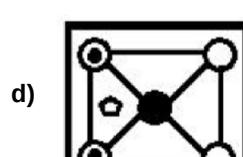
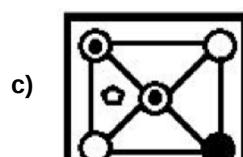
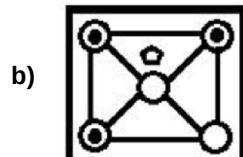
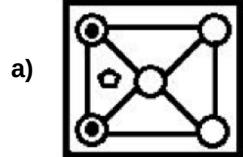
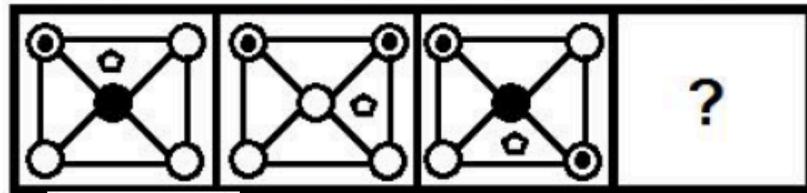
II. Some computers are magazines : Follow. Those editors who are computers are also magazines.

III. Some magazines are Editors : Follow. All editors are magazines, it means editors are a subset of magazines.

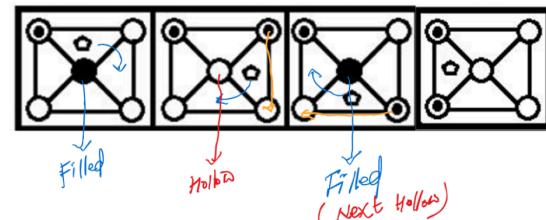
Q. 34	<p>Select the correct combination of mathematical signs that can sequentially replace the signs (*) from left to right to balance the following equation.</p> <p>$23*3*40*20*45*26$</p> <p>a) -, ÷, +, ×, = ✗</p> <p>b) ×, +, ÷, -, = ✓</p> <p>c) ×, ÷, +, -, = ✗</p> <p>d) ×, -, +, ÷, = ✗</p>
Explanation:	<p>Correct answer is option 2.</p> <p>$(23 \times 3) + (40 \div 20) - 45 = 26$ $69 + 2 - 45 = 26$</p>

Q. 35

Which answer figure will replace the question mark (?) in the given figure series ?

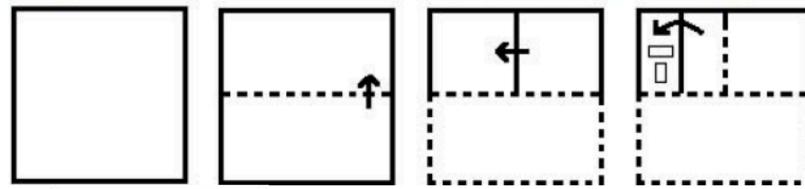
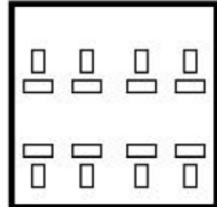
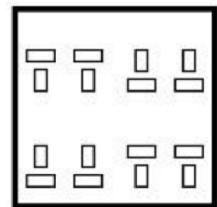
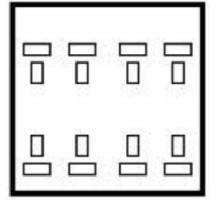
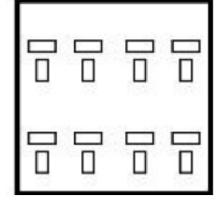


Explanation:

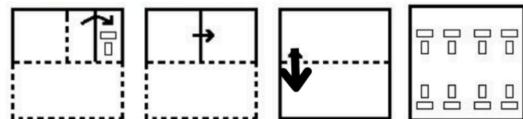


Q. 36

The paper is folded and cut as shown below. How will it appear when unfolded ?

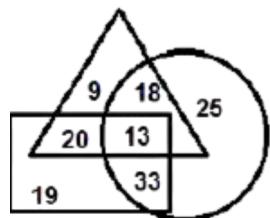
**a)****b)****c)****d)**

Correct answer is option 3.

Explanation:

Q. 37

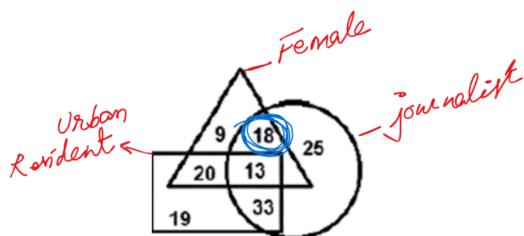
In the following Venn diagram, the 'Circle' stands for 'Journalists', the 'Triangle' stands for 'Females' and the Rectangle stands for 'Urban residents'. The given numbers represent the number of persons in that particular category. How many journalists are females but NOT urban residents?



- a) 25 X
- b) 9 X
- c) 18 ✓
- d) 13 X

Correct answer is option 3.

Explanation:



Clearly, there are 18 journalists who are female but not urban residents.

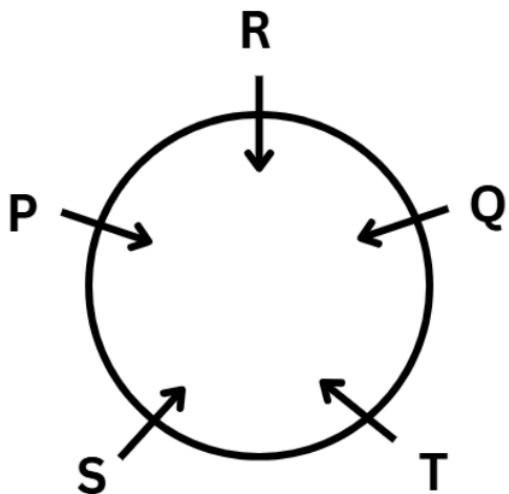
Q. 38

Five friends P, Q, R, S and T are sitting around a circular table facing the center of the table. S is sitting to the immediate right of P. T is sitting to the immediate left of Q. P is sitting between S and R.

Who is sitting at the second place to the left of T?

- a) Q
- b) R
- c) P
- d) S

Correct answer is option 3.

Explanation:

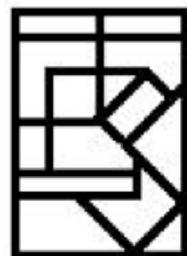
Clearly, P is sitting in second place left of T.

Q. 39

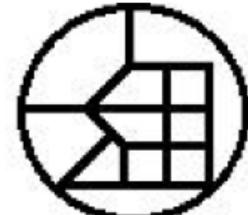
Select the option in which the given figure is embedded (rotation is NOT allowed)



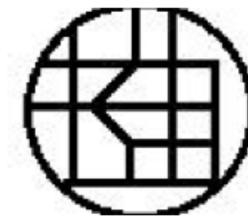
a)



b)



c)



d)



Correct answer is option 4.

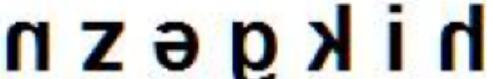
Explanation:



Q. 40

Select the correct mirror image of the given combination when the mirror is placed at PQ as shown below.

h i k g e z n
P
|
Q

- a)  
- b)  
- c)  
- d)  

Correct answer is option 4.

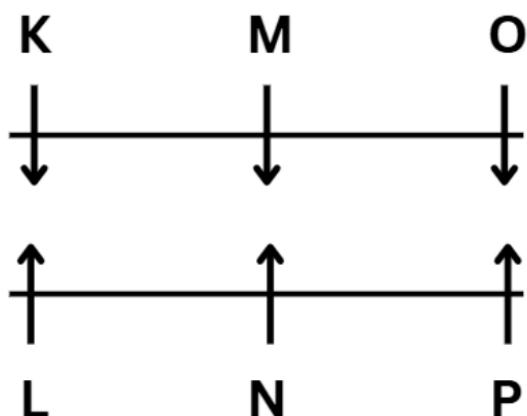
Explanation:

h i k g e z n u z e a d k i
P
|
Q

Q. 41	<p>Two teams, consisting of 3 players in each team, are participating in a debate competition. Three players in one team are sitting facing the three players of the other team. K and L are sitting facing each other. N and O are in different teams. M is sitting facing N. P is at one of the corners. N is sitting to the immediate right of L. Which of the following are members of the same team?</p> <p>a) O, K and N <input checked="" type="checkbox"/> X</p> <p>b) K, M and P <input checked="" type="checkbox"/> X</p> <p>c) N, L and M <input checked="" type="checkbox"/> X</p> <p>d) L, N and P <input checked="" type="checkbox"/> ✓</p>
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Correct answer is option 4.

According to the question given, the figure is



It is clear that L, N and P are in the same team.

Q. 42	<p>Select the number-pair in which the two numbers are related in the same way as are the two numbers of the flowing number-pair.</p> <p>15:195</p> <p>a) 20:400 <input checked="" type="checkbox"/> X</p> <p>b) 28:728 <input checked="" type="checkbox"/> ✓</p> <p>c) 25:650 <input checked="" type="checkbox"/> X</p> <p>d) 17:205 <input checked="" type="checkbox"/> X</p>
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Correct answer is option 2.

Explanation:

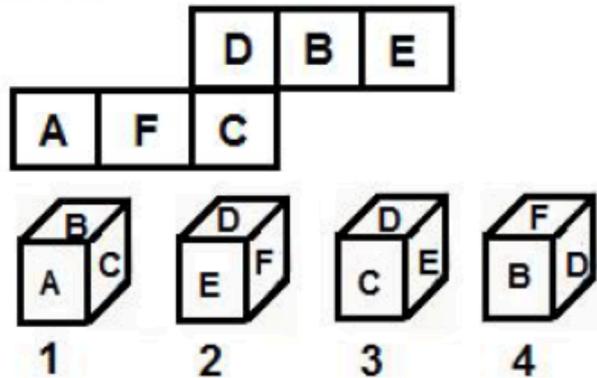
$15^2 - (15 \times 2) = 195$

Similarly;

$28^2 - (28 \times 2) = 728$

Q. 43

Select the dice that can be formed by folding the given sheet in the form of a cube.



- a) 1 and 4 can be formed. X
- b) None can be formed. ✓
- c) Only 2 can be formed. X
- d) Only 3 can be formed X

Correct answer is option 2.

Explanation:

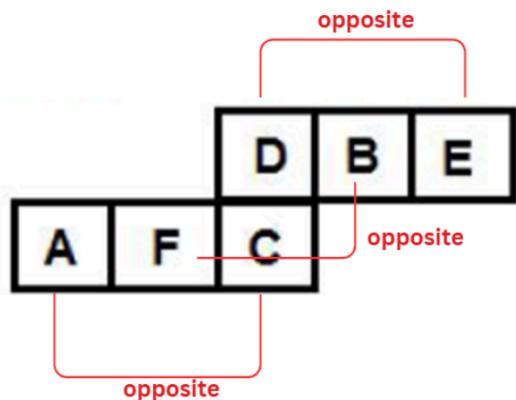


Figure 1 : A and C are adjacent faces which is not possible.

Figure 2 : D and E are adjacent faces which is not possible

Figure 3 : again, D and E are adjacent faces which is not possible

Figure 4 : F and B are adjacent faces which is not possible.

Q. 44

- Select the number-pair in which the two numbers are related in the same way as are the two numbers of the following number-pair.
 6:108
- a) 7:145 X
 b) 9:243 ✓
 c) 5:68 X
 d) 4:43 X

Correct answer is option 2.

Explanation:

$$\begin{aligned} \text{Logic is : } & 6^2 \times 3 = 108 \\ & = 36 \times 3 = 108 \\ \text{Similarly, } & 9^2 \times 3 = 81 \times 3 = 243 \end{aligned}$$

Q. 45

Study the given pattern carefully and select the number that can replace the question mark (?) in it.

4507	7077	37
2503	3067	26
3307	4061	?

- a) 72 X
 b) 67 X
 c) 24 ✓
 d) 45 X

Correct answer is option 3.

Explanation:

$$\begin{aligned} 1^{\text{st}} \text{ Row : } & 4+5+0+7 + 7+0+7+7 = 37 \\ 2^{\text{nd}} \text{ Row : } & 2+5+0+3 + 3+0+6+7 = 26 \\ \text{Similarly, } & 3^{\text{rd}} \text{ Row : } 3+3+0+7 + 4+0+6+1 = 24 \end{aligned}$$

Q. 46

If the minute hand of a clock points towards the South at 12:00 am, then in which direction will the minute hand point at 3:00 am. in the same clock?

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

Explanation:

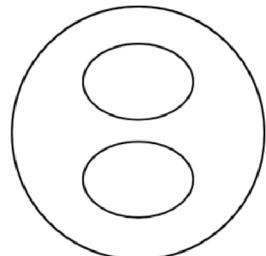
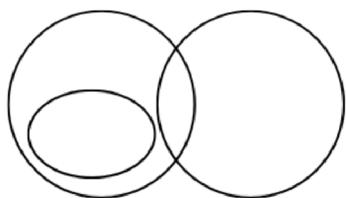
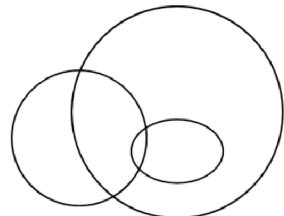
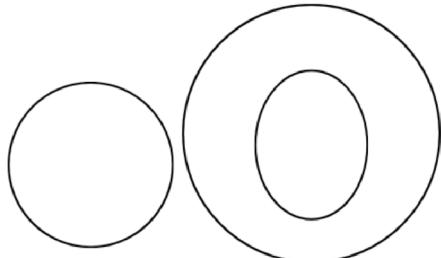
Correct answer is option 2.



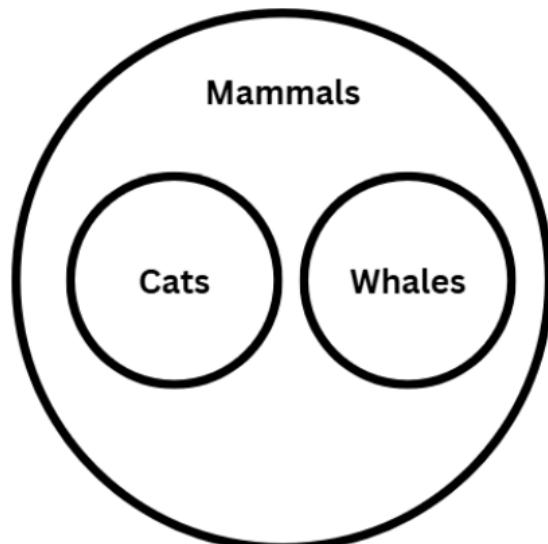
As you can see, Minute hand is in the south direction when it is 3:00 am.

Q. 47

Select the Venn Diagram that best illustrates the relationship between the following classes.
Mammals, Cats, Whales

a)**b)****c)****d)**

Correct answer is option 1.

Explanation:

Cats and Whales both are mammals but Cat is terrestrial animal and whale is aquatic animal.

Q. 48	<p>Select the option that represents the letters that when placed from left to right in the blanks below will complete the letter series.</p> <p>D _ T _ U _ T __ T S _ R __ E _ S U _ T</p> <p>a) ESRDEUTDTR ✓</p> <p>b) SEDRETUEDR ✗</p> <p>c) ERSDEUDTRT ✗</p> <p>d) SEREDUDTRT ✗</p>
Explanation:	<p>Correct answer is option 1</p> <p>Sequence is :</p> <p>D E T S U R T D E T S U R T D E T S U R T</p>

Q. 49	<p>Pointing to a photograph of a girl, Sam said, "She is my wife's sister's mother's only son's daughter". How is Sam's wife related to that girl's paternal grandfather?</p> <p>a) Sister ✗</p> <p>b) Paternal aunt ✗</p> <p>c) Daughter ✓</p> <p>d) Daughter-in-law ✗</p>
Explanation:	<p>Correct answer is option 3.</p> <p>Sam's Wife Mother = Sam's Wife's Father</p> <p>Sam = Sam's Wife — Sam's Wife Sister — Sam's Wife Brother</p> <p>Sam's Wife Brother's Daughter (Girl in photo)</p> <p>Clearly, Sam's wife is the daughter of the paternal grandfather of the girl in the photograph.</p>

Q. 50

Two statements are given, followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follows from the statements.

Statements:

Some lions are Omnivores.

All Elephants are Herbivores.

Some herbivores are lions.

Conclusions:

I. No Herbivores is an Omnivore.

II. Some Herbivores are Omnivores.

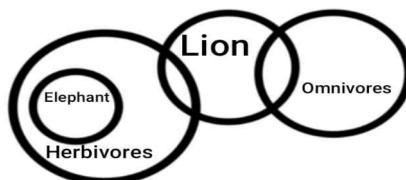
a) Both conclusions follow

b) Either conclusion I or II follows

c) Only conclusion I follows

d) Only conclusion II follows

Correct answer is option 2.



Explanation:

Conclusions:

I. No Herbivores is an Omnivore : False (There is no direct relation between herbivores and omnivores).

II. Some Herbivores are Omnivores : False (There is no direct relation between herbivores and omnivores).

In conclusions I and II there is a relation of some and no between herbivores and omnivores, they form a complementary pair and hence either conclusion I or II follows.

Q. 51	<p>Which of the following Articles of the Indian constitution provides for the National commission for Scheduled Castes ?</p> <p>a) Article 337 </p> <p>b) Article 344 </p> <p>c) Article 343 </p> <p>d) Article 338 </p>
Explanation:	<p>Correct answer = Option 4 (Article 338)</p> <ul style="list-style-type: none">• Article 337 = Deals with the continuation of educational grants to the Anglo-Indian community.• Article 344 = Provides for the formation of a Commission (first after 5 years, then every 10 years) to recommend steps for the progressive use of Hindi as the official language.• Article 343 = Declares Hindi in Devanagari script as the official language of the Union of India.• Article 338 = Provides for the establishment of the National Commission for Scheduled Castes (NCSC).• Article 338A =<ul style="list-style-type: none">◦ Provides for the National Commission for Scheduled Tribes (NCST).◦ This article was inserted by the 89th Constitutional Amendment Act 2003.• Article 338B =<ul style="list-style-type: none">◦ Provides for the National Commission for Backward Classes.• This article was inserted by the 102nd Constitutional Amendment Act of 2018.

Q. 52	<p>Which one of the following statements about the ishtahars issued during the Revolt of 1857 is correct?</p> <p>a) They glorified the Muslim rule in India X</p> <p>b) They glorified the co-existence of different communities under the Mughal Empire. ✓</p> <p>c) They glorified the message of Islam X</p> <p>d) They glorified the role of Queen Victoria. X</p>
Explanation:	<p>Correct answer = Option 2 (They glorified the co-existence of different communities under the Mughal Empire)</p> <ul style="list-style-type: none"> • Ishtahars = <ul style="list-style-type: none"> o During the Revolt of 1857 proclamations or public declarations were issued by rebel leaders and their supporters. o The ishtahars were political, not purely religious, in nature. o The ishtahars were against British rule, including Queen Victoria's authority. o Emphasized the harmony between Hindus and Muslims under the Mughal Empire under Bahadur Shah Zafar who was declared the symbolic leader of the revolt. <p><u>Revolt of 1857:</u></p> <ul style="list-style-type: none"> • Revolt or rebellion against British rule in India. • It's also known as the Indian Mutiny (by some Western historians) or the First War of Independence (V.D. Savarkar). • Key Events and Centers of the Revolt = <ul style="list-style-type: none"> o Delhi = General Bakht Khan o Kanpur = Led by Nana Sahib. o Lucknow = Led by Begum Hazrat Mahal. o Jhansi = Led by Rani Lakshmibai. o Gwalior = A significant battleground involving Rani Lakshmibai and Tantia Tope. o Bihar = Led by Kunwar Singh. o Awadh region = Ahmadullah Shah • End of East India Company Rule = The British government took direct control of India under the Government of India Act 1858. • Viceroy = Lord Canning.

Q. 53	<p>The mismatch in the regional or occupational pattern of job vacancies and the pattern of worker availability results in</p> <p>a) Structural unemployment ✓</p> <p>b) Disguised unemployment ✗</p> <p>c) Altered unemployment ✗</p> <p>d) Cyclical unemployment ✗</p>
Explanation:	<p>Correct answer = Option 1 (Structural unemployment)</p> <p><u>Unemployment</u> =</p> <ul style="list-style-type: none">• The situation where individuals who are willing and able to work at the prevailing wage rate cannot find jobs.• Types of Unemployment =<ul style="list-style-type: none">◦ Cyclical Unemployment = Job losses due to downturns in the business cycle, like recessions.◦ Frictional Unemployment =<ul style="list-style-type: none">▪ Frictional unemployment, also called search unemployment.▪ Occurs when workers lose their current job and are in the process of finding another one.◦ Structural Unemployment = Unemployment caused by a mismatch between worker skills and available job requirements.◦ Disguised Unemployment = A situation where more workers are employed than needed, with some having zero marginal productivity.• Educated Unemployment = Among the educated people, apart from open unemployment, many are underemployed because their qualification does not match the job.

Q. 54	<p>Which one of the following is not an example of an oxidation reaction?</p> <p>a) The taste of butter changes if left for a longer period X</p> <p>b) A white substance is formed when an aqueous solution of barium chloride is mixed with sodium sulphate solution ✓</p> <p>c) A reddish-brown powder gets coated on articles made of iron X</p> <p>d) Wine gets sour with time X</p>
Explanation:	<p>Correct answer = Option 2 (A white substance is formed when an aqueous solution of barium chloride is mixed with sodium sulphate solution)</p> <ul style="list-style-type: none"> • Oxidation reaction = <ul style="list-style-type: none"> o It involves the loss of electrons or an increase in the oxidation state of an atom. o It often manifests as the combination of a substance with oxygen. o Ex:- <ul style="list-style-type: none"> ▪ A reddish-brown powder gets coated on articles made of iron ▪ Wine gets sour with time. ▪ The taste of butter changes if left for a longer period. • Precipitation reaction = <ul style="list-style-type: none"> o In this reaction, there is an exchange of ions but no change in the oxidation states of the elements involved. o Ex:- A white substance is formed when an aqueous solution of Barium chloride is mixed with Sodium Sulphate solution. • Reduction Reaction = <ul style="list-style-type: none"> o A substance gains electrons or its oxidation state decreases. o These are the opposite of oxidation. o Ex:- The extraction of iron from its ore involves the reduction of iron oxide (Fe_2O_3) by carbon monoxide (CO) in a blast furnace • Redox reactions = Oxidation and Reduction happen together.

Q. 55

The Songi Mukhawate dance of _____ celebrates the victory of truth over falsehood. The name of the dance is derived from the two lion masks worn by two dancers who represent Narasimha, an aspect of Lord Vishnu.

- a) Madhya Pradesh
- b) Jharkhand
- c) Maharashtra
- d) Gujarat

Explanation:	<p>Correct answer = Option 3 (Maharashtra)</p> <p>States & their folk dances =</p> <ul style="list-style-type: none"> • Madhya Pradesh = <ul style="list-style-type: none"> ○ Matki = A solo dance performed by women, often with a pot balanced on their head, especially during weddings. ○ Gaur Maria = A vibrant tribal dance of the Bison-horn Maria tribe. ○ Jawara = A harvest dance performed by the peasant community. ○ Tertali = A unique dance form involving intricate balancing acts with small metallic cymbals. by KAMAR tribe. ○ Phulpatti = A dance by unmarried women, celebrating nature. ○ Grida = Performed when the Rabi crops are in bloom, with increasing tempo and movements. ○ Maanch = A traditional folk theatre form with songs and dances. ○ Bhagoria = BHIL tribe, in jhabua district, harvest festival ○ Kaksar = ABUJHMARIA tribe ○ Swang dance ○ Aada dance • Jharkhand = <ul style="list-style-type: none"> ○ Seraikella Chhau: = A semi-classical dance with martial and folk elements, known for its expressive masks in the Seraikella and Purulia styles. ○ Karma Munda = A dance associated with the Munda tribe during harvest and festivals. ○ Santhali Dance = Various dances of the Santhal tribe, often reflecting their social and cultural life. ○ Paika = A martial folk dance traditionally performed by men with weapons. ○ Jhumair = A popular folk dance during harvest and festivals, often performed in a circular formation. ○ Domkach = A dance performed during weddings and festivals. ○ Fagua = A dance performed during the Holi festival. ○ Mundari Dance = Dances of the Munda community. ○ Hunta dance ○ Jhika Dasain dance ○ OHIRA folk music • Maharashtra = <ul style="list-style-type: none"> ○ Lavani = A popular folk dance known for its energetic movements and often sensuous themes.BAITHAKICHI folk music ○ Koli = dance of the fishing community, depicting their lives and relationship with the sea. ○ Lezim =A vigorous dance performed with small musical instruments called Lezim ○ . ○ . ○ Dhangari Gaja = A dance of the shepherd community (Dhangars), glorifying their deity. ○ Tamasha = A traditional folk theatre form with dance, music, and drama. ○ Dindi = A devotional dance associated with the Varkari pilgrimage. ○ Bohada (Dahikala Dasavtar) = A mask dance representing deities and mythological characters
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- o **Songi Mukhawate** = Celebrates the victory of truth over falsehood. The name of the dance is derived from the two lion masks worn by two dancers who represent Narasimha, an aspect of Lord Vishnu.
- o
- **Gujarat** =
 - o **Garba** = A circular dance traditionally performed during the Navratri festival, honoring the Mother Goddess.
 - o **Dandiya Raas** = An energetic dance using decorated sticks (dandiya), also popular during Navratri.
 - o **Bhavai** = A traditional folk theatre form with dance and storytelling.
 - o **Tippani** = A dance originating from laborers, using long sticks (tippanis).
 - o **Padhar** = A dance of the Padhar community, who are primarily fishermen.
 - o **Hudo** = A dance popular among the Bharvad (shepherd) community.
 - o **Gop** = A dance associated with the shepherd community and stories of Lord Krishna.

Q. 56	<p>Which of the following is NOT correct with regards to the history of calculating National Income (NI) in India?</p> <p>a) First attempt to compute NI was made by Dadabhai Naoroji X</p> <p>b) First scientific method to compute NI was used by Dr VKR V Rao. X</p> <p>c) Dadabhai Naoroji divided the Indian economy into two parts: primary sector and secondary sector. ✓</p> <p>d) First official attempt to compute NI was made by PC Mahalanobis. X</p>
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Correct answer = Option 3 (Dadabhai Naoroji divided the Indian economy into two parts: primary sector and secondary sector)

- **National Income** = The total of money earned within a country.
- **Dadabhai Naoroji (1867-68)** =
 - o The first person to attempt to estimate India's national income.
 - o In his book "Poverty and Un-British Rule in India," estimated the **national income** for 1867-68 to be **₹340 crore** and the **per capita income at ₹20**.
 - o His primary aim was to highlight the economic drain from India under British rule.
- **V.K.R.V. Rao (1931-32)** =
 - o The first scientific attempt at estimating India's national income.
 - o His book "The National Income of British India (1931-32)".

Explanation:

- **The National Income Committee (1949)** =
 - o This was the first official attempt to compute national income.
 - o **Chairman** = Professor P.C. Mahalanobis.
 - o **Members** = Professor D.R. Gadgil and Professor V.K.R.V. Rao.
 - o The committee submitted its first report in 1951, estimating India's national income for 1948-49.
 - o On the recommendation of the **National Income Committee**, the responsibility for preparing **national income** estimates was entrusted to the **Central Statistical Organisation (CSO)** in 1955.

Q. 57	<p>Which of the following statements is INCORRECT regarding Fundamental Rights?</p> <p>a) Fundamental Rights can be enforced by Law. </p> <p>b) Fundamental rights are derived from the Britain Constitution. </p> <p>c) The Fundamental Rights are mentioned in the constitution from article 12 to 35. </p> <p>d) Article 21 provides the right to life </p>
Explanation:	<p>Correct answer = Option 2 (Fundamental rights are derived from the Britain Constitution)</p> <p>Fundamental Rights:</p> <ul style="list-style-type: none">• Fundamental Rights are enshrined in Part III of the Constitution of India, spanning from Article 12 to Article 35.• Taken from the USA.• These rights are justiciable under Article 32 meaning citizens can go to court to enforce them.• Fundamental rights includes =<ul style="list-style-type: none">◦ Right to Equality = Articles 14-18◦ Right to Freedom = Articles 19-22◦ Right against Exploitation = Articles 23-24◦ Right to Freedom of Religion = Articles 25-28◦ Cultural and Educational Rights = Articles 29-30◦ Right to Constitutional Remedies = Article 32 (called the heart and soul of the Constitution by Dr. Ambedkar)• After the 44th Amendment Act of 1978, the Right to Property was removed from Part III and made a legal right under Article 300A in Part XII.• During a national emergency (Article 352) most of the Fundamental Rights suspended except Articles 20 and 21.

Q. 58**With which sport is the Indian Para Athlete Parul Parmar associated?**

- a) Swimming
- b) Athletics
- c) Badminton
- d) Shooting

Correct answer = Option 3 (Badminton)

Some Indian para-athletes associated with sport:

- **Swimming =**
 - **Murlikant Petkar** = He was India's first-ever Paralympic gold medalist, winning gold in the men's 50m freestyle at the 1972 Heidelberg Paralympics.
 - **Suyash Narayan Jadhav**.
- **Athletics =**
 - **Devendra Jhajharia** =
 - A javelin thrower and two-time Paralympic gold medalist (**Athens 2004 and Rio 2016**).
 - He also won silver at the Tokyo 2020 Paralympics.
 - **Mariyappan Thangavelu** =
 - A high jumper who won gold at the Rio 2016 Paralympics
 - Silver at the Tokyo 2020 Paralympics
 - Bronze at the Paris 2024 Paralympics
 - The first Indian to win three Paralympic medals in high jump.
 - **Deepa Malik** = The first Indian woman to win a Paralympic medal.
 - **Sumit Antil** =
 - A javelin thrower who won gold at the Tokyo 2020 Paralympics with a world record throw.
 - Gold at the Paris 2024 Paralympics also with a world record.
 - **Preethi Pal** = A track athlete who won two bronze medals in the women's 100m and 200m T35 events at the Paris 2024 Paralympics.
- **Badminton =**
 - **Pramod Bhagat** = Won gold in the men's singles SL3 category at the Tokyo 2020 Paralympics.
 - **Krishna Nagar** = Won gold in the men's singles SH6 category at the Tokyo 2020 Paralympics.
 - **Nitesh Kumar** = Won gold in the men's singles SL3 category at the Paris 2024 Paralympics.
 - **Parul Parmar**
- **Shooting =**
 - **Avani Lekhara** =
 - Won gold in the women's R2 10m air rifle standing SH1 event at the Tokyo 2020 Paralympics.
 - Won gold at the Paris 2024 Paralympics.
 - **Manish Narwal** =
 - Won gold in the mixed 50m pistol at the Tokyo 2020 Paralympics.
 - Won silver in the men's P1 10m air pistol at the Paris 2024 Paralympics.
 - **Singhraj Adhana**
 - **Mona Agarwal**
 - **Rubina Francis**

Explanation:

Q. 59	<p>Sher khan defeated Humayun in the battle of Chausa and Kannauj and forced him to flee to_____ .</p> <p>a) Turkey <input checked="" type="checkbox"/> X</p> <p>b) Iraq <input checked="" type="checkbox"/> X</p> <p>c) Iran <input checked="" type="checkbox"/> ✓</p> <p>d) Uzbekistan <input checked="" type="checkbox"/> X</p>
<p>Explanation:</p>	<p>Correct answer = Option 3 (Iran)</p> <p><u>Sher Shah Suri:</u></p> <ul style="list-style-type: none">• Original Name = Farid Khan.• Belonged to the Sur clan, an ethnic Pashtun (Afghan) tribe.• The title "Sher Khan" (Lion Lord).• Battle of Chausa (June 26, 1539) = Sher Khan defeated Humayun.• Battle of Kannauj (Battle of Bilgram) (May 17, 1540) =<ul style="list-style-type: none">◦ Shah confronted Humayun near Kannauj (modern Uttar Pradesh).◦ Established Sher Shah's rule over Delhi.◦ The beginning of the Sur Empire.• Battle of Surajgarh (1533) = Sher Shah defeated the combined forces of the Lohani chiefs of Bihar and Mahmud Shah of Bengal.• Died – 1545 in KALINJAR Fort• Mausoleum in Sasaram , Bihar <p><u>Humayun (1508-1556):</u></p> <ul style="list-style-type: none">• Full Name = Nasir al-Din Muhammad• Humayun died in January 1556 due to a fall from the stairs of his library.• He commissioned the construction of Dinpanah (Refuge of the Faith) in Delhi.

Q. 60	<p>During the Raja festival, womanhood is celebrated. In which Indian state is this festival extremely popular?</p> <p>a) Kerala </p> <p>b) Odisha </p> <p>c) Maharashtra </p> <p>d) West Bengal </p>
<p>Explanation:</p> <p>Correct answer = Option 2 (Odisha)</p> <p><u>Some other womanhood festival:</u></p> <ul style="list-style-type: none"> • Manjal Neerattu Vizha (Tamil Nadu) = <ul style="list-style-type: none"> ◦ A turmeric bathing ceremony celebrated by women for nine days, to mark a girl's transition into womanhood. ◦ The girl puts on a beautiful saree and gold jewellery. • Ritushuddhi or Ritu Kala Samskara (Karnataka) = <ul style="list-style-type: none"> ◦ Ceremony that celebrates a girl's transition to womanhood. ◦ This is also when she receives her very first saree. ◦ During 'the half-saree function' the girl puts on a half-saree for the first time in her life. ◦ Marks a girl's coming-of – age after her first menstruation. • Maasika Mahotsav (Maharashtra, Tamil Nadu, West Bengal, Gujarat, and Uttar Pradesh) = <ul style="list-style-type: none"> ◦ To raise awareness and make menstruation a part of everyday conversations <p><u>States & their festivals =</u></p> <ul style="list-style-type: none"> • Kerala = Theyyam, Attukal Pongala, Thrissur Pooram, Vishu, Nehru Trophy Boat Race, Vetta and Arattu • Odisha = Dola Purnima, Chandan Yatra, Dhanu Yatra, Raja Parba (Mithuna Sankranti), Nuakhai, Bali Yatra • Maharashtra = Narali Purnima, Kalidas Festival, Pola, Ellora-Aurangabad Festival • West Bengal = Poila Baisakh, Dol Yatra (Holi), Nabanna, Poush Mela, Gajan, Jamai Shoshti, Bhai Phota, National Theatre Festival 	

Q. 61	<p>Which of the following countries borders India to the north-west?</p> <p>a) Myanmar and Nepal </p> <p>b) Afghanistan and Pakistan </p> <p>c) Bangladesh and Myanmar </p> <p>d) China, Bhutan and Nepal </p>
Explanation:	<p>Correct answer = Option 2 (Afghanistan and Pakistan)</p> <p><u>Countries Borders India: 7</u></p> <ul style="list-style-type: none"> • Myanmar = <ul style="list-style-type: none"> o States of India share borders (Total 4) = Arunachal Pradesh, Nagaland, Manipur, and Mizoram o Myanmar is located to the east of India. • Nepal = <ul style="list-style-type: none"> o Nepal is situated to the north of India. o States of India share borders (Total 5) = Uttarakhand, Uttar Pradesh, Bihar, West Bengal, and Sikkim • Afghanistan = <ul style="list-style-type: none"> o India shares a small border with Afghanistan. o This border is located in the north-western part of India. o The border is defined by the Durand Line. • Pakistan = <ul style="list-style-type: none"> o Pakistan shares a border with India to its north-west and west. o States and union territories share borders = Jammu and Kashmir, Ladakh, Punjab, Rajasthan, and Gujarat border Pakistan. • Bangladesh = <ul style="list-style-type: none"> o Bangladesh is located to the east of India. o States of India share borders (Total 5) = West Bengal, Assam, Meghalaya, Tripura, and Mizoram. • China = <ul style="list-style-type: none"> o China shares a long northern and northeastern border with India. o States & union territory share borders = Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh border China. • Bhutan = <ul style="list-style-type: none"> o Bhutan is located to the northeast of India. • States of India share borders (Total 4) = Sikkim, West Bengal, Assam, and Arunachal Pradesh.

Q. 62	<p>What is the minimum age for a person to be considered literate in the Indian Census?</p> <p>a) 5 years </p> <p>b) 7 years </p> <p>c) 10 years </p> <p>d) 15 years </p>
<p>Explanation:</p> <p>Correct Answer = Option 2 (7 years)</p> <ul style="list-style-type: none">Literacy is defined as the ability to read and write with understanding in any language. <p>Minimum Age Criteria in India –</p> <ul style="list-style-type: none">Right to Vote (Elections)<ul style="list-style-type: none">Minimum Age: 18 yearsAs per 61st Constitutional Amendment Act, 1988, the voting age was reduced from 21 to 18 years.Membership of Legislative Bodies<ul style="list-style-type: none">Lok Sabha (MP): 25 yearsRajya Sabha (MP): 30 yearsState Legislative Assembly (MLA): 25 yearsLegislative Council (MLC): 30 yearsPresident & Vice President of India<ul style="list-style-type: none">President: 35 yearsVice President: 35 yearsPrime Minister / Chief Minister<ul style="list-style-type: none">Minimum Age: 25 yearsPanchayati Raj Institutions (as per 73rd Amendment)<ul style="list-style-type: none">Minimum Age: 21 years (varies slightly by state for panchayat elections)Employment (Under Child Labour Law)<ul style="list-style-type: none">Minimum Age to Work in Non-Hazardous Jobs: 14 yearsMinimum Age for Hazardous Jobs: 18 yearsAdmission to School (RTE Act, 2009)<ul style="list-style-type: none">Minimum Age for Class I: 6 years (varies in some states)Contesting Gram Panchayat Elections<ul style="list-style-type: none">Minimum Age: 21 years	

Q. 63	<p>Which of the following was the most prominent port during the Sangam Age?</p> <p>a) Kanchipuram </p> <p>b) Madurai </p> <p>c) Puhar </p> <p>d) Tanjavur </p>
Explanation:	<p>Correct Answer = Option 3 (Puhar)</p> <ul style="list-style-type: none"> • Puhar (also known as Kaveripattinam) was the chief port city of the Cholas during the Sangam Age. <ul style="list-style-type: none"> ○ Located at the mouth of the Kaveri River, it was a major center of trade, especially maritime trade with Southeast Asia and Rome. ○ It finds detailed description in the Sangam epic Silappatikaram, showcasing its importance in trade, architecture, and urban planning. • Kanchipuram = Important later under Pallavas. • Madurai = Capital of the Pandyas, known for literature and culture. • Tanjavur = Became important later under Cholas (medieval period).
Q. 64	<p>Which of the following locations is known for lignite coal production?</p> <p>a) Neyveli </p> <p>b) Talcher </p> <p>c) Bokaro </p> <p>d) Korba </p>
Explanation:	<p>Correct Answer = Option 1 (Neyveli)</p> <ul style="list-style-type: none"> • Neyveli, located in Tamil Nadu, is India's largest lignite coal reserve. • Lignite, also called brown coal, is a soft coal with lower carbon content and high moisture. • Talcher (Odisha): Known for thermal coal (bituminous). • Bokaro (Jharkhand): Major center for bituminous coal used in steel production. • Korba (Chhattisgarh): Rich in thermal coal, powering several power plants.

Q. 65	<p>What kind of depositional landforms are formed when streams flowing from higher levels break into foot slope plains of low gradient?</p> <p>a) Point bars </p> <p>b) Flood plains </p> <p>c) Alluvial fans </p> <p>d) Natural levees </p>
Explanation:	<p>Correct Answer = Option 3 (Alluvial fans)</p> <ul style="list-style-type: none"> • Alluvial fans are fan- or cone-shaped depositional features formed where a high-gradient stream loses energy and spreads out onto a flatter plain, depositing sediments. <ul style="list-style-type: none"> o These typically occur at the base of mountain ranges, where streams exit narrow valleys and enter low-gradient areas. o The decrease in velocity causes sediments like gravel, sand, and silt to be deposited in a fan-shaped pattern. <p>• Point bars: Formed inside meander bends of rivers — associated with lateral erosion and deposition.</p> <p>• Flood plains: Formed by overbank flooding of rivers — consist of fine sediments spread over a wide area.</p> <p>• Natural levees: Raised banks along rivers formed by successive floods depositing heavier sediments near the channel.</p>

Q. 66	<p>According to which of the following Articles of the Constitution of India shall a Money Bill NOT be introduced in the Council of States?</p> <p>a) Article 109 </p> <p>b) Article 298 </p> <p>c) Article 354 </p> <p>d) Article 193 </p>
Explanation:	<p>Correct Answer = Option 1 (Article 109)</p> <ul style="list-style-type: none"> • Article 109 = Deals with the special process for Money Bills. <ul style="list-style-type: none"> o It states that Money Bills can only be introduced in the Lok Sabha (House of the People) and cannot be introduced in the Rajya Sabha (Council of States). o The Rajya Sabha has limited powers over Money Bills and can only make recommendations within 14 days. • Article 298 = Relates to the power of the Union and States to carry on trade or business, and to acquire, hold, and dispose of property. • Article 354 = Deals with the application of provisions relating to the distribution of revenues while a Proclamation of Emergency is in operation. • Article 193 = Pertains to the penalty for sitting and voting in a State Legislature before making oath or affirmation, or when not qualified or when disqualified.

Q. 67	<p>In the 2023-24 Union Budget of the Government of India, which scheme or package program was introduced to benefit traditional artisans and craftspeople?</p> <p>a) PM VIJET </p> <p>b) PM SHREE </p> <p>c) PM VISHWAS </p> <p>d) PM VIKAS </p>
Explanation:	<p>Correct Answer = Option 4 (PM VIKAS)</p> <p>PM SHREE = Stands for Pradhan Mantri Schools for Rising India</p> <ul style="list-style-type: none">• It's a centrally sponsored scheme launched in 2022 to upgrade existing schools to showcase the NEP 2020. <p>PM VIKAS = Stands for Pradhan Mantri Vishwakarma Kaushal Samman.</p> <ul style="list-style-type: none">• This is the scheme announced in the Union Budget 2023-24 to support traditional artisans and craftspeople (Vishwakarmas) by providing skill development, financial assistance, modern tools, and market linkages.

Q. 68	<p>_____ are amoeboids (amoeba-like movement, with pseudopodia) that can squeeze out through capillary walls.</p> <p>a) White blood cells ✓</p> <p>b) Red blood cells ✗</p> <p>c) Guard cells ✗</p> <p>d) Nerve cells ✗</p>
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Correct Answer = Option 1 (White blood cells)

White blood cells (Leukocytes):

- Body's defense system, fighting infections and diseases.
- Produced in bone marrow.
- **Main Types (5)-**
 - **Neutrophils:** First responders, fight bacteria via phagocytosis.
 - **Lymphocytes:** Key for adaptive immunity (B cells make antibodies, T cells kill infected cells).
 - **Monocytes:** Differentiate into macrophages, perform phagocytosis, present antigens.
 - **Eosinophils:** Fight parasites, involved in allergies.
 - **Basophils:** Release histamine, involved in allergic reactions.
- **High WBC count**, often due to infection/inflammation or **leukemia**.
- **Low WBC count**, can indicate bone marrow issues, severe infections, or autoimmune diseases.
- These are the cells of the immune system.
- They are capable of amoeboid movement, using temporary projections of their cytoplasm (pseudopodia) to move around.

Red blood cells (Erythrocytes):

- Carry oxygen from lungs to body using **Hemoglobin**.
- **Live about 120 days**.
- **Low count:** Anemia (less oxygen carried)
- **High count:** Polycythemia (blood gets too thick)

Guard cells:

- These are specialized cells found in the epidermis of plant leaves, surrounding the stomata (pores).
- They are not found in animal blood and do not exhibit amoeboid movement.

Nerve cells (Neurons):

- These cells are specialized for transmitting electrical and chemical signals.
- They have distinct, fixed structures and do not exhibit amoeboid movement.

Q. 69	<p>A person of height 180 cm stands in front of a plane mirror to see their full image. Which of the following statements is correct regarding the minimum size of the mirror required and its placement?</p> <p>a) The mirror must have a height of 180 cm, and its top edge must be level with the person's eyes. X</p> <p>b) The mirror must have a height of 90 cm, and its top edge must be level with the person's eyes. X</p> <p>c) The mirror must have a height of 90 cm, and its top edge must be positioned halfway vertically between the person's eye level and the top of their head. ✓</p> <p>d) The mirror must have a height of 180 cm, and its bottom edge must be level with the person's feet. X</p>
Explanation:	<p>Correct Answer = Option 3 (The mirror must have a height of 90 cm, and its top edge must be positioned halfway vertically between the person's eye level and the top of their head.)</p> <ul style="list-style-type: none"> To see one's full image in a plane mirror, the minimum vertical height of the mirror required is half the height of the person i.e. 90 cm. <p>Placing-</p> <ul style="list-style-type: none"> Seeing the top of the head: To see the top of your head, the light reflecting off the mirror towards your eye hits the mirror at a point exactly halfway vertically between the top of your head and your eye level. Therefore, the top edge of the mirror must be at this halfway position. Seeing the feet: Similarly, to see your feet, light reflects from the mirror to your eye. The reflection point is halfway vertically between your feet and your eye level. Thus, the mirror's bottom edge must be at this halfway position. <p>The total required height of the mirror is the distance between these two reflection points (the top and bottom edges of the mirror). Since the top edge is halfway between the eye and the top of the head, and the bottom edge is halfway between the eye and the feet, the total height of the mirror is half the total height of the person.</p> <ul style="list-style-type: none"> Therefore, the minimum height of the mirror is 90 cm, and its top edge must be positioned halfway vertically between the person's eye level and the top of their head.

Q. 70	<p>Which of the following sets of elements is arranged in order of increasing metallic character?</p> <p>a) Na < Mg < S < Cl X</p> <p>b) Cl < S < Mg < Na ✓</p> <p>c) S < Cl < Na < Mg X</p> <p>d) Mg < Na < Cl < S X</p>
<p>Explanation:</p> <p>The elements given (Na, Mg, S, Cl) are all in Period 3 of the Periodic Table. Their positions from left to right are-</p> <ul style="list-style-type: none">• Sodium (Na) - Group 1 (Alkali Metal)• Magnesium (Mg) - Group 2 (Alkaline Earth Metal)• Sulfur (S) - Group 16 (Chalcogen, Non-metal)• Chlorine (Cl) - Group 17 (Halogens, Non-metal) <p>The order of decreasing metallic character among these elements is- Na > Mg > S > Cl</p> <p>Therefore, the order of increasing metallic character is-</p> <p>Cl < S < Mg < Na</p>	<p>Correct Answer = Option 2 (Cl < S < Mg < Na)</p> <ul style="list-style-type: none">• Metallic Character = The tendency of an atom to lose electrons and form positive ions (cations). <p>Metallic character in the Periodic Table-</p> <ul style="list-style-type: none">• Across a Period (Left to Right) = Metallic character decreases because increased nuclear pull and smaller atomic size hold outer electrons more tightly, making them harder to lose.• Down a Group (Top to Bottom) = Metallic character increases because adding electron shells increases atomic radius and shielding, making the valence electrons further away and less tightly held, thus easier to remove.

Q. 71	<p>The Ranji Trophy is a prominent domestic sports competition in India. This trophy is awarded in which specific format of cricket?</p> <p>a) Twenty20 (T20) Cricket </p> <p>b) One Day International (ODI) Cricket </p> <p>c) First-Class Cricket </p> <p>d) Test Cricket </p>
<p>Explanation:</p> <p>Correct Answer = Option 3 (First-Class Cricket)</p> <ul style="list-style-type: none">• Ranji Trophy is specifically associated with the First-Class format of cricket. <p>Ranji Trophy</p> <ul style="list-style-type: none">• Named after the famous cricketer K. S. Ranjitsinhji.• It is the premier domestic First-Class Cricket championship played in India.• It involves state and regional teams across India competing in this traditional, longer format of the game.<ul style="list-style-type: none">◦ The first winner of the Ranji Trophy, in the inaugural (1934-1935) = Bombay◦ The winner of the Ranji Trophy (2024-2025) = Vidarbha <p>First-class cricket matches = Multi-day matches, typically played over four or five days, with two innings per side.</p> <ul style="list-style-type: none">• Twenty20 (T20) Cricket: This is a shorter format of the game (around 3-4 hours).<ul style="list-style-type: none">◦ Ex- Syed Mushtaq Ali Trophy, Indian Premier League (IPL)• One Day International (ODI) Cricket: This is a limited-overs (50) format played between international teams, not a domestic Indian tournament. Domestic one-day tournaments in India are different (e.g., Vijay Hazare Trophy).• Test Cricket: This is the longest and highest standard format of the sport of cricket.	

Q. 72	<p>The Sangai, an endangered subspecies of Eld's deer, is unique as it is found only in a specific floating habitat. In which National Park is the last natural habitat of the Sangai exclusively located?</p> <p>a) Jim Corbett National Park </p> <p>b) Keibul Lamjao National Park </p> <p>c) Kaziranga National Park </p> <p>d) Silent Valley National Park </p>
Explanation:	<p>Correct Answer = Option 2 (Keibul Lamjao National Park)</p> <ul style="list-style-type: none"> • The Sangai deer, the state animal of Manipur, is found exclusively in the Keibul Lamjao National Park. • Keibul Lamjao National Park is the world's only floating national park. • It is characterized by phumdis, which are heterogeneous masses of vegetation, soil, and organic matter floating on the surface of Loktak Lake in Manipur. <p>Jim Corbett National Park:</p> <ul style="list-style-type: none"> • Located in Uttarakhand. • Established in 1936. • It was originally named Hailey National Park. • It's famous for tigers and is India's oldest national park. • It was the first park to be included under Project Tiger (1973) initiative. • The Ramganga River flows through the park <p>Kaziranga National Park:</p> <ul style="list-style-type: none"> • Located in Assam • It is famous for the Great Indian One-Horned Rhinoceros. • It was inscribed as a UNESCO World Heritage Site in 1985. • Located on the banks of the Brahmaputra River <p>Silent Valley National Park:</p> <ul style="list-style-type: none"> • Located in the Nilgiri Hills in the state of Kerala. • It is known for its rich biodiversity and tropical rainforest ecosystem. • It is part of the Western Ghats which was designated as a UNESCO World Heritage Site in 2012. • The Kunthipuzha River flows through the valley.

Q. 73	<p>The Vienna Convention is a significant international treaty related to environmental protection. What is the primary objective of the Vienna Convention?</p> <p>a) To regulate international trade in endangered species of wild fauna and flora. X</p> <p>b) To control transboundary movements of hazardous wastes and their disposal. X</p> <p>c) To serve as a framework convention for efforts to protect the Earth's ozone layer. ✓</p> <p>d) To combat desertification and mitigate the effects of drought. X</p>
Explanation:	<p>Correct Answer = Option 3 (To serve as a framework convention for efforts to protect the Earth's ozone layer.)</p> <p>The Vienna Convention (1985)-</p> <ul style="list-style-type: none">• For the Protection of the Ozone Layer.<ul style="list-style-type: none">◦ Ozone Day = 16 September• Its primary objective is to promote cooperation among countries on research, monitoring, and information exchange regarding the depletion of the ozone layer and its effects. <p>Montreal Protocol (1987)-</p> <ul style="list-style-type: none">• To phase out the production and consumption of Ozone Depleting Substances (ODS), such as Chlorofluorocarbons (CFCs), Halons, Carbon Tetrachloride, and Methyl Chloroform.<ul style="list-style-type: none">◦ Kigali Amendment (2016) <p>Kyoto Protocol (1997)-</p> <ul style="list-style-type: none">• To combat climate change by setting binding targets for industrialized countries for reducing Greenhouse Gas (GHG) emissions.

Q. 74	<p>Who is the author of the book Life on Mars: Collected Stories?</p> <p>a) Ruskin Bond </p> <p>b) Arundhati Roy </p> <p>c) Namita Gokhale </p> <p>d) Jhumpa Lahiri </p>
<p>Correct Answer = Option 3 (Namita Gokhale)</p> <p>Notable Books by Indian Writers-</p> <ul style="list-style-type: none"> • Rosarita = Anita Desai • Many Ramayanas, Many Lessons = Anand Neelakantan • The Diary of a Cricketer's Wife: A Very Unusual Memoir = Puja Pujara • Sing, Dance and Lead = Hindol Sengupta • Mahabharat 2025: The Secrets of Shunya = Divyansh Mundra • Fortune Seekers: A Business History of the Nattukottai Chettiar = Raman Mahadevan • Ramayanam: Vol I = Dushyanth Sridhar • Indira Gandhi and the Years That Transformed India = Srinath Raghavan • Wild Fictions (Essays) = Amitav Ghosh • Mother Mary Comes to Me = Arundhati Roy (Anticipated) • Badass Begums = Anoushka Jain • Learning from Silence = Pico Iyer • The Himalaya in a Small House = Anuradha Roy • The World After Gaza = Pankaj Mishra • The Tamils: A Portrait of a Community = Nirmala Lakshman • The Circle of Life = Sudha Murty (Anticipated) • The Constitution of India - A Short History = Shashi Tharoor (Anticipated) • Once Elephants Lived Here (Short Stories) = Geetanjali Shree (Translated by Daisy Rockwell) • Lords of Earth and Sea: A History of the Chola Empire = Anirudh Kanisetti • Loal Kashmir = Mehak Jamal 	

Q. 75	<p>When is the International Day of Women and Girls in Science observed annually?</p> <p>a) 8 March </p> <p>b) 11 February </p> <p>c) 10 November </p> <p>d) 14 February </p>
<p>Correct Answer = Option 2 (11 February)</p> <p>Important Days and Theme 2025-</p> <ul style="list-style-type: none"> • International Day of Women and Girls in Science is celebrated on 11 February. <ul style="list-style-type: none"> ◦ Theme = Unpacking STEM careers: Her Voice in Science • Indian Coast Guard Day = 01 February • World Wetlands Day = 02 February <ul style="list-style-type: none"> ◦ Theme = Protecting Wetlands for Our Common Future • World Cancer Day =] 04 February <ul style="list-style-type: none"> ◦ Theme = United by unique. • World Pulses Day = 10 February <ul style="list-style-type: none"> ◦ Theme= Pulses: Bringing diversity to agrifood systems • International Day of Women and Girls in Science = 11 February <ul style="list-style-type: none"> ◦ Theme = Unpacking STEM careers: Her Voice in Science <p>Explanation:</p> <ul style="list-style-type: none"> • World Radio Day = 13 February <ul style="list-style-type: none"> ◦ Theme = Radio and Climate change • World Day of Social Justice = 20 February <ul style="list-style-type: none"> ◦ Theme = Empowering Inclusion: Bridging Gaps for Social Justice • International Mother Language Day = 21 February <ul style="list-style-type: none"> ◦ Theme = Language Matters: Silver Jubilee Celebration of International Mother Language Day • World NGO Day = 27 February <ul style="list-style-type: none"> ◦ Theme: Empowering Grassroots Movements for a Sustainable Future • Rare Disease Day = 28 February <ul style="list-style-type: none"> ◦ Theme: More than you can imagine; an anthology of rare experiences • National Science Day= 28 February <ul style="list-style-type: none"> Theme : Empowering Indian Youth for Global Leadership in Science & Innovation for VIKSIT BHARAT. 	

Q. 76

If $A = 0.\underline{497}$, $B = 0.\underline{299}$ and $C = 0.\underline{129}$, then what is the value of $(A + B + C)$? (Approx.)

- a) $911/1000$ X
- b) $93/100$ ✓
- c) $953/1000$ X
- d) $95/100$ X

Explanation:

$$\begin{aligned} 1. \quad A &= 0.\underline{497} & B &= 0.\underline{299} & C &= 0.\underline{129} \\ 10A &= 4.9797\ldots & 10B &= 2.9999\ldots & 100C &= 12.999\ldots \\ 1000A &= 497.97\ldots & 1000B &= 299.99\ldots & 1000C &= 129.99\ldots \\ \Rightarrow 990A &= 493 & 990B &= 297 & 900C &= 117 \\ A &= \frac{493}{990} & B &= \frac{297}{990} & C &= \frac{117}{900} \\ & & B &= \frac{3}{10} & & \\ & & & & C &= \frac{13}{100} \end{aligned}$$

$$\begin{aligned} \text{Now, } A+B+C &= \frac{493}{990} + \frac{3}{10} + \frac{13}{100} \\ &= \frac{987}{990} \approx 0.93 = \frac{93}{100} \end{aligned}$$

Q. 77

The average age of 8 members of a family is 27 years. If the youngest member is 2 years old, then what was the average age of the family just before the birth of the youngest member?

- a) 29.58 X
- b) 25 X
- c) 27.9 X
- d) 28.57 ✓

Explanation:

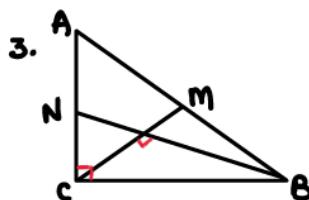
$$\begin{aligned} 2. \quad \text{Average age of 8 members} &= 27 \\ \frac{\text{Sum of ages of 8 members}}{8} &= 27 \\ \text{Sum of ages of 8 members} &= 216 \end{aligned}$$

$$\begin{aligned} \text{Sum of ages of 7 members 2 yr back,} \\ \text{before the birth of youngest member} \\ &= 216 - 8 \times 2 \\ &= 216 - 16 = 200 \\ \text{Avg. Age of 7 members} &= \frac{200}{7} \\ &= 28.57 \end{aligned}$$

Q. 78

In a triangle ABC, $\angle C = 90^\circ$, M and N are the midpoint of AB and AC. CM and BN are intersect at point D. If $\angle BDC = 90^\circ$ and BC=8 cm, then find the length of BN?

- a) $4\sqrt{6}$ ✓
- b) $2\sqrt{6}$ ✗
- c) $6\sqrt{4}$ ✗
- d) $6\sqrt{3}$ ✗



centroid divides median in
the ratio of 2:1

$$BD : DN = 2x : x$$

In $\triangle CDB$ and $\triangle NBC$,
 $\angle CBD = \angle NBC$ (common)
 $\angle D = \angle C$ (90°)
 $\therefore \triangle CDB \sim \triangle NBC$ (AA similarity)

Explanation:

$$\begin{aligned} \Rightarrow \frac{BN}{BC} &= \frac{BC}{DB} \\ \Rightarrow BC^2 &= BN \cdot DB \\ \Rightarrow (8)^2 &= 3x \cdot 2x \\ \Rightarrow 64 &= 6x^2 \\ \Rightarrow x^2 &= \frac{64}{6} \\ \Rightarrow x &= \frac{8}{\sqrt{6}} \\ \Rightarrow BN &= 3x \\ &= 3 \times \frac{8}{\sqrt{6}} \\ &= \frac{24}{\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}} \\ &= 4\sqrt{6}. \end{aligned}$$

Q. 79

If $\cos 53^\circ = \frac{x}{y}$, then $\sec \sec 53^\circ + \cot \cot 37^\circ$ is equal to:

- a) $\frac{x+\sqrt{y^2-x^2}}{y}$ X
- b) $\frac{x+\sqrt{y^2-x^2}}{x}$ X
- c) $\frac{y+\sqrt{y^2-x^2}}{x}$ ✓
- d) $\frac{y+\sqrt{y^2-x^2}}{y}$ X

Explanation:

$$\begin{aligned}
 4. \quad \cos 53^\circ &= \frac{x}{y} \\
 \sec 53^\circ + \cot 37^\circ &= \frac{1}{\cos 53^\circ} + \cot(90^\circ - 53^\circ) \\
 &= \frac{1}{\frac{x}{y}} + \tan 53^\circ \quad [\because \sec \theta = \frac{1}{\cos \theta}] \\
 &= \frac{y}{x} + \frac{\sin 53^\circ}{\cos 53^\circ} \quad [\because \sin \theta = \sqrt{1 - \cos^2 \theta}] \\
 &= \frac{y}{x} + \frac{\sqrt{1 - \cos^2 53^\circ}}{\cos 53^\circ} \\
 &= \frac{y}{x} + \frac{\sqrt{1 - (x/y)^2}}{x/y} \\
 &= \frac{y}{x} + \frac{y}{x} \frac{\sqrt{y^2 - x^2}}{y} \\
 &= \frac{y + \sqrt{y^2 - x^2}}{x}
 \end{aligned}$$

Q. 80

By selling a water heater for 680, the shopkeeper incurs a loss of 15%. If he wants to earn a profit of 10%, at what price should he sell the water heater?

- a) 880 ✓
- b) 910 ✗
- c) 935 ✗
- d) 860 ✗

Explanation:

$$\begin{aligned}
 & \text{5. let } CP = 100x \\
 & \text{At Q, } 100x - 15\% = 680 \\
 & \Rightarrow 100x - \frac{15}{100} \times 100x = 680 \\
 & \Rightarrow 85x = 680 \\
 & \Rightarrow x = \frac{680}{85} \\
 & \text{If He wants to earn} \\
 & \text{Profit of } 10\%, SP = 110x \\
 & \therefore SP = 110x \\
 & = 110 \times \frac{680}{85} \\
 & = ₹ 880
 \end{aligned}$$

Q. 81

A, B and C started a business by investing Rs. 1600, Rs. 2000 and Rs. 1800 respectively. 6 months after the start of business. A invested Rs. 200 more, the start of business after 8 months, B and C invested additional capital in the ratio of 4: 1. If C gets an annual profit of Rs. 3780 and A's share in the profit is Rs. 1080 then how much extra amount did C invest?

- a) 400 X
- b) 270 ✓
- c) 200 X
- d) 300 X

6. B and C invested additional amount in the ratio 4:1
let common factor between them be 'x'.

	A	B	C
Inv.	1600	2000	1800
Time	6	8	8
Inv.	1800	(2000+4x)	(1800+x)
Time	6	4	4

$$\begin{aligned} A &= 1600 \times 6 + 1800 \times 6 \\ &= 9600 + 10800 = 20400 \end{aligned}$$

$$\begin{aligned} B &= 2000 \times 8 + (2000+4x) \times 4 \\ &= 24000 + 16x \end{aligned}$$

$$\begin{aligned} C &= 1800 \times 8 + (1800+x) \times 4 \\ &= 21600 + 4x \end{aligned}$$

$$\frac{A}{A+B+C} = \frac{1080}{3780}$$

$$\Rightarrow \frac{10200}{20400} = \frac{108}{378}$$

$$\Rightarrow 10200 \times 7 = 20x + 66000$$

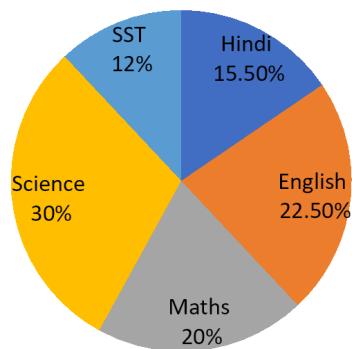
$$\Rightarrow 71400 - 66000 = 20x$$

$$\Rightarrow x = 270$$

Explanation:

Q. 82

The given pie-chart shows the distribution of the marks scored by Ram in five different subjects (in percentage).



What is the ratio of the central angle of Maths to the central angle of Science?

- a) 5:2 X
- b) 2:3 ✓
- c) 4:3 X
- d) 3:5 X

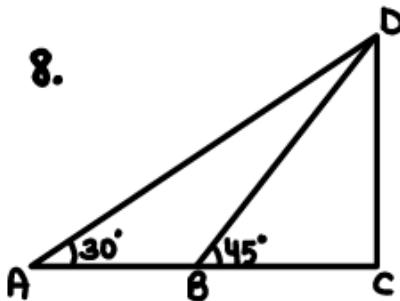
Explanation:

$$\text{7. } \frac{\text{central angle of Maths}}{\text{central angle of Science}} = \frac{20\%}{30\%}$$
$$= \frac{\frac{20}{100} \times 360}{\frac{30}{100} \times 360}$$
$$= 2 : 3$$

Q. 83

The angles of elevation of the top of a tree 220 metre high from two points lie on the same plane are 30° and 45° . What is the distance (in metres) between the two points?

- a) 161.05 ✓
- b) 193.22 ✗
- c) 170.25 ✗
- d) 144.25 ✗



$$\text{Tree} = CD = 220 \text{ m}$$

In $\triangle BCD$,

$$\tan 45^\circ = \frac{DC}{BC}$$

$$\Rightarrow 1 = \frac{220 \text{ m}}{BC}$$

$$\Rightarrow BC = 220 \text{ m}$$

Explanation:

In $\triangle ADC$

$$\tan 30^\circ = \frac{DC}{AC}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{220}{AC}$$

$$\Rightarrow AC = 220\sqrt{3} \text{ m}$$

Distance between 2 points

$$AB = AC - BC$$

$$= 220\sqrt{3} - 220$$

$$= 220(\sqrt{3} - 1)$$

$$= 220(1.732 - 1)$$

$$= 220 \times 0.732$$

$$= 161.04 \text{ m}$$

Q. 84

Eight refrigerators and Nine mobile phones together cost Rs. 160500 while Five refrigerators and Four mobile phones together cost Rs. 93000. The cost (in Rs.) of two refrigerator and two mobile phones is:

- a) 35000
- b) 19500
- c) 39000
- d) 18000

Explanation:

g. let the cost of 1 refrigerator be ' r '
let the cost of 1 mobile be ' m '

$$\text{A/q, } 8r + 9m = 160500 \quad \text{--- (1)}$$

$$5r + 4m = 93000 \quad \text{--- (2)}$$

Multiplying eqⁿ(2) by $\frac{8}{5}$ we get -

$$8r + \frac{32}{5}m = 148800 \quad \text{--- (3)}$$

Subtracting eqⁿ(3) from eqⁿ(1) we get

$$8r + 9m - \left(8r + \frac{32}{5}m \right) = 160500 - 148800$$

$$\Rightarrow \frac{13m}{5} = 11700$$

$$\Rightarrow m = 4500$$

Putting $m = 4500$ in eqⁿ(3),

$$8r + \frac{32}{5} - 4500 = 148800$$

$$\Rightarrow 8r = 148800 - 28800$$

$$\Rightarrow 8r = 120000$$

$$\Rightarrow r = 15000$$

$$\therefore 2r + 2m = 30,000 + 9000 \\ = 39,000$$

Q. 85	<p>The population of a city was 8000000 in 2022. The population grows 12.5% annually. The population in 2024 will be:</p> <p>a) 11750000 X</p> <p>b) 12510000 X</p> <p>c) 11250000 X</p> <p>d) 10125000 ✓</p>
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Explanation:	$10. \quad 12.5\% = \frac{1}{8}$ Population grows 12.5% annually $\Rightarrow 1 + \frac{1}{8} = \frac{9}{8}$ $800 \times 10^4 \times \frac{9}{8} \times \frac{9}{8} = \frac{25 \times 9 \times 9 \times 10^4}{2}$ $= 10125000$
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Q. 86	<p>How many natural numbers are there between 1000 and 2500 which when divided by 405 leaves the remainder 5?</p> <p>a) 5 X</p> <p>b) 2 X</p> <p>c) 4 ✓</p> <p>d) 3 X</p>
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Explanation:	<p>11. The number will be of the form $N = 405x + 5$ Remainder 'x' can be any whole number $1000 < N < 2500$ $\Rightarrow 1000 < 405x + 5 < 2500$ $\Rightarrow 995 < 405x < 2495$</p> $\begin{aligned} 995 < 405x &\quad 405x < 2495 \\ \Rightarrow \frac{995}{405} < x &\quad \Rightarrow x < \frac{2495}{405} \\ \Rightarrow 2.45 < x &\quad \Rightarrow x < 6.16 \\ \Rightarrow x = 3, 4, 5, 6 & \\ N = 405x + 5 & \\ N = 1225, 1625, 2025, 2435 & \\ \therefore \text{There are 4 possible values of } N. & \end{aligned}$
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Q. 87

Solve the equation:

$$\frac{32\cos^6x - 48\cos^4x + 18\cos^2x - 1}{4\sin(x)\cos(x)\sin(60-x)\sin(60+x)\cos(60-x)\cos(60+x)}$$

a) $4\sin 6x$ X

b) $8\tan 6x$ X

c) $4\cos 6x$ X

d) $8\cot 6x$ ✓

Explanation:

$$\begin{aligned}
 & 12. \frac{32\cos^6x - 48\cos^4x + 18\cos^2x - 1}{4\sin x \cdot \cos x \cdot \sin(60-x) \cdot \sin(60+x) \cdot \cos(60-x) \cdot \cos(60+x)} \\
 & \Rightarrow \frac{2(16\cos^6x - 24\cos^4x + 9\cos^2x) - 1}{4 \cdot \frac{1}{4} \sin 3x \cdot \frac{1}{4} \cos 3x} \quad [\because \sin \theta \sin(\theta-60) \sin(\theta+60) = \sin 3\theta] \\
 & \Rightarrow \frac{4[2(4\cos^3x - 3\cos x)^2 - 1]}{\sin 3x \cdot \cos 3x} \quad [\because \cos \theta \cos(\theta-60) \cos(\theta+60) = \cos 3\theta] \\
 & \Rightarrow \frac{8\cos^2 3x - 4}{\sin 3x \cdot \cos 3x} \quad [\because 4\cos^3 A - 3\cos A = \cos 3A] \\
 & \Rightarrow \frac{4(2\cos^2 3x - 1)}{\sin 3x \cdot \cos 3x} \quad [\because 2\cos^2 A - 1 = \cos 2A] \\
 & \Rightarrow \frac{4 \cdot \cos 6x}{\sin 3x \cdot \cos 3x} \\
 & \Rightarrow \frac{2 \cdot 4 \cos 6x}{2 \cdot \sin 3x \cdot \cos 3x} \quad [\because 2 \sin A \cdot \cos A = \sin 2A] \\
 & \Rightarrow \frac{8 \cos 6x}{\sin 6x} \\
 & \Rightarrow 8 \cot 6x
 \end{aligned}$$

Q. 88

If $a + b + c = 0$, $a^2 + bc = 5$, $b^2 + ac = -1$, $c^2 + ba = -1$, find $\frac{5a-b-c}{abc}$?

a) $9/2$ Xb) -1 Xc) 6 ✓d) 0 X

$$\begin{aligned} \text{13. } a^2 + bc &= 5 \quad (1) \\ b^2 + ac &= -1 \quad (2) \\ c^2 + ba &= -1 \quad (3) \end{aligned}$$

Multiplying eqⁿ (1) by a
 eqⁿ (2) by b
 eqⁿ (3) by c

$$\begin{aligned} \Rightarrow a^3 + abc &= 5a \quad (4) \\ b^3 + abc &= -b \quad (5) \\ c^3 + abc &= -c \quad (6) \end{aligned}$$

Adding eqⁿ (4), (5) & (6)

$$\begin{aligned} a^3 + b^3 + c^3 + 3abc &= 5a - b - c \\ \Rightarrow 3abc + 3abc &= 5a - b - c \quad [\text{If } a+b+c=0, \text{ then}] \\ \Rightarrow 6abc &= 5a - b - c \quad a^3 + b^3 + c^3 = 3abc \\ \Rightarrow \frac{5a-b-c}{abc} &= 6 \end{aligned}$$

Explanation:

Q. 89

A hemisphere has 42 cm diameter. Find its curved surface area and the total surface area.

- a) $2772 \text{ cm}^2, 4158 \text{ cm}^2$ ✓
- b) $3772 \text{ cm}^2, 5158 \text{ cm}^2$ ✗
- c) $4770 \text{ cm}^2, 4238 \text{ cm}^2$ ✗
- d) $3072 \text{ cm}^2, 4058 \text{ cm}^2$ ✗

$$14. \text{ Diameter} = 2r = 42 \text{ cm}$$

$$r = 21 \text{ cm}$$

$$\begin{aligned} \text{CSA} &= 2\pi r^2 \\ &= 2 \times \frac{22}{7} \times 21 \times 21 \\ &= 2772 \text{ cm}^2 \end{aligned}$$

$$\boxed{\text{TSA} = \text{CSA} + \pi r^2}$$

Explanation:

$$\begin{aligned} \text{TSA} &= 3\pi r^2 \\ &= 3 \times \frac{22}{7} \times 21 \times 21 \\ &= 4158 \text{ cm}^2 \end{aligned}$$

Note: In this Q, only finding the value of CSA will give you the correct answer, no need to find TSA.

Q. 90

Two trains whose lengths are 750 metres and 450 metres are moving towards each other at the speeds of 162 km/hr and 108 km/hr respectively. If the distance between trains is 300 metres, then in how much time, will these trains cross each other?

- a) 25 seconds
- b) 20 seconds
- c) 100 seconds
- d) 75 seconds

Explanation:

15. Trains are moving towards each other,

$$\text{Relative speed} = (162 + 108) \text{ km/hr}$$

$$= 270 \text{ km/hr}$$

$$\downarrow$$

$$\text{in m/s} = 270 \times \frac{5}{18} \text{ m/s}$$

$$= 75 \text{ m/s}$$

$$\text{Distance between trains} = 750\text{m} + 450\text{m}$$

$$+ 300\text{m}$$

$$= 1500\text{m}$$

$$\text{speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\Rightarrow \text{Time} = \frac{D}{S} = \frac{1500}{75} = 20 \text{ sec}$$

Q. 91

If $4x^2 - 6x + 1 = 0$, find $8x^3 + \frac{1}{8x^3} = ?$

- a) 36 X
- b) 18 ✓
- c) 27 X
- d) -27 X

$$16. \quad 4x^2 - 6x + 1 = 0$$

Dividing by $2x$

$$\frac{4x^2}{2x} - \frac{6x}{2x} + \frac{1}{2x} = 0$$

$$\Rightarrow 2x + \frac{1}{2x} = 3 \quad \text{--- (1)}$$

cubing both sides

Explanation:

$$\left(2x + \frac{1}{2x}\right)^3 = (3)^3 \quad [\because (a+b)^3 = a^3 + b^3 + 3ab(a+b)]$$

$$\Rightarrow 8x^3 + \frac{1}{8x^3} + 3 \cdot 2x \cdot \frac{1}{2} \cdot (2x + \frac{1}{2x}) = 27$$

$$\Rightarrow 8x^3 + \frac{1}{8x^3} + 3(3) = 27$$

$$\Rightarrow 8x^3 + \frac{1}{8x^3} = 27 - 9$$

$$\Rightarrow 8x^3 + \frac{1}{8x^3} = 18$$

Q. 92

A work was finished by L, P and Q together. L and P together finished 70 percent part of the work. P and Q together finished 50 percent part of the work. Who among the three is most efficient?

- a) L ✓
- b) P X
- c) Q X
- d) Can't be answer X

$$17. \quad L+P = 70\% \quad \text{--- (1)}$$

$$P+Q = 50\% \quad \text{--- (2)}$$

Adding eqⁿ ① & ②

$$L+P+Q+P = 70\% + 50\% = 120\%$$

$$\Rightarrow 100\% + P = 120\%$$

$$\Rightarrow P = 20\%$$

From eqⁿ ① & ② we get,

$$L = 50\%, Q = 30\%$$

∴ Therefore 'L' is most efficient

Explanation:

Q. 93 Find three consecutive numbers such that four times the first, three times the second and five times the third together make 169.

- a) 12,13,14 X
- b) 13,14,16 X
- c) 13,14,15 ✓
- d) 14,15,16 X

Explanation: 18. let 3 Consecutive no. be $x-1, x, x+1$
 AlQ, $4(x-1) + 3x + 5(x+1) = 169$
 $\Rightarrow 12x + 1 = 169$
 $\Rightarrow 12x = 168$
 $\Rightarrow x = 14$
 $\therefore 3 \text{ consecutive numbers}$
 $\Rightarrow 13, 14, 15.$

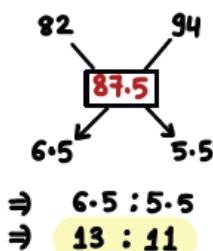
Q. 94 In what ratio, sugar costing ₹82 per kg be mixed with sugar costing 94 per kg such that by selling the mixture at ₹ 77 per kg there is a loss of 12%?

- a) 13:11 ✓
- b) 7:6 X
- c) 11:13 X
- d) 6:7 X

19. let CP = $100x$
 loss of 12%. $\Rightarrow SP = 100x - 12\%$.
 $= 100x - \frac{12}{100} \times 100x$
 $= 100x - 12x$
 $= 88x$

$SP = ₹77$
 $\Rightarrow 88x = ₹77$
 $\Rightarrow 100x = \frac{77}{88} \times 100$
 $= \frac{77}{8} \times 100$
 $= ₹87.5 \text{ (CP)}$

Now,



$$\Rightarrow 6.5 : 5.5$$

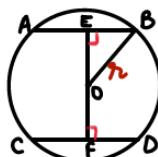
$$\Rightarrow 13 : 11$$

Q. 95

In a circle with centre O and radius 13 cm, two parallel chords are drawn on different sides of the centre. If the length of one chord is 10 cm and the distance between the two chords is 17 cm, find the difference in lengths of the two chords (in cm).

- a) 10 X
- b) 12 X
- c) 14 ✓
- d) 24 X

20.



AB and CD \Rightarrow two parallel chords

$$EF = 17 \text{ cm}$$

$$\text{let } AB = 10 \text{ cm}$$

$$\text{let } OE = 'x'$$

$$\therefore FO = EF - OE \\ = (17 - x)$$

In $\triangle BOE$,

$$BO^2 = OE^2 + BE^2$$

$$\Rightarrow x^2 = r^2 + \left(\frac{10}{2}\right)^2$$

$$\therefore BE = AE = 5 \text{ cm}$$

$$\Rightarrow r^2 = x^2 + 5^2$$

$$\Rightarrow x^2 = r^2 - 5^2$$

$$\Rightarrow x^2 = 13^2 - 5^2$$

$$\Rightarrow x^2 = (13-5)(13+5)$$

$$\Rightarrow x = \sqrt{18 \times 8}$$

$$= 12 \text{ cm}$$

[The line segment drawn from the center of circle \perp to a chord bisects that chord]

Explanation:

In $\triangle FOD$,

$$(OD)^2 = FO^2 + FD^2$$

$$\Rightarrow r^2 = (17-x)^2 + FD^2$$

$$\Rightarrow (13)^2 = (17-x)^2 + FD^2$$

$$\Rightarrow FD^2 = 13^2 - 5^2$$

$$\Rightarrow FD^2 = 144$$

$$\Rightarrow FD = 12$$

$$\therefore CD = 2FD$$

$$= 2 \times 12 \text{ cm}$$

$$= 24 \text{ cm}$$

Difference between length of chords $= 24 \text{ cm} - 10 \text{ cm} = 14 \text{ cm}$

Q. 96

A certain sum on simple interest becomes Rs. 9000 in 3 years and Rs. 10000 in 5 years. If the rate of interest had been 2% more, then in how many years would the sum have doubled?

- a) 12.56 years X
- b) 10.5 years X
- c) 11.54 years ✓
- d) 12 years X

21. A certain sum on SI becomes 9000 in 3 years and 10,000 in 5 years

$$\begin{aligned} \Rightarrow 10000 - 9000 &= \frac{P \cdot R \cdot (5-3)}{100} \\ \Rightarrow 1000 &= \frac{P \cdot R \cdot 2}{100} \\ \Rightarrow P \cdot R &= 50,000 \quad (1) \\ S.I + P &= 9000 \\ S.I &= 9000 - P \\ \Rightarrow 9000 - P &= \frac{P \cdot R \cdot (3)}{100} = \frac{50000 \cdot 3}{100} \\ \Rightarrow P &= 7500 \quad (2) \end{aligned}$$

If the sum is doubled, Amount = 2P

$$\begin{aligned} \Rightarrow S.I + P &= 2P \\ \Rightarrow S.I &= P \\ \Rightarrow P &= \frac{P \cdot (R+2) \cdot T}{100} \\ \Rightarrow T &= \frac{100}{\frac{50,000}{P} + 2} \\ T &= \frac{100}{\frac{50000}{7500} + 2} \\ T &= \frac{100}{\frac{20}{3} + 2} = \frac{300}{26} \\ \therefore T &= 11.54 \text{ years} \end{aligned}$$

Explanation:

Q. 97

The ratio of the incomes of A and B last year was 3:5, respectively. The ratios of their individual incomes of the last year and the present year are 7:11 and 10:11 respectively. If their total income for the present year is Rs. 8.58 lakh, the income of B last year was:

- a) 2.52 lakh X
- b) 3.96 lakh X
- c) 4.62 lakh X
- d) 4.20 lakh ✓

	A	B
last yr.	$3x = 7a$	$5x = 10y$
current yr.	$11a$	$11y$

$$\begin{aligned}
 11a + 11y &= 8.58 \text{ lakh} \\
 \Rightarrow a + y &= 0.78 \text{ lakh} \\
 \Rightarrow \frac{3x}{7} + \frac{5x}{10} &= 0.78 \text{ lakh} \\
 \Rightarrow x &= 0.84 \text{ lakh}
 \end{aligned}$$

$$\begin{aligned}
 \text{Income of 'B' last year} &= 5x \\
 &= 5 \times 0.84 \\
 &= 4.20 \text{ lakh}
 \end{aligned}$$

Explanation:

Q. 98

The expression $\sqrt{10 + 2(\sqrt{6} - \sqrt{15} - \sqrt{10})}$ is equal to:

- a) $\sqrt{3} + \sqrt{2} - \sqrt{5}$ ✓
- b) $\sqrt{3} - \sqrt{2} - \sqrt{5}$ X
- c) $\sqrt{3} - \sqrt{2} + \sqrt{5}$ X
- d) $\sqrt{2} - \sqrt{3} - \sqrt{5}$ X

$$\begin{aligned}
 23. \quad \sqrt{10+2(\sqrt{6}-\sqrt{15}-\sqrt{10})} &= (a+b+c) \text{ let} \\
 \text{Squaring both sides,} \quad &\text{Note: Since there are 3 terms} \\
 10+2(\sqrt{6}-\sqrt{15}-\sqrt{10}) &= (a+b+c)^2 \\
 \Rightarrow 10+2(\sqrt{6}-\sqrt{15}-\sqrt{10}) &= a^2+b^2+c^2+2(ab+bc+ca) \\
 \text{on comparision,} \quad &
 \end{aligned}$$

$$\begin{aligned}
 a^2+b^2+c^2 &= 10 \quad 2(ab+bc+ac) = 2(\sqrt{6}-\sqrt{15}-\sqrt{10}) \\
 \Rightarrow ab+bc+ac &= \sqrt{6}-\sqrt{15}-\sqrt{10} \\
 ab &= \sqrt{6} = \sqrt{2} \cdot \sqrt{3} \\
 bc &= -\sqrt{15} = \sqrt{3}(-\sqrt{5}) \\
 ac &= -\sqrt{10} = \sqrt{2}(-\sqrt{5}) \\
 a &= \sqrt{2}, b = \sqrt{3}, c = -\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 \therefore \sqrt{10+2(\sqrt{6}-\sqrt{15}-\sqrt{10})} &= a+b+c \\
 &= (\sqrt{2}+\sqrt{3}-\sqrt{5})
 \end{aligned}$$

Explanation:

Q. 99

If $\left[4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}} \right]^{\text{th}}$ part of a journey takes 10 minutes, then to complete $\frac{3}{5}$ th of that journey, it will take-

- a) 48 minutes ✓
- b) 40 minutes ✗
- c) 45 minutes ✗
- d) 36 minutes ✗

$$\begin{aligned}
 24. \quad & \left(\frac{4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}}{\frac{4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{9/4}}}}{9/4}} \right)^{\text{th}} = \left(\frac{4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{9/4}}}}{\frac{4 - \frac{5}{1 + \frac{1}{3 + \frac{4}{9}}}}{3 + \frac{4}{9}}} \right)^{\text{th}} \\
 & = \left(\frac{4 - \frac{5}{1 + \frac{1}{8/9}}}{\frac{4 - \frac{5}{1 + \frac{9}{31}}}{8/9}} \right)^{\text{th}} = \left(\frac{4 - \frac{5}{40/31}}{\frac{4 - \frac{5}{40}}{8/9}} \right)^{\text{th}} \\
 & = \left(\frac{4 - \frac{31 \times 5}{40}}{\frac{160 - 155}{40}} \right)^{\text{th}} = \frac{5}{40}^{\text{th}}
 \end{aligned}$$

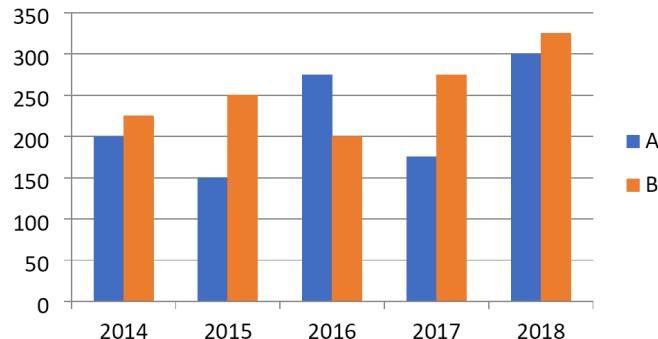
Explanation:

A/Q, $(\frac{5}{40})^{\text{th}}$ part of Journey is completed in 10 mins.

$$\begin{aligned}
 (\frac{5}{40})^{\text{th}} &\rightarrow 10 \text{ mins} \\
 (\frac{3}{5})^{\text{th}} &\rightarrow \frac{10}{5/40} \times \frac{3}{5} \\
 &= \frac{10}{5} \times \frac{40}{5} \times \frac{3}{5} \\
 &= 48 \text{ mins}
 \end{aligned}$$

Q. 100

The following bar graph shows exports of cars of types A and B (in millions) from 2014 to 2018.



(X axis=years, Y axis=export(in million))

What is the ratio of the total exports of cars of type A in 2014 and 2017 to the total exports of cars of type B in 2015 and 2016?

- a) 10:9 X
- b) 5:6 ✓
- c) 11:10 X
- d) 3:2 X

Explanation:

$$\begin{aligned}
 25. \frac{\text{Type A in 2014 \& 2017}}{\text{Type B in 2015 \& 2016}} &= \frac{200+175}{250+200} \\
 &= \frac{375}{450} = \frac{15}{18} = \frac{5}{6}
 \end{aligned}$$