Directions of Test

Test Name	2016 Bull CAT 12	Total Questions	100	Total Time	180 Mins

Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking
Verbal Ability	34	1:0(h:m)	3	1/3
DI & Reasoning	32	1:0(h:m)	3	1/3
Quantitative Ability	34	1:0(h:m)	3	1/3

Section : Verbal Ability

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 1

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The Arrow: Imagine an arrow shot from a bow. During a certain span of time it moves from A to B. But at any instant, where is the arrow? Answer: in any instant, the arrow occupies a space exactly equal to its length. Now an instant of time is a bit like a geometer's point. A point, in geometry, has no spatial magnitude: it has no length or breadth. Similarly, an instant has no temporal length.. It isn't merely a very short period, a fraction of a nanosecond; it takes up no time whatsoever. But motion takes time, necessarily. So how does the arrow ever move? At every instant it is at rest; so it is always at rest.

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The general objective of the author of the passage is:

A) To inform us about the existence of certain paradoxes and how these are important.
B) To illustrate the faulty logic used to explicate certain paradoxes and how these dictate reasoning.
C) To highlight the historical importance of certain paradoxes and their role in reasoning
✓D) To point out the utility of certain paradoxes that may not necessarily be flawless in themselves

Explanation:-
Option D
In the given case, the author of the passage highlights certain paradoxes given by Zeno, explains what they are, then points out the logical issues concerning them and at last, explains how these have a role in modern reasoning and what kind of role they play. Keeping this in mind, we can see that option 4 is the best fit in the given case. It implies that even though the paradoxes may not be flawless in themselves (that is, there is a chance they may not be correct) but they do have some utility (as explained by the last paragraph of the passage).

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In the paradox 'Achilles and the Tortoise', if Achilles give the tortoise a head start and tires to catch him, then according to Zeno, then:

I .Achilles is acting with unwanted optimism.

II. Achilles is living in a fool's paradise.
III. Achilles is trying something unfeasible.

How many of the above statements are true?

✓A) 1 B) 2 C) 3 D) 0

Explanation:-
Option A
In the given case, only one statement is correct, that is statement III. The paradox clearly illustrates that Achilles is attempting something that cannot be achieved.
Statement I states that he is acting with unwanted optimism. There is no mention of optimism in the paradox.
Statement II states that he is living in a fool's paradise. Fool's paradise means 'a state of happiness based on a person's not knowing about or denying the existence of potential trouble.' This is clearly not applicable in the given context of the passage.

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In the paradox 'the arrow', according to Zeno, the arrow is essentially:

A) Permanently in transition B) Temporarily in transition C) Perceptually at rest ✓D) Deceivingly at rest

Explanation:-

Option D

The answer to this question can be found from the lines: At every instant it is at rest; so it is always at rest. This clearly points out that the arrow is at rest only (even though it appears to be in motion). Options 1 and 2 are incorrect as the arrow is not in transition. Option 3 is incorrect as perceptually, the arrow is actually moving.

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Question No. : 4

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How many of the following words can be used to describe Parmenides' conception of reality

I. Static
II. Inseparable
III. Eternal
IV. Immutable
V. Immortal

A) 2 B) 3 C) 4 ✓D) 5

Explanation:-

Option D
Refer to the lines: Zeno was a student of Parmenides, and the purpose of his paradoxes is to defend Parmenides' conception of ultimate reality as an unchanging, indivisible, imperishable unity.
The individual words can be derived from the above lines:
Static and immutable can be derived from unchanging.
Inseparable can be derived from indivisible.
Eternal and immortal can be derived from imperishable

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

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Which of the following inferences can be drawn about the phrase 'reductio ad absurdum'?

A) it is form of reasoning which arrives at a proof by showing that the consequences of the proposition are logical
✓B) it is form of reasoning which arrives at a disproof by showing that the consequences of the proposition are absurd
C) it is form of reasoning which arrives at a disproof by showing that the consequences of the proposition are logical
D) it is form of reasoning which arrives at a proof by showing that the consequences of the proposition are reasonable

Explanation:- *The keyword in this case is 'absurd'. We need an answer option which shows that the given conclusion has been arrived by showcasing something as absurd. This is done by option 2.*

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The approach of the author towards Zeno of Elea can be labelled as:

A) Lackadaisical B) Reverential C) Deprecatory ✓D) Interpretative

Explanation:- *Let us have a look at the meanings of the individual words:*
1. Lackadaisical: Lacking spirit or liveliness
2. Reverential: Feeling or manifesting veneration
3. Deprecatory: Tending to diminish or disparage
4. Interpretative: relating to or providing an interpretation.
We can clearly see that option 4 is the best answer in the given case.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 7

Many politicians are quick to cite a statistic that, on average, women earn 77 cents for every dollar that a man earns. This figure is usually used as part of a call to action for "equal pay for equal work," but the 77-cents number on its own says surprisingly little about whether women are discriminated against with regard to earnings in the workplace.

There are two important factors that this comparison doesn't take into account. First, the number doesn't account for the fact that different occupations have widely differing levels of compensation, and men and women tend to sort into different occupations. Second, the number doesn't account for the number of hours worked in salaried positions- in other words, if salaried men work more hours than salaried women, then it would not be discriminatory to pay salaried men more than salaried women. As a result, some influential people assert that the earnings difference is mainly attributable to occupational choices. This explanation, however, is also very incomplete, especially for younger cohorts of workers. (For example, young unmarried women earn almost as much on average as men of equivalent age.) What the data shows instead is that, while today's men and women tend to start in the same place with regard to earnings, the gap widens as workers get older.

Why does this happen? Economist Claudia Goldin, who has looked extensively at data on earnings and workplace characteristics, asserts that women get penalized in the workplace, even on a per-hour basis, for working fewer hours. For example, many occupations are such that a worker who works 80 hours per week gets paid more than twice as much as a worker who works 40 hours a week. Given that women are disproportionately responsible for child-care and home duties, they tend to work fewer hours outside the home than men do, meaning in many cases that they not only earn less because they work less but also because there tends to be a per hour "working less" penalty. In addition, many occupations impose a stiff earnings penalty for any time spent out of the workforce. Again, women are more likely to take time off from work, and this plus the working less penalty explain a lot of the observed gender earnings gap (or at least the "unfair" part that can't be explained directly by women working less). Therefore, effective public policy to fairly address the gender earnings gap would focus on how to make workplaces more flexible so that time out of a job doesn't have a big effect on productivity and workers working fewer hours per week or working nontraditional hours can be just as productive (per hour) as workers who are always "on call."

Goldin cites recent logistical developments in the pharmacy profession as well as the field of obstetrics that have enabled women to achieve earnings parity with men. In obstetrics, once patients started accepting that anyone from a team of qualified doctors could deliver a baby under most circumstances, having their particular obstetrician on call and available at all times was not absolutely crucial. Similarly, technology and electronic record-keeping have made pharmacists more substitutable for one other, giving any one pharmacist a more flexible schedule and work environment. Granted, the changes described have come about without any sort of government intervention, but whether other occupations will follow suit depends on whether the decision makers in those occupations have the proper incentives to make institutional changes.

According to the passage, which of the following can help reduce the 'gender earnings gap'?

I. Women start to work longer hours and compete with men on equal footing.
II. Women are given the option of working at times other than the conventional office hours.
III. Women start to work in traditionally male-dominated occupations.

A) I & II ✓B) II & III C) I & III D) All of the above

Explanation:-
Option B
Statement I : In this case, the author of the passage does not recommend that women should work longer hours and compete with men.
Statement II :the passage recommends that they should work on non-traditional hours.
Statement III: This is given in the second paragraph of the passage, 'First, the number doesn't control for the fact that different occupations have widely differing levels of compensation, and men and women tend to sort into different occupations.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 8

Many politicians are quick to cite a statistic that, on average, women earn 77 cents for every dollar that a man earns. This figure is usually used as part of a call to action for "equal pay for equal work," but the 77-cents number on its own says surprisingly little about whether women are discriminated against with regard to earnings in the workplace.

There are two important factors that this comparison doesn't take into account. First, the number doesn't account for the fact that different occupations have widely differing levels of compensation, and men and women tend to sort into different occupations. Second, the number doesn't account for the number of hours worked in salaried positions- in other words, if salaried men work more hours than salaried women, then it would not be discriminatory to pay salaried men more than salaried women. As a result, some influential people assert that the earnings difference is mainly attributable to occupational choices. This explanation, however, is also very incomplete, especially for younger cohorts of workers. (For example, young unmarried women earn almost as much on average as men of equivalent age.) What the data shows instead is that, while today's men and women tend to start in the same place with regard to earnings, the gap widens as workers get older.

Why does this happen? Economist Claudia Goldin, who has looked extensively at data on earnings and workplace characteristics, asserts that women get penalized in the workplace, even on a per-hour basis, for working fewer hours. For example, many occupations are such that a worker who works 80 hours per week gets paid more than twice as much as a worker who works 40 hours a week. Given that women are disproportionately responsible for child-care and home duties, they tend to work fewer hours outside the home than men do, meaning in many cases that they not only earn less because they work less but also because there tends to be a per hour "working less" penalty. In addition, many occupations impose a stiff earnings penalty for any time spent out of the workforce. Again, women are more likely to take time off from work, and this plus the working less penalty explain a lot of the observed gender earnings gap (or at least the "unfair" part that can't be explained directly by women working less). Therefore, effective public policy to fairly address the gender earnings gap would focus on how to make workplaces more flexible so that time out of a job doesn't have a big effect on productivity and workers working fewer hours per week or working nontraditional hours can be just as productive (per hour) as workers who are always "on call."

Goldin cites recent logistical developments in the pharmacy profession as well as the field of obstetrics that have enabled women to achieve earnings parity with men. In obstetrics, once patients started accepting that anyone from a team of qualified doctors could deliver a baby under most circumstances, having their particular obstetrician on call and available at all times was not absolutely crucial. Similarly, technology and electronic record-keeping have made pharmacists more substitutable for one other, giving any one pharmacist a more flexible schedule and work environment. Granted, the changes described have come about without any sort of government intervention, but whether other occupations will follow suit depends on whether the decision makers in those occupations have the proper incentives to make institutional changes.

Each of the following could be an apt title for the passage except:

A) The Economics of the Gender Earnings Gap B) The Statistics of the Gender Earnings Gap
C) The Sociology that operates behind the Gender Earnings Gap ✓D) The Business of the Gender Earnings Gap

Explanation:-
Option D
Remember we need to pick an option that does not fit here. Which is that option here? In this case, option 4 is the one as there is no talk of the gender earnings gap from a business perspective. The passage highlights the statistics, economic impact and the impact on society in general. This makes option 4 the apt answer in this case.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 9

Many politicians are quick to cite a statistic that, on average, women earn 77 cents for every dollar that a man earns. This figure is usually used as part of a call to action for "equal pay for equal work," but the 77-cents number on its own says surprisingly little about whether women are discriminated against with regard to earnings in the workplace.

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The relationship between the 2nd and the 3rd paragraph of the passage can be outlined as:

A) The former presents an argument and the latter represents a refutation of the same argument.
B) The former presents a line of reasoning and the latter provides a substantiation for the same argument.
✓C) The former provides a partial explanation for an occurrence and the latter provides a substantive completion for the same.
D) The former focuses on some elements that constitute an occurrence and the latter provides an insight into remaining bits for the same occurrence.

Explanation:-
Option C
In the given case, paragraph 2 provides two reasons for the gender earnings gap (quotes as an occurrence in the passage.) Paragraph 3 provides a completion for the incomplete analysis in paragraph 2. This makes option 3 the apt choice in this case.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 10

Many politicians are quick to cite a statistic that, on average, women earn 77 cents for every dollar that a man earns. This figure is usually used as part of a call to action for "equal pay for equal work," but the 77-cents number on its own says surprisingly little about whether women are discriminated against with regard to earnings in the workplace.

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It can be inferred from the passage that:

A) In the coming time, other professions may follow the trend set up by obstetrics and pharmacy in enabling flexible working hours.
B) In the future, there is no guarantee that other professions will follow the same approach followed by obstetrics and

pharmacy in enabling flexible working hours.
C) If government had wished to intervene, then professions other than obstetrics and pharmacy could have enabled flexible working hours sooner.
✓D) If government intervention is there, then changes that help develop flexible work environments can be brought about.

Explanation:-
Option D
*The answer to this question can be inferred from the lines: Granted, the changes described have come about without **any sort of government intervention**, but whether other occupations will follow suit depends on whether the decision makers in those occupations **have the proper incentives** to make institutional changes.*
These portions in bold of the above extract from the passage highlights how having government interventions and incentives can have a positive impact on work environments.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 11

Many politicians are quick to cite a statistic that, on average, women earn 77 cents for every dollar that a man earns. This figure is usually used as part of a call to action for "equal pay for equal work," but the 77-cents number on its own says surprisingly little about whether women are discriminated against with regard to earnings in the workplace.

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The tone of the author of the passage can be labelled as:

A) Perplexed ✓B) Analytical C) Unprejudiced D) Factual

Explanation:- *Let us have a look at the meanings of the answer options:*

1. Perplexed: Full of difficulty, confusion or bewilderment
2. Analytical: Relating to or using analysis or logical reasoning
3. Unprejudiced: Free from undue bias or preconceived opinions
4. Factual: Of or relating to or characterized by facts

Now this question has some close answer options and careful analysis is required on your part. Remember, there are some options

which might not contradict the passage (options 3 and 4) but this does not mean they are the correct answer. The author is analyzing a topic and mentioning the logic behind the current situation. He is not limited to being factual or unprejudiced.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 12

Many politicians are quick to cite a statistic that, on average, women earn 77 cents for every dollar that a man earns. This figure is usually used as part of a call to action for "equal pay for equal work," but the 77-cents number on its own says surprisingly little about whether women are discriminated against with regard to earnings in the workplace.

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Which of the following is incorrect as per the passage?

I. In current times, young unmarried women earn almost the same as their male counterparts.
II. Income disparity between men and women goes down as we move up the age spectrum for working professionals.
III. The difference between the earning of men and women is caused mainly by occupational choices of two genders.

A) I & II ✓B) II & III C) I & III D) All of the above

Explanation:-
Statement I can be derived from the lines: This explanation, however, is also very incomplete, especially for younger cohorts of workers. (For example, young unmarried women earn almost as much on average as men of equivalent age.) What the data shows instead is that, while today's men and women tend to start in the same place with regard to earnings, the gap widens as workers get older.

With age, the earning diversity increase and not decreases. Statement II is against the central idea of the passage.
The author clearly rejects statement III: As a result, some influential people assert that the earnings difference is mainly attributable to occupational choices. This explanation, however, is also very incomplete, especially for younger cohorts of workers. (For example, young unmarried women earn almost as much on average as men of equivalent age.) What the data shows instead is that, while today's men and women tend to start in the same place with regard to earnings, the gap widens as workers get older.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 13

Let us consider for a moment the discovery of the cause of malaria. This discovery, due to the Englishman, Ross consists in having found out that the plasmodium of malaria is inoculated in man by a special kind of mosquito. Let us inquire what was the state of science prior to this discovery. In 1880 Laveran had described an animal micro-organism, which preyed upon the red corpuscles of the blood, producing an attack of fever with the cycle of its existence. Subsequent studies confirmed and elucidated this fact, and the *plasmodium malariae* became a matter of common knowledge. It was known that animal micro-organisms, unlike vegetable micro-organisms, after a cycle of life in which reproduction takes place by scission;that is, by subdivision of a single body into several other bodies equal to the first, give place to *sexual forms*, masculine and feminine, which are separate, and incapable of scission, but are designed for *fusion into one another*, after which the organism recommences its cycle of scissions until it again reaches the sexual forms.

Laveran had found that in the blood of sufferers who recover spontaneously from malarial fever there are a great number of corpuscles which have no longer the rounded forms of the plasmodia, but are crescent-shaped and rayed. He took these to be transformations of the plasmodia, "modified in form" and "incapable of producing disease," and pronounced them to be "degenerate" organisms, almost as if they had been deformed and exhausted by the "excess of work" they had previously performed. After the discovery of the transmission of malaria in 1900, Laveran's "degenerative forms" were recognized as the sexual individuals of the reproductive cycle: individuals which were incapable of conjugation in the blood of man, and could only produce new organisms in the body of the mosquito. We may well wonder: Why did not Laveran simply recognize those sexual forms, and why did he not seek for the period of conjugation in the plasmodia, which were animal micro-organisms?

Another biological acquisition was the assurance that the circulatory system of the blood is a closed system of vessels, and that the enclosing epithelium is not permeable by non-incisive solid bodies such as vegetable microbes, and still less by rounded protozoa, which are much larger than microbes and soft in substance. This well-known and clearly demonstrated fact ought to have suggested a problem to the minds of students: How do the protozoa of malaria enter the circulatory current of the blood? But ever since the days of Hippocrates, Pliny, Celsius and Galen it had been held that this fever was caused by the "poisonous atmosphere" of marsh lands, the bad air of the morning and the evening, so much so that even a few years before the discovery of the real cause of malaria, eucalyptus trees were planted in the belief that they would filter and disinfect the air.

Until Ross discovered that birds are inoculated with malaria by a particular kind of mosquito.

Excerpted from Pg 103-104 'Spontaneous Activity in Education' by Maria Montessori

Why did Laveran call the sexual form of the *plasmodium malariae* a 'degenerative' form?

✓A) Laveran believed that this form had lost the potency to produce disease.
B) Because of the change of shape from a regular round one to a crescent shaped rayed one.
C) Reason was the incapability of conjugation of these forms in human blood.
D) Laveran's believed that the organism entering the blood stream form the 'poisonous atmosphere' of marsh lands.

Explanation:-
Option A
The dictionary meaning of the word degenerate: having lost the physical, mental, or moral qualities considered normal and desirable; showing evidence of decline.
Laveran found this shape change in patients who had spontaneously recovered – so he felt that the reduction in potency of this form was the reason for the recovery – hence he called it degenerate.

2 – The change in shape does not connect to potency
3 – This information was not available to Laveran.
4 – Even if this statement is correct, it does not relate to degeneracy.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 14

Let us consider for a moment the discovery of the cause of malaria. This discovery, due to the Englishman, Ross consists in having found out that the plasmodium of malaria is inoculated in man by a special kind of mosquito. Let us inquire what was the state of science prior to this discovery. In 1880 Laveran had described an animal micro-organism, which preyed upon the red corpuscles of the blood, producing an attack of fever with the cycle of its existence. Subsequent studies confirmed and elucidated this fact, and the *plasmodium malariae* became a matter of common knowledge. It was known that animal micro-organisms, unlike vegetable micro-organisms, after a cycle of life in which reproduction takes place by scission;that is, by subdivision of a single body into several other bodies equal to the first, give place to *sexual forms*, masculine and feminine, which are separate, and incapable of scission, but are designed for *fusion into one another*, after which the organism recommences its cycle of scissions until it again reaches the sexual forms.

Laveran had found that in the blood of sufferers who recover spontaneously from malarial fever there are a great number of corpuscles which have no longer the rounded forms of the plasmodia, but are crescent-shaped and rayed. He took these to be transformations of the plasmodia, "modified in form" and "incapable of producing disease," and pronounced them to be "degenerate" organisms, almost as if they had been deformed and exhausted by the "excess of work" they had previously performed. After the discovery of the transmission of malaria in 1900, Laveran's "degenerative forms" were recognized as the sexual individuals of the reproductive cycle: individuals which were incapable of conjugation in the blood of man, and could only produce new organisms in the body of the mosquito. We may well wonder: Why did not Laveran simply recognize those sexual forms, and why did he not seek for the period of conjugation in the plasmodia, which were animal micro-organisms?

Another biological acquisition was the assurance that the circulatory system of the blood is a closed system of vessels, and that the enclosing epithelium is not permeable by non-incisive solid bodies such as vegetable microbes, and still less by rounded protozoa, which are much larger than microbes and soft in substance. This well-known and clearly demonstrated fact ought to have suggested a problem to the minds of students: How do the protozoa of malaria enter the circulatory current of the blood? But ever since the days of Hippocrates, Pliny, Celsius and Galen it had been held that this fever was caused by the "poisonous atmosphere" of marsh lands, the bad air of the morning and the evening, so much so that even a few years before the discovery of the real cause of malaria, eucalyptus trees were planted in the belief that they would filter and disinfect the air.

Until Ross discovered that birds are inoculated with malaria by a particular kind of mosquito.

Excerpted from Pg 103-104 'Spontaneous Activity in Education' by Maria Montessori

What is the main lesson that this passage strives to give to its reader?

A) Science's role in the containment of disease can never be underestimated.
B) The best way to discover truth is by building on previous discoveries
✓C) Progress can only be achieved when we start questioning our handed-down beliefs.
D) If only mosquito nets had been put to use earlier, a lot of deaths could have been prevented.

Explanation:-
Option C
The main message over here is how for hundreds of years we could not make any progress in reducing deaths by malaria, because of our mistaken notions about how the disease spread. Only when people like Ross used common sense and already existing knowledge, that he could hypothesise the mosquito as a vector for the spread of the disease. If he had continued to work with the belief that it was an air borne disease, we would still be nowhere. By questioning that belief, progress was made.

1 – The question over here is what makes for science, not science per se
2 – Though the statement is true, but the point over here is contradictory – we need to use past knowledge, but also at times question it.
4 – Again the stateament is correct, but it is not in sync with the message.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 15

Let us consider for a moment the discovery of the cause of malaria. This discovery, due to the Englishman, Ross consists in having found out that the plasmodium of malaria is inoculated in man by a special kind of mosquito. Let us inquire what was the state of science prior to this discovery. In 1880 Laveran had described an animal micro-organism, which preyed upon the red corpuscles of the blood, producing an attack of fever with the cycle of its existence. Subsequent studies confirmed and elucidated this fact, and the *plasmodium malariae* became a matter of common knowledge. It was known that animal micro-organisms, unlike vegetable micro-organisms, after a cycle of life in which reproduction takes place by scission;that is, by subdivision of a single body into several other bodies equal to the first, give place to *sexual forms*, masculine and feminine, which are separate, and incapable of scission, but are designed for *fusion into one another*, after which the organism recommences its cycle of scissions until it again reaches the sexual forms.

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Until Ross discovered that birds are inoculated with malaria by a particular kind of mosquito.

Excerpted from Pg 103-104 'Spontaneous Activity in Education' by Maria Montessori

Which of the following, if true, would give some credence to the hypothesis of 'bad air' of mornings and evenings, as discussed in the last paragraph?

A) Human activity is at its peak in mornings and evenings.
✓B) The specific mosquitoes which are vectors for malaria are most active in twilight periods.
C) Plants produce Carbon Dioxide at night – and mosquitoes use carbon dioxide to detect the presence of humans.
D) Marshes are known to give out methane, inhaling which can lead to pneumonia.

Explanation:-
Option B
If the mosquitoes are most active in twilight hours – read mornings and evenings, then staying indoors in those hours can be seen as a reasonable prevention strategy.

1 – human activity peaking can lead to more Carbon dioxide emissions, but not the bad air in a malaria context.
3 – This goes against the argument, if there is more of Carbon dioxide around, then mosquitoes could get confused – and not bite.
4 – no connection to morning and evening air, though it lamely tries to build on 'bad air'.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 16

Let us consider for a moment the discovery of the cause of malaria. This discovery, due to the Englishman, Ross consists in having found out that the plasmodium of malaria is inoculated in man by a special kind of mosquito. Let us inquire what was the state of science prior to this discovery. In 1880 Laveran had described an animal micro-organism, which preyed upon the red corpuscles of the blood, producing an attack of fever with the cycle of its existence. Subsequent studies confirmed and elucidated this fact, and the *plasmodium malariae* became a matter of common knowledge. It was known that animal micro-organisms, unlike vegetable micro-organisms, after a cycle of life in which reproduction takes place by scission;that is, by subdivision of a single body into several other bodies equal to the first, give place to *sexual forms*, masculine and feminine, which are separate, and incapable of scission, but are designed for *fusion into one another*, after which the organism recommences its cycle of scissions until it again reaches the sexual forms.

Laveran had found that in the blood of sufferers who recover spontaneously from malarial fever there are a great number of corpuscles which have no longer the rounded forms of the plasmodia, but are crescent-shaped and rayed. He took these to be transformations of the plasmodia, "modified in form" and "incapable of producing disease," and pronounced them to be "degenerate" organisms, almost as if they had been deformed and exhausted by the "excess of work" they had previously performed. After the discovery of the transmission of malaria in 1900, Laveran's "degenerative forms" were recognized as the sexual individuals of the reproductive cycle: individuals which were incapable of conjugation in the blood of man, and could only produce new organisms in the body of the mosquito. We may well wonder: Why did not Laveran simply recognize those sexual forms, and why did he not seek for the period of conjugation in the plasmodia, which were animal micro-organisms?

Another biological acquisition was the assurance that the circulatory system of the blood is a closed system of vessels, and that the enclosing epithelium is not permeable by non-incisive solid bodies such as vegetable microbes, and still less by rounded protozoa, which are much larger than microbes and soft in substance. This well-known and clearly demonstrated fact ought to have suggested a problem to the minds of students: How do the protozoa of malaria enter the circulatory current of the blood? But ever since the days of Hippocrates, Pliny, Celsius and Galen it had been held that this fever was caused by the "poisonous atmosphere" of marsh lands, the bad air of the morning and the evening, so much so that even a few years before the discovery of the real cause of malaria, eucalyptus trees were planted in the belief that they would filter and disinfect the air.

Until Ross discovered that birds are inoculated with malaria by a particular kind of mosquito.

Excerpted from Pg 103-104 'Spontaneous Activity in Education' by Maria Montessori

What would be an appropriate title for the passage?

A) Laveran's Loss, Ross' Gain ✓B) The evolution of our understanding of malaria C) The reproductive cycle of *plasmodium malariae* D) The disease of fallacies

Explanation:-
Option B
The main theme over here is about malaria, specifically what our ancestors thought about it – and how we came to our current understanding.

1 – is more about the disease than the people.
3 – is too specific
4 – does not mention malaria

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 17

Lacan said that there was surely something ironic about Christ's injunction to love thy neighbour as thyself – because actually, of course, people hate themselves. Or you could say that, given the way people treat one another, perhaps they had always loved their neighbours in the way they loved themselves: that is, with a good deal of cruelty and disregard. 'After all,' Lacan writes, 'the people who followed Christ were not so brilliant.' Lacan is here implicitly comparing Christ with Freud, many of whose followers in Lacan's view had betrayed Freud's vision by reading him in the wrong way. Lacan could be understood to be saying that, from a Freudian point of view, Christ's story about love was a cover story, a repression of and a self-cure for ambivalence. In Freud's vision we are, above all, ambivalent animals: wherever we hate we love, wherever we love we hate. If someone can satisfy us, they can frustrate us; and if someone can frustrate us we always believe they can satisfy us. And who frustrates us more than ourselves?

Ambivalence does not, in the Freudian story, mean mixed feelings, it means opposing feelings. 'Ambivalence has to be distinguished from having mixed feelings about someone,' Charles Rycroft writes in his appropriately entitled A Critical Dictionary of Psychoanalysis: 'It refers to an underlying emotional attitude in which the contradictory attitudes derive from a common source and are interdependent, whereas mixed feelings may be based on a realistic assessment of the imperfect nature of the object.' Love and hate – a too simple vocabulary, and so never quite the right names – are the common source, the elemental feelings with which we apprehend the world; they are interdependent in the sense that you can't have one without the other, and that they mutually inform each other. The way we hate people depends on the way we love them and vice versa. According to psychoanalysis these contradictory feelings enter into everything we do. We are ambivalent, in Freud's view, about anything and everything that matters to us; indeed, ambivalence is the way we recognise that someone or something has become significant to us. This means that we are ambivalent about ambivalence, about love and hate and sex and pleasure and each other and ourselves, and so on; wherever there is an object of desire there must be ambivalence. But Freud's insistence about our ambivalence, about people as fundamentally ambivalent animals, is also a way of saying that we're never quite as obedient as we seem to be: that where there is devotion there is always protest, where there is trust there is suspicion, where there is self-hatred or guilt there is also self-love. We may not be able to imagine a life in which we don't spend a large amount of our time criticising ourselves and others; but we should keep in mind the self-love that is always in play. Self-criticism can be our most unpleasant – our most sadomasochistic – way of loving ourselves.

Which one of the following fits the bill for the sentiment of irony mentioned in the first paragraph:

A) You love your wife as much as you love someone else's wife B) Your wife loves you as much as she loves someone else ✓C) Your wife loves you much like the way she loves her most hated sister D) Both A and C

Explanation:-
Refer to the lines: Lacan said that there was surely something ironic about Christ's injunction to love thy neighbour as thyself – because actually, of course, people hate themselves.
Irony refers to the incongruity between what might be expected and what actually occurs. So effectively, you need an answer option which represents a set of contradictory feelings. This is found in option 3.
In this case, option 1 might tempt you but it actually incorrect as there is no set of contradictory feelings being exposed in the given case.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 18

Lacan said that there was surely something ironic about Christ's injunction to love thy neighbour as thyself – because actually, of course, people hate themselves. Or you could say that, given the way people treat one another, perhaps they had always loved their neighbours in the way they loved themselves: that is, with a good deal of cruelty and disregard. 'After all,' Lacan writes, 'the people who followed Christ were not so brilliant.' Lacan is here implicitly comparing Christ with Freud, many of whose followers in Lacan's view had betrayed Freud's vision by reading him in the wrong way. Lacan could be understood to be saying that, from a Freudian point of view, Christ's story about love was a cover story, a repression of and a self-cure for ambivalence. In Freud's vision we are, above all, ambivalent animals: wherever we hate we love, wherever we love we hate. If someone can satisfy us, they can frustrate us; and if someone can frustrate us we always believe they can satisfy us. And who frustrates us more than ourselves?

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According to Freud:

A) Ambivalence is indefatigable B) Ambivalence is sadistic and masochistic at the same time
✓C) Ambivalence is all pervasive D) Ambivalence is incurable

Explanation:-
O/ption C
The answer to this question can be found in the lines: According to psychoanalysis these contradictory feelings enter into everything we do.
If we keep the above line in mind, option 3 is the apt option. The meanings of the words in the options are highlighted below:
Indefatigable: Showing sustained enthusiastic action with unflagging vitality
Sadistic: Deriving pleasure or sexual gratification from inflicting pain on another
Masochistic: Deriving pleasure or sexual gratification from being abused or dominated
Pervasive: Spreading or spread throughout
Incurable: Incapable of being cured
Options 1 and 4 are not mentioned in the passage.
Option 2 twists the last line of the passage and is not necessarily a viewpoint of Freud. Also, it does not tell us the quality of ambivalence.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 19

Lacan said that there was surely something ironic about Christ's injunction to love thy neighbour as thyself – because actually, of course, people hate themselves. Or you could say that, given the way people treat one another, perhaps they had always loved their neighbours in the way they loved themselves: that is, with a good deal of cruelty and disregard. 'After all,' Lacan writes, 'the people who followed Christ were not so brilliant.' Lacan is here implicitly comparing Christ with Freud, many of whose followers in Lacan's view had betrayed Freud's vision by reading him in the wrong way. Lacan could be understood to be saying that, from a Freudian point of view, Christ's story about love was a cover story, a repression of and a self-cure for ambivalence. In Freud's vision we are, above all, ambivalent animals: wherever we hate we love, wherever we love we hate. If someone can satisfy us, they can frustrate us; and if someone can frustrate us we always believe they can satisfy us. And who frustrates us more than ourselves?

Ambivalence does not, in the Freudian story, mean mixed feelings, it means opposing feelings. 'Ambivalence has to be distinguished from having mixed feelings about someone,' Charles Rycroft writes in his appropriately entitled A Critical Dictionary of Psychoanalysis: 'It refers to an underlying emotional attitude in which the contradictory attitudes derive from a

common source and are interdependent, whereas mixed feelings may be based on a realistic assessment of the imperfect nature of the object.' Love and hate – a too simple vocabulary, and so never quite the right names – are the common source, the elemental feelings with which we apprehend the world; they are interdependent in the sense that you can't have one without the other, and that they mutually inform each other. The way we hate people depends on the way we love them and vice versa. According to psychoanalysis these contradictory feelings enter into everything we do. We are ambivalent, in Freud's view, about anything and everything that matters to us; indeed, ambivalence is the way we recognise that someone or something has become significant to us. This means that we are ambivalent about ambivalence, about love and hate and sex and pleasure and each other and ourselves, and so on; wherever there is an object of desire there must be ambivalence. But Freud's insistence about our ambivalence, about people as fundamentally ambivalent animals, is also a way of saying that we're never quite as obedient as we seem to be: that where there is devotion there is always protest, where there is trust there is suspicion, where there is self-hatred or guilt there is also self-love. We may not be able to imagine a life in which we don't spend a large amount of our time criticising ourselves and others; but we should keep in mind the self-love that is always in play. Self-criticism can be our most unpleasant – our most sadomasochistic – way of loving ourselves.

From the information given in the passage, it can be inferred that:

A) having mixed feelings consists of having two types of feelings
✓B) having mixed feelings can consist of having two or more types of feelings
C) having mixed feelings consists of having two opposing feelings D) none of the above

Explanation:-
Option B
Refer to the portions highlighted: ***Ambivalence does not, in the Freudian story, mean mixed feelings, it means opposing feelings****. 'Ambivalence has to be distinguished from having mixed feelings about someone,' Charles Rycroft writes in his appropriately entitled A Critical Dictionary of Psychoanalysis: 'It refers to an underlying emotional attitude in which the contradictory attitudes derive from a common source and are interdependent,* ***whereas mixed feelings may be based on a realistic assessment of the imperfect nature of the object.****'*
Having mixed feelings simply means that a person has mix of feelings based on the nature of the object, that is he has two or more feelings. The feelings can be of any type (not necessarily opposite in nature).

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 20

Lacan said that there was surely something ironic about Christ's injunction to love thy neighbour as thyself – because actually, of course, people hate themselves. Or you could say that, given the way people treat one another, perhaps they had always loved their neighbours in the way they loved themselves: that is, with a good deal of cruelty and disregard. 'After all,' Lacan writes, 'the people who followed Christ were not so brilliant.' Lacan is here implicitly comparing Christ with Freud, many of whose followers in Lacan's view had betrayed Freud's vision by reading him in the wrong way. Lacan could be understood to be saying that, from a Freudian point of view, Christ's story about love was a cover story, a repression of and a self-cure for ambivalence. In Freud's vision we are, above all, ambivalent animals: wherever we hate we love, wherever we love we hate. If someone can satisfy us, they can frustrate us; and if someone can frustrate us we always believe they can satisfy us. And who frustrates us more than ourselves?

Ambivalence does not, in the Freudian story, mean mixed feelings, it means opposing feelings. 'Ambivalence has to be distinguished from having mixed feelings about someone,' Charles Rycroft writes in his appropriately entitled A Critical Dictionary of Psychoanalysis: 'It refers to an underlying emotional attitude in which the contradictory attitudes derive from a common source and are interdependent, whereas mixed feelings may be based on a realistic assessment of the imperfect nature of the object.' Love and hate – a too simple vocabulary, and so never quite the right names – are the common source, the elemental feelings with which we apprehend the world; they are interdependent in the sense that you can't have one without the other, and that they mutually inform each other. The way we hate people depends on the way we love them and vice versa. According to psychoanalysis these contradictory feelings enter into everything we do. We are ambivalent, in Freud's view, about anything and everything that matters to us; indeed, ambivalence is the way we recognise that someone or something has become significant to us. This means that we are ambivalent about ambivalence, about love and hate and sex and pleasure and each other and ourselves, and so on; wherever there is an object of desire there must be ambivalence. But Freud's insistence about our ambivalence, about people as fundamentally ambivalent animals, is also a way of saying that we're never quite as obedient as we seem to be: that where there is devotion there is always protest, where there is trust there is suspicion, where there is self-hatred or guilt there is also self-love. We may not be able to imagine a life in which we don't spend a large amount of our time criticising ourselves and others; but we should keep in mind the self-love that is always in play. Self-criticism can be our most unpleasant – our most sadomasochistic – way of loving ourselves.

In the context of the passage, the word 'sadomasochistic' means:

A) A way in which sadness and manliness is combined

B) A way in which sadness and manliness is inflicted as well as combined
✓C) A way in which pain and humiliation is inflicted as well as received
D) A way in which a person derives pleasure by hurting others

Explanation:-
Sadomasochistic refers to the tendency of sadism and masochism combined in one person.
Sadism is defined as: the tendency to derive pleasure, especially sexual gratification, from inflicting pain, suffering, or humiliation on others.
Masochism is defined as: the tendency to derive sexual gratification from one's own pain or humiliation.
Combining the above, we can see that option 3 is the correct answer in the given case.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 21

The attempt to conceive imaginatively a better ordering of human society than the destructive and cruel chaos in which mankind has hitherto existed is by no means modern: it is at least as old as Plato, whose ``Republic'' set the model for the Utopias of subsequent philosophers. Whoever contemplates the world in the light of an ideal—whether what he seeks be intellect, or art, or love, or simple happiness, or all together—must feel a great sorrow in the evils that men needlessly allow to continue, and—if he be a man of force and vital energy—an urgent desire to lead men to the realization of the good which inspires his creative vision. It is this desire which has been the primary force moving the pioneers of Socialism and Anarchism, as it moved the inventors of ideal commonwealths in the past. In this there is nothing new. What is new in Socialism and Anarchism, is that close relation of the ideal to the present sufferings of men, which has enabled powerful political movements to grow out of the hopes of solitary thinkers. It is this that makes Socialism and Anarchism important and it is this that makes them dangerous to those who batten, consciously or unconsciously upon the evils of our present order of society.

The great majority of men and women, in ordinary times, pass through life without ever contemplating or criticising, as a whole, either their own conditions or those of the world at large. They find themselves born into a certain place in society, and they accept what each day brings forth, without any effort of thought beyond what the immediate present requires. Almost as instinctively as the beasts of the field, they seek the satisfaction of the needs of the moment, without much forethought, and without considering that by sufficient effort the whole conditions of their lives could be changed. A certain percentage, guided by personal ambition, make the effort of thought and will which is necessary to place themselves among the more fortunate members of the community; but very few among these are seriously concerned to secure for all the advantages which they seek for themselves. It is only a few rare and exceptional men who have that kind of love toward mankind at large that makes them unable to endure patiently the general mass of evil and suffering, regardless of any relation it may have to their own lives. These few, driven by sympathetic pain, will seek, first in thought and then in action, for some way of escape, some new system of society by which life may become richer, more full of joy and less full of preventable evils than it is at present. But in the past such men have, as a rule, failed to interest the very victims of the injustices which they wished to remedy. The more unfortunate sections of the population have been ignorant, apathetic from excess of toil and weariness, timorous through the imminent danger of immediate punishment by the holders of power, and morally unreliable owing to the loss of self-respect resulting from their degradation. To create among such classes any conscious, deliberate effort after general amelioration might have seemed a hopeless task, and indeed in the past it has generally proved so. But the modern world, by the increase of education and the rise in the standard of comfort among wage-earners, has produced new conditions, more favorable than ever before to the demand for radical reconstruction. It is above all the Socialists, and in a lesser degree the Anarchists, who have become the exponents of this demand.

What is perhaps most remarkable in regard to both Socialism and Anarchism is the association of a widespread popular movement with ideals for a better world. The ideals have been elaborated, in the first instance, by solitary writers of books, and yet powerful sections of the wage-earning classes have accepted them as their guide in the practical affairs of the world. In regard to Socialism this is evident; but in regard to Anarchism it is only true with some qualification.

excerpted from ''proposed road to freedom'' by Bertand Russel

According to the information provided in the passage, men can be classified :

I. as timid followers
II. as altruistic iconoclasts
III. as self-interested savants
IV. as learned self-seekers

A) I, II & III B) II, III & IV C) I, III & IV ✓D) I, II & IV

Explanation:-
In the second paragraph of the passage, the author portrays men in different lights. Let's analyze all the choices given to us:
as timid followers: people happy to follow the current system of functioning
as altruistic iconoclasts: men who are willing to go against conventional systems for the good of others.
as self-interested savants: this is not implied in the passage as nowhere does he refer to selfish individual as savants (Someone who has been admitted to membership in a scholarly field).
as learned self-seekers: as selfish individuals only seeking their own gain
Thus, option 4 is the correct choice.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 22

The attempt to conceive imaginatively a better ordering of human society than the destructive and cruel chaos in which mankind has hitherto existed is by no means modern: it is at least as old as Plato, whose ``Republic'' set the model for the Utopias of subsequent philosophers. Whoever contemplates the world in the light of an ideal—whether what he seeks be intellect, or art, or love, or simple happiness, or all together—must feel a great sorrow in the evils that men needlessly allow to continue, and—if he be a man of force and vital energy—an urgent desire to lead men to the realization of the good which inspires his creative vision. It is this desire which has been the primary force moving the pioneers of Socialism and Anarchism, as it moved the inventors of ideal commonwealths in the past. In this there is nothing new. What is new in Socialism and Anarchism, is that close relation of the ideal to the present sufferings of men, which has enabled powerful political movements to grow out of the hopes of solitary thinkers. It is this that makes Socialism and Anarchism important and it is this that makes them dangerous to those who batten, consciously or unconsciously upon the evils of our present order of society.

The great majority of men and women, in ordinary times, pass through life without ever contemplating or criticising, as a whole, either their own conditions or those of the world at large. They find themselves born into a certain place in society, and they accept what each day brings forth, without any effort of thought beyond what the immediate present requires. Almost as instinctively as the beasts of the field, they seek the satisfaction of the needs of the moment, without much forethought, and without considering that by sufficient effort the whole conditions of their lives could be changed. A certain percentage, guided by personal ambition, make the effort of thought and will which is necessary to place themselves among the more fortunate members of the community; but very few among these are seriously concerned to secure for all the advantages which they seek for themselves. It is only a few rare and exceptional men who have that kind of love toward mankind at large that makes them unable to endure patiently the general mass of evil and suffering, regardless of any relation it may have to their own lives. These few, driven by sympathetic pain, will seek, first in thought and then in action, for some way of escape, some new system of society by which life may become richer, more full of joy and less full of preventable evils than it is at present. But in the past such men have, as a rule, failed to interest the very victims of the injustices which they wished to remedy. The more unfortunate sections of the population have been ignorant, apathetic from excess of toil and weariness, timorous through the imminent danger of immediate punishment by the holders of power, and morally unreliable owing to the loss of self-respect resulting from their degradation. To create among such classes any conscious, deliberate effort after general amelioration might have seemed a hopeless task, and indeed in the past it has generally proved so. But the modern world, by the increase of education and the rise in the standard of comfort among wage-earners, has produced new conditions, more favorable than ever before to the demand for radical reconstruction. It is above all the Socialists, and in a lesser degree the Anarchists, who have become the exponents of this demand.

What is perhaps most remarkable in regard to both Socialism and Anarchism is the association of a widespread popular movement with ideals for a better world. The ideals have been elaborated, in the first instance, by solitary writers of books, and yet powerful sections of the wage-earning classes have accepted them as their guide in the practical affairs of the world. In regard to Socialism this is evident; but in regard to Anarchism it is only true with some qualification.

excerpted from ''proposed road to freedom'' by Bertand Russel

It can be inferred that hindrance(s) to the collective improvement of man was/were:

I. a weary population afraid of challenging established systems and viewpoints.
II. Basic poverty which made them focused only on their day to day survival.
III. low levels of education

A) Only I B) II & III ✓C) All of the above D) None of the above

Explanation:-

The answer for this question can be found in the parts highlighted below: They find themselves born into a certain place in society, and they accept what each day brings forth, without any effort of thought beyond what the immediate present requires. ***Almost as instinctively as the beasts of the field, they seek the satisfaction of the needs of the moment, without much forethought, and without considering that by sufficient effort the whole conditions of their lives could be changed. The more unfortunate sections of the population have been ignorant, apathetic from excess of toil and weariness, timorous through the imminent danger of immediate punishment by the holders of power, and morally unreliable owing to the loss of self-respect resulting from their degradation.*** *To create among such classes any conscious, deliberate effort after general amelioration might have seemed a hopeless task, and indeed in the past it has generally proved so.* ***But the modern world, by the increase of education and the rise in the standard of comfort among wage-earners, has produced new conditions, more favorable than ever before to the demand for radical reconstruction.***

II and III are actually derivations from the last line highlighted above. Effectively, this line states the condition of the modern world, a condition which was not present previously and acted as a hindrance. Thus, option 3 is the correct answer in this case.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 23

The attempt to conceive imaginatively a better ordering of human society than the destructive and cruel chaos in which mankind has hitherto existed is by no means modern: it is at least as old as Plato, whose ``Republic'' set the model for the Utopias of subsequent philosophers. Whoever contemplates the world in the light of an ideal—whether what he seeks be intellect, or art, or love, or simple happiness, or all together—must feel a great sorrow in the evils that men needlessly allow to continue, and—if he be a man of force and vital energy—an urgent desire to lead men to the realization of the good which inspires his creative vision. It is this desire which has been the primary force moving the pioneers of Socialism and Anarchism, as it moved the inventors of ideal commonwealths in the past. In this there is nothing new. What is new in Socialism and Anarchism, is that close relation of the ideal to the present sufferings of men, which has enabled powerful political movements to grow out of the hopes of solitary thinkers. It is this that makes Socialism and Anarchism important and it is this that makes them dangerous to those who batten, consciously or unconsciously upon the evils of our present order of society.

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What is perhaps most remarkable in regard to both Socialism and Anarchism is the association of a widespread popular movement with ideals for a better world. The ideals have been elaborated, in the first instance, by solitary writers of books, and yet powerful sections of the wage-earning classes have accepted them as their guide in the practical affairs of the world. In regard to Socialism this is evident; but in regard to Anarchism it is only true with some qualification.

excerpted from ''proposed road to freedom'' by Bertand Russel

It can be inferred from the passage that Socialism and Anarchism pose a threat to:

A) those who wish to work for their own selves
B) those who are afraid to follow the dictates of life without contemplating any change
C) those guided by personal ambition who place themselves about others
✓D) those who knowingly or unknowingly preserve the current status quo

Explanation:-
The answer to this question can be directly inferred from the lines: It is this that makes Socialism and Anarchism important, and it is this that makes them dangerous to those who batten, consciously or unconsciously upon the evils of our present order of society.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 24

The attempt to conceive imaginatively a better ordering of human society than the destructive and cruel chaos in which mankind has hitherto existed is by no means modern: it is at least as old as Plato, whose ``Republic'' set the model for the Utopias of subsequent philosophers. Whoever contemplates the world in the light of an ideal—whether what he seeks be intellect, or art, or love, or simple happiness, or all together—must feel a great sorrow in the evils that men needlessly allow to continue, and—if he be a man of force and vital energy—an urgent desire to lead men to the realization of the good which inspires his creative vision. It is this desire which has been the primary force moving the pioneers of Socialism and Anarchism, as it moved the inventors of ideal commonwealths in the past. In this there is nothing new. What is new in Socialism and Anarchism, is that close relation of the ideal to the present sufferings of men, which has enabled powerful political movements to grow out of the hopes of solitary thinkers. It is this that makes Socialism and Anarchism important and it is this that makes them dangerous to those who batten, consciously or unconsciously upon the evils of our present order of society.

The great majority of men and women, in ordinary times, pass through life without ever contemplating or criticising, as a whole, either their own conditions or those of the world at large. They find themselves born into a certain place in society, and they accept what each day brings forth, without any effort of thought beyond what the immediate present requires. Almost as instinctively as the beasts of the field, they seek the satisfaction of the needs of the moment, without much forethought, and without considering that by sufficient effort the whole conditions of their lives could be changed. A certain percentage, guided by personal ambition, make the effort of thought and will which is necessary to place themselves among the more fortunate members of the community; but very few among these are seriously concerned to secure for all the advantages which they seek for themselves. It is only a few rare and exceptional men who have that kind of love toward mankind at large that makes them unable to endure patiently the general mass of evil and suffering, regardless of any relation it may have to their own lives. These few, driven by sympathetic pain, will seek, first in thought and then in action, for some way of escape, some new system of society by which life may become richer, more full of joy and less full of preventable evils than it is at present. But in the past such men have, as a rule, failed to interest the very victims of the injustices which they wished to remedy. The more unfortunate sections of the population have been ignorant, apathetic from excess of toil and weariness, timorous through the imminent danger of immediate punishment by the holders of power, and morally unreliable owing to the loss of self-respect resulting from their degradation. To create among such classes any conscious, deliberate effort after general amelioration might have seemed a hopeless task, and indeed in the past it has generally proved so. But the modern world, by the increase of education and the rise in the standard of comfort among wage-earners, has produced new conditions, more favorable than ever before to the demand for radical reconstruction. It is above all the Socialists, and in a lesser degree the Anarchists, who have become the exponents of this demand.

What is perhaps most remarkable in regard to both Socialism and Anarchism is the association of a widespread popular movement with ideals for a better world. The ideals have been elaborated, in the first instance, by solitary writers of books, and yet powerful sections of the wage-earning classes have accepted them as their guide in the practical affairs of the world. In regard to Socialism this is evident; but in regard to Anarchism it is only true with some qualification.

excerpted from ''proposed road to freedom'' by Bertand Russel

If you were to ask one pertinent question to the author of the passage, what would it be?

A) What is Socialism and Anarchism? B) Who are the men behind Socialism and Anarchism?
✓C) When would the ideals of a better world be adopted readily in human life? D) Are Socialism and Anarchism a myth?

Explanation:-
This is a different question type that requires innovative thinking. First things first, what is the central idea of the passage? The passage revolves around Socialism and Anarchism for sure but at the core of the passage is the idea that human society is given to better ordering now, and things are slowly beginning to change, and a better human life and ideals have found acceptance. The next logical step would be with regards to these ideals being implemented on a larger scale for the betterment of human life and society. This thought process is reflected by option 3. The other options deflect from the central theme of the passage, and rather

focus on Socialism/Anarchism instead. These are important but the central question is when they have a positive impact on human life.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 25

1. Chemistry gave us medicine and more fresh food.
2. Psychology is still taking baby steps, designing empirical tests of unsurprising observations.
3. Physics gave us electricity, skyscrapers, and the Internet.
4. It may be too much to expect science to reliably save marriages, but how desperately we need the secret to stopping people from burning others alive.
5. Our fascination with the brain seems to come from a longing to make psychology more like a hard science and hence, we assume, more useful.

A) 53124 B) C) D)

Explanation:-
In the given case, we can clearly see that statements 3 and 1 will be placed next to each other. Also, these two statements follow statement E as these represent the examples of science being useful. So we have one set of connected statements: 5, 3 and 1. Also, between statement 5 and 4, we find that statement 5 is the more generic of the two and is the apt opening sentence for the given paragraph. Thus, we have identified our correct answer: 53124

DIRECTIONS for the question: *The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, from a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.*

Question No. : 26

1. Typically 50 percent of the class expects their performance to be below the median and a quarter of the class expects to perform in one of the top two deciles.
2. Ninety percent of all drivers think they are above average behind the wheel.
3. About 94 percent of professors at a large university were found to believe that they are better than the average professor.
4. Around the time of the wedding ceremony, almost all couples believe that there is approximately a zero percent chance that their marriage will end in divorce.

A) 1 B) C) D)

Explanation:-
The theme over here is that no one thinks of herself as below average. 1 goes against the theme, as it expects half the class to be below median (50^{th} percentile)

2, 3, 4 all revolve around the theme of none below average.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 27

1. The same might be said, with more justice, of the prevalent version of atheism.
2. The racial theories promoted by atheists in the past have been consigned to the memory hole – and today's most influential atheists would no more endorse racist biology than they would be seen following the guidance of an astrologer.
3. It has often been observed that Christianity follows changing moral fashions, all the while believing that it stands apart from the world.
4. But they have not renounced the conviction that human values must be based in science; now it is liberal values which receive that accolade.
5. If an earlier generation of unbelievers shared the racial prejudices of their time and elevated them to the status of scientific truths, evangelical atheists do the same with the liberal values to which western societies subscribe today – while looking with contempt upon "backward" cultures that have not abandoned religion.

A) 31524 B) C) D)

Explanation:-
In this case, sentence 3 is the generic opening sentence of the paragraph and it is followed by statement 1. You can also observe that statements 1, 2, 4 and 5 are all about atheism and thus connect with each other. The next group of connected statements is 5 2 and they are linked by the common reference to racial theories. Statement 4 then completes the sentiment put forward in the pair 52 and thus we have a set of three connected statements, 5, 2, 4. Using this information, we can identify option 2 as the correct answer. Remember, statement 3 cannot be placed between any of sentences as it does not connect with any other sentence except 1.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 28

1. When less was known of animals and plants the discovery of new species was the great object.
2. The discovery of a new species as such does not change a feature in the science of natural history, any more than the discovery of a new asteroid changes the character of the problems to be investigated by astronomers.
3. It is merely adding to the enumeration of objects.
4. We should look rather for the fundamental relations among animals; the number of species we may find is of importance only so far as they explain the distribution and limitation of different genera and families, their relations to each other and to the physical conditions under which they live.
5. This has been carried too far, and is now almost the lowest kind of scientific work.

A) 15234 B) C) D)

Explanation:-
This in 5 refers to the discovery of new species mentioned in 1.
Hence 1 and 5 will be together. In 4, the word rather indicates that something opposite to what is mentioned in 4 must be present in the paragraph somewhere.
4 states that one should look at the fundamental relations – opposite to simply counting them – which is enumeration of object mentioned in 3.
Hence the sequence is 15234.

DIRECTIONS for the question: *The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, from a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.*

Question No. : 29

1. Creating monetizable intellectual property affords a significant incentive to all the stakeholders, thus benefiting all of humanity.
2. Before copyright and patent laws, no one could own songs, stories or ideas.
3. Thus, there needs to be a strong economic incentive sufficient for private investment to develop affordable human transport to the Moon and Mars.
4. The passage of those laws, creating intellectual property, made whole industries possible and added greatly to the world's wealth from things that had previously been valueless.

A) 3 B) C) D)

Explanation:-
The lines 2, 4 and 1 form a logically arranged paragraph here. Statement 3 is an odd man out with its mention of travel to the Moon.

DIRECTIONS for the question: *The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, from a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.*

Question No. : 30

1. A specific action that will help you to be more accepting is to find and dissolve your core beliefs about how people should be.
2. You may find it more productive if you begin with an inventory of the expectations of other people.
3. What conceptual idea is in your mind about how the world should be and when should it be that way?
4. These artificial standards in the mind become the basis for judgment and emotional reactions.

A) 2 B) C) D)

Explanation:-
The lines 1, 3 and 4 (1-3-4) progressively talk about how questioning one's own beliefs about how the world should be create better acceptance. On the other hand, statement 2 speaks of others' expectations of you.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 31

1. Even while Americans' trust in mass media continues to plummet, journalists enjoy a kind of heroic fame that would baffle their British counterparts.
2. A whole genre of film exists in the US celebrating the heroism of journalists, from All the President's Men to Good Night, and Good Luck.
3. In Britain, probably the most popular depiction of journalists came from Spitting Image, where they were snuffling pigs in pork-pie hats.
4. Whereas in Britain journalists are generally viewed as occupying a place on the food chain somewhere between bottom-feeders and cockroaches, in America there remains, still, a certain idealisation of journalists, protected by a gilded halo hammered out by sentimental memories of Edward R Murrow and Walter Cronkite.
5. Television anchors and commentators, from Rachel Maddow on the left to Sean Hannity on the right, are lionised in a way that, say, Huw Edwards, is, quite frankly, not.

A) 41523 B) C) D)

Explanation:-
The first pair of sentences that you need to identify is 15 as the two are linked by the common sentiment of the heroic description of news anchors. The next pair that you should identify is 23, which links the films made on journalists.

DIRECTIONS for the question: *Identify the most appropriate summary for the paragraph.*

Question No. : 32

According to the structural strain theory, societies are characterized by both culture and social structure. Culture establishes goals for people in society while social structure provides (or fails to provide) the means for people to achieve those goals. In a well-integrated society, people use accepted and appropriate means to achieve the goals that society establishes. In this case, the goals and the means of the society are in balance. It is when the goals and means are not in balance with each other that deviance is likely to occur. This imbalance between cultural goals and structurally available means can actually lead an individual into deviant behavior.

1. According to the structural strain theory, deviant behavior is an outcome of the incapacity of society to maintain apt balance for itself.
2. According to the structural strain theory, deviant behavior is an outcome of the incapability of society to balance itself.
3. According to the structural strain theory, deviant behavior is an outcome of the inability of society to maintain apt balance by itself.
4. According to the structural strain theory, deviant behavior is an outcome of the inability of society to balance itself.

A) 4 B) C) D)

Explanation:-
The first aspect of the question that you need to think about is the usage of the words incapacity, incapability and inability. Which of these words is applicable in the given context? In the given context, inability is the best fit as there is no reference to the society not being capable or not having the capacity to maintain balance. To understand this, focus on the line: It is when the goals and means are not in balance with each other that deviance is likely to occur.
This leaves us with two options, option 3 and 4. Option 3 commits one small mistake: 'society to maintain apt balance by itself'. The wording in the option implies that society is not managing to balance itself. This is something that is not implied in the

passage. The passage talks about balance in society, not about society trying to balance itself.

DIRECTIONS for the question: *Identify the most appropriate summary for the paragraph.*

Question No. : 33

Conflict theory emphasizes the role of coercion and power in producing social order. This perspective is derived from the works of Karl Marx, who saw society as fragmented into groups that compete for social and economic resources. Social order is maintained by domination, with power in the hands of those with the greatest political, economic, and social resources. When consensus exists, it is attributable to people being united around common interests, often in opposition to other groups. Marx theorized that the work of producing consensus was done in the "superstructure" of society--which is composed of social institutions, political structures, and culture--and what it produced consensus for was the "base," the economic relations of production. Following on the heels of Marx, Italian scholar and activist Antonio Gramsci argued that consensus to rule is achieved in large part through cultural hegemony, which refers to the dominant group's ability to attain consent to their rule through ideas, norms, values, and beliefs..

1. Conflict theory, as established by Marx and taken forward by Gramsci, highlights how coercion and power are used by the powerful and dominant groups of society to establish social order.
2. Conflict theory, a theory with major derivations of Marx and Gramsci, goes on to establish the rules for establishment of social order and how power and force are used to structure society.
3. Conflict theory, in part driven by the works of Marx and Gramsci, explores the superstructures of society and highlights how those in power take control of social structures and effectively run the world.
4. Conflict theory, with contributions from scholars such as Marx and Gramsci, highlights how force and common interests brings together powerful elements in societies, which in turn use their dominion to produce social order.

A) 4 B) C) D)

Explanation:-
Option 1 incorrectly quotes Marx and Gramsci as founders of conflict theory.
Option 2 is incorrect as there are no rules mentioned in the passage (rules with respect to conflict theory).
Option 3 sporadically picks up words from the paragraph but actually does not stick to the main idea of the paragraph.
Option 4 is the apt choice in this case as it covers all the important aspects of the paragraph.

DIRECTIONS for the question: *Identify the most appropriate summary for the paragraph.*

Question No. : 34

According to a 2006 poll conducted by Newsweek, a whopping 43% of Americans believe that dreams reveal unconscious desires and wishes. Famed psychoanalyst Sigmund Freud described dreams as the royal road to the unconscious and suggested that by studying the obvious content of dreams, we could then bring to light the hidden and unconscious desires that lead to neurosis. Analyzing dream symbols and ascribing meaning has become a popular source of both entertainment and self-reflection in popular culture. Do dreams really have hidden meanings? Can you learn your unconscious wishes and desires by interpreting your dreams? While most modern theories of dreams would suggest that the answer is no, this hasn't stopped interpreters and analysts from publishing a whole host of dream dictionaries that purport to identify what these common dream themes and symbols really mean.

1. The analysis of dream content and its purported link to revealing hidden meanings and the unconscious wishes is something that has fascinated one and all, and there is a long list of commentators and analysts, such as Freud, who have delved in this area.
2. Though the importance of dreams in analyzing the unconscious and revealing hidden desires has been discounted, numerous interpreters and analysts continue to highlight the importance of dreams through their various works, adding to the lineage of work done by the likes of Freud.
3. Even though the futility of analyzing dreams to explore the unconscious and reveal hidden desires has been has been suitably highlighted, many analysts still continue to harp the old tune of the importance of dreams and use the works of likes of such as Sigmund Freud.
4. As the works of Sigmund Freud and many others in the modern world have suggested, the content of dreams has a co-relation with the unconscious and revealing hidden meanings, though this is still disputed by some modern theories which do not accept the importance of dreams.

A) 2 B) C) D)

Explanation:-
Option 1 simply narrates the context but does not highlight any viewpoint on analysis of dream content (as done by the paragraph).
Option 3 is too extreme to begin with (the mention of futility of analyzing dreams) and that does not gel with the sentiment expressed in the passage. Also, the passage does not suggest that modern theorists use the works of Freud.
Option 4 reverses the intent of the paragraph, which clearly downplays the importance of dream analysis.
Option 2 is the apt choice here, as it represents the central idea of the paragraph.

Section : DI & Reasoning

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 35

Ram, Shyam, Mohan and Geeta are playing a game of numbers. In each round, a dealer selects a number from 1 to 20 at random. Ram wins if the number selected is between 1 and 15, both inclusive; Shyam wins if the number selected is between 6 and 15, both inclusive; Mohan wins if the number selected is between 3 and 15, both inclusive; Geeta wins if the number selected is between 16 and 20, both inclusive.

If Ram wins, he earns Rs. 1000, and loses Rs. 5000 otherwise; if Shyam wins, he earns Rs. 5000, and loses Rs. 1000 otherwise; if Mohan wins, he earns Rs. 2000, and loses Rs. 2000 otherwise; if Geeta wins, she earns Rs. 10000, and loses Rs. 1000 otherwise.

For 5 rounds, the dealer selected 5 different numbers at random. After these five rounds, Ram had a loss of Rs. 1000, Shyam had a profit of Rs. 1000 and Mohan had a profit of Rs. 2000.

How many rounds did Ram win?

A) 1 B) 2 C) 3 ✓D) 4

Explanation:-
Each round, Ram either wins Rs. 1000 or loses Rs. 5000. Since he has lost Rs. 1000 after 5 rounds, he must have won 4 rounds and lost 1 round.Each round, Shyam either wins Rs. 5000 or loses Rs. 1000. Since he has won Rs. 1000 after 5 rounds, he must have won 1 round and lost 4 rounds. Each round, Mohan either wins Rs. 2000 or loses Rs. 2000. Since he has won Rs. 2000 after 5 rounds, he must have won 3 rounds and lost 2 rounds. For the 4 rounds that Ram won, we know that the dealer must have selected a number between 1 and 15, both inclusive and for the 1 round that Ram lost, the dealer must have selected a number between 16 and 20, both inclusive. This means that Geeta lost 4 rounds and won 1 round. We can now tabulate the data as shown.

	Round		Money (Rs.)		
	W	L	W	L	Total
Ram	4	1	4000	5000	–1000
Shyam	1	4	5000	4000	1000
Mohan	3	2	6000	4000	2000
Geeta	1	4	10000	4000	6000

Ram won 4 rounds.

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 36

Ram, Shyam, Mohan and Geeta are playing a game of numbers. In each round, a dealer selects a number from 1 to 20 at random. Ram wins if the number selected is between 1 and 15, both inclusive; Shyam wins if the number selected is between 6 and 15, both inclusive; Mohan wins if the number selected is between 3 and 15, both inclusive; Geeta wins if the number selected is between 16 and 20, both inclusive.

If Ram wins, he earns Rs. 1000, and loses Rs. 5000 otherwise; if Shyam wins, he earns Rs. 5000, and loses Rs. 1000 otherwise; if Mohan wins, he earns Rs. 2000, and loses Rs. 2000 otherwise; if Geeta wins, she earns Rs. 10000, and loses Rs. 1000 otherwise.

For 5 rounds, the dealer selected 5 different numbers at random. After these five rounds, Ram had a loss of Rs. 1000, Shyam had a profit of Rs. 1000 and Mohan had a profit of Rs. 2000.

How much money did the dealer earn or lose?

✔A) Rs. 8000 B) Rs. 9000 C) Rs. 6000 D) Rs. 7000

Explanation:-
Each round, Ram either wins Rs. 1000 or loses Rs. 5000. Since he has lost Rs. 1000 after 5 rounds, he must have won 4 rounds and lost 1 round.Each round, Shyam either wins Rs. 5000 or loses Rs. 1000. Since he has won Rs. 1000 after 5 rounds, he must have won 1 round and lost 4 rounds. Each round, Mohan either wins Rs. 2000 or loses Rs. 2000. Since he has won Rs. 2000 after 5 rounds, he must have won 3 rounds and lost 2 rounds. For the 4 rounds that Ram won, we know that the dealer must have selected a number between 1 and 15, both inclusive and for the 1 round that Ram lost, the dealer must have selected a number between 16 and 20, both inclusive. This means that Geeta lost 4 rounds and won 1 round. We can now tabulate the data as shown.

	Round		Money (Rs.)		
	W	L	W	L	Total
Ram	4	1	4000	5000	–1000
Shyam	1	4	5000	4000	1000
Mohan	3	2	6000	4000	2000
Geeta	1	4	10000	4000	6000

Referring to the total column above, the 4 players together won –1000 + 1000 + 2000 + 6000 = Rs. 8000. This means that the dealer lost Rs. 8000.

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 37

Ram, Shyam, Mohan and Geeta are playing a game of numbers. In each round, a dealer selects a number from 1 to 20 at random. Ram wins if the number selected is between 1 and 15, both inclusive; Shyam wins if the number selected is between 6 and 15, both inclusive; Mohan wins if the number selected is between 3 and 15, both inclusive; Geeta wins if the number selected is between 16 and 20, both inclusive.

If Ram wins, he earns Rs. 1000, and loses Rs. 5000 otherwise; if Shyam wins, he earns Rs. 5000, and loses Rs. 1000 otherwise; if Mohan wins, he earns Rs. 2000, and loses Rs. 2000 otherwise; if Geeta wins, she earns Rs. 10000, and loses Rs. 1000 otherwise.

For 5 rounds, the dealer selected 5 different numbers at random. After these five rounds, Ram had a loss of Rs. 1000, Shyam had a profit of Rs. 1000 and Mohan had a profit of Rs. 2000.

If Ram, Shyam and Mohan are clubbed in team A and Geeta forms team B, which team won after the 5 rounds and by how much?

A) Team A, Rs. 6000 ✔B) Team B, Rs. 4000 C) Team A, Rs. 4000 D) Team B, Rs. 6000

Explanation:-
Each round, Ram either wins Rs. 1000 or loses Rs. 5000. Since he has lost Rs. 1000 after 5 rounds, he must have won 4 rounds and lost 1 round.Each round, Shyam either wins Rs. 5000 or loses Rs. 1000. Since he has won Rs. 1000 after 5 rounds, he must have won 1 round and lost 4 rounds. Each round, Mohan either wins Rs. 2000 or loses Rs. 2000. Since he has won Rs. 2000 after 5 rounds, he must have won 3 rounds and lost 2 rounds. For the 4 rounds that Ram won, we know that the dealer must have selected a number between 1 and 15, both inclusive and for the 1 round that Ram lost, the dealer must have selected a number between 16 and 20, both inclusive. This means that Geeta lost 4 rounds and won 1 round. We can now tabulate the data as shown.

	Round	Money (Rs.)

	W	L	W	L	Total
Ram	4	1	4000	5000	–1000
Shyam	1	4	5000	4000	1000
Mohan	3	2	6000	4000	2000
Geeta	1	4	10000	4000	6000

Ram, Shyam and Mohan together win Rs. 2000 and Geeta wins Rs. 6000. So, Team B wins by Rs. 4000.

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 38

Ram, Shyam, Mohan and Geeta are playing a game of numbers. In each round, a dealer selects a number from 1 to 20 at random. Ram wins if the number selected is between 1 and 15, both inclusive; Shyam wins if the number selected is between 6 and 15, both inclusive; Mohan wins if the number selected is between 3 and 15, both inclusive; Geeta wins if the number selected is between 16 and 20, both inclusive.

If Ram wins, he earns Rs. 1000, and loses Rs. 5000 otherwise; if Shyam wins, he earns Rs. 5000, and loses Rs. 1000 otherwise; if Mohan wins, he earns Rs. 2000, and loses Rs. 2000 otherwise; if Geeta wins, she earns Rs. 10000, and loses Rs. 1000 otherwise.

For 5 rounds, the dealer selected 5 different numbers at random. After these five rounds, Ram had a loss of Rs. 1000, Shyam had a profit of Rs. 1000 and Mohan had a profit of Rs. 2000.

Which of the following statements is true?

A) Mohan won twice as many rounds as Geeta won and lost thrice as many rounds as Ram lost
B) Shyam won half as many rounds as Geeta lost and lost as many rounds as Ram won
✓C) Geeta won as many rounds as Ram lost and lost as many rounds as Shyam lost
D) Ram won as many rounds as Geeta lost and lost half as many rounds as Mohan won

Explanation:-
Each round, Ram either wins Rs. 1000 or loses Rs. 5000. Since he has lost Rs. 1000 after 5 rounds, he must have won 4 rounds and lost 1 round.Each round, Shyam either wins Rs. 5000 or loses Rs. 1000. Since he has won Rs. 1000 after 5 rounds, he must have won 1 round and lost 4 rounds. Each round, Mohan either wins Rs. 2000 or loses Rs. 2000. Since he has won Rs. 2000 after 5 rounds, he must have won 3 rounds and lost 2 rounds. For the 4 rounds that Ram won, we know that the dealer must have selected a number between 1 and 15, both inclusive and for the 1 round that Ram lost, the dealer must have selected a number between 16 and 20, both inclusive. This means that Geeta lost 4 rounds and won 1 round. We can now tabulate the data as shown.

	Round		Money (Rs.)		
	W	L	W	L	Total
Ram	4	1	4000	5000	–1000
Shyam	1	4	5000	4000	1000
Mohan	3	2	6000	4000	2000
Geeta	1	4	10000	4000	6000

Geeta won 1 round and Ram lost 1 round. Geeta lost 4 rounds and Shyam lost 4 rounds. So option 3 is correct.

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 39

The Principal of a school, Prof. Roy, asked Prof. Gupta to provide him with the analysis of the results of recently completed exams in the school, which was written by 108 students. Prof. Gupta analysed the performance of students in five different subjects-

Physics, Chemistry, Biology, Maths and English. The following are some of his observations.

1. The students who passed in Maths failed in all other subjects except English.
2. The students who did not fail in Physics, passed in Chemistry.
3. The number of students who failed in four subjects is seven less than those who did not pass in Chemistry. The number of students who passed in three subjects is 18.
4. The students who failed in English passed in Chemistry and none passed in both the subjects.
5. The number of students who passed only in Chemistry is 17 and those passed in Maths is 13.
6. The number of students who passed in Biology is 46 and the number of students who passed only in English is 10.
7. None of these students passed only in Biology.

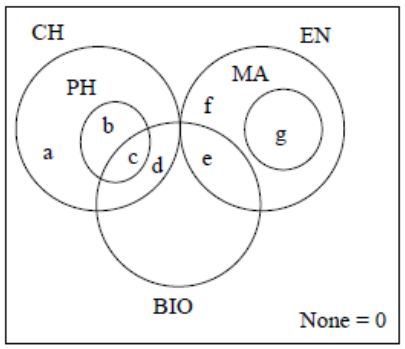
How many students are passed in exactly two subjects? (in numerical value)

A) 63 B) C) D)

Explanation:-

The following venn diagram represents the no. of passed candidates in given subjects.

From (1), (2) and (4), the information can be represented as follows:



From (3), the number of students who failed in four subjects is equal to the number of students who passed in only one subject = a + f.

The number of students who failed in Chemistry = e + f + g

$a + f = e + f + g - 7 \Rightarrow a + 7 = e + g$ ------(1)

From (4), c = 18 ------ (2)

From (6), c + d + e = 46

$\Rightarrow d + e = 28$ -------(3)

From (5), a = 17 and g = 13, f = 10

a = 17, g = 13

$\Rightarrow e = 11$ *(from (1))* $\Rightarrow d = 17$ *(from (3))*

As $a + b + c + d + e + f + g = 108 \Rightarrow b = 22$

The number of students who passed in exactly two subjects $= b + d + e + g = 22 + 17 + 11 + 13 = 63$.

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 40

The Principal of a school, Prof. Roy, asked Prof. Gupta to provide him with the analysis of the results of recently completed exams in the school, which was written by 108 students. Prof. Gupta analysed the performance of students in five different subjects-

Physics, Chemistry, Biology, Maths and English. The following are some of his observations.

1. The students who passed in Maths failed in all other subjects except English.
2. The students who did not fail in Physics, passed in Chemistry.
3. The number of students who failed in four subjects is seven less than those who did not pass in Chemistry. The number of students who passed in three subjects is 18.
4. The students who failed in English passed in Chemistry and none passed in both the subjects.
5. The number of students who passed only in Chemistry is 17 and those passed in Maths is 13.
6. The number of students who passed in Biology is 46 and the number of students who passed only in English is 10.
7. None of these students passed only in Biology.

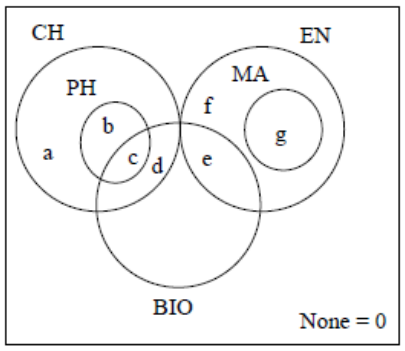
How many students who passed in Physics also passed in atleast one of the other subjects? (in numerical value)

A) 40 B) C) D)

Explanation:-

The following venn diagram represents the no. of passed candidates in given subjects.

From (1), (2) and (4), the information can be represented as follows:



From (3), the number of students who failed in four subjects is equal to the number of students who passed in only one subject = a + f.

The number of students who failed in Chemistry = e + f + g

$a + f = e + f + g - 7 \Rightarrow a + 7 = e + g$ ------(1)

From (4), c = 18 ------ (2)

From (6), c + d + e = 46

$\Rightarrow d + e = 28$ -------(3)

From (5), a = 17 and g = 13, f = 10

a = 17, g = 13

$\Rightarrow e = 11$ *(from (1))* $\Rightarrow d = 17$ *(from (3))*

As $a + b + c + d + e + f + g = 108 \Rightarrow b = 22$

The required number of students = b + c = 22 + 18 = 40

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 41

The Principal of a school, Prof. Roy, asked Prof. Gupta to provide him with the analysis of the results of recently completed exams in the school, which was written by 108 students. Prof. Gupta analysed the performance of students in five different subjects-

Physics, Chemistry, Biology, Maths and English. The following are some of his observations.

1. The students who passed in Maths failed in all other subjects except English.
2. The students who did not fail in Physics, passed in Chemistry.
3. The number of students who failed in four subjects is seven less than those who did not pass in Chemistry. The number of students who passed in three subjects is 18.
4. The students who failed in English passed in Chemistry and none passed in both the subjects.
5. The number of students who passed only in Chemistry is 17 and those passed in Maths is 13.
6. The number of students who passed in Biology is 46 and the number of students who passed only in English is 10.
7. None of these students passed only in Biology.

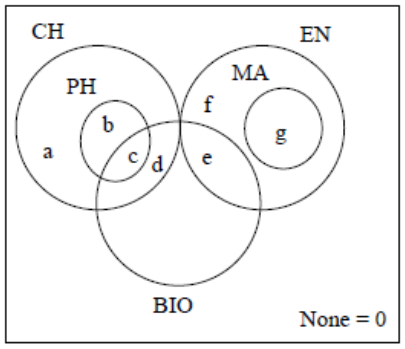
How many students passed in all subjects except Chemistry and Maths? (in numerical value)

A) 21 B) C) D)

Explanation:-

The following venn diagram represents the no. of passed candidates in given subjects.

From (1), (2) and (4), the information can be represented as follows:



From (3), the number of students who failed in four subjects is equal to the number of students who passed in only one subject = a + f.
The number of students who failed in Chemistry = e + f + g
a + f = e + f + g – 7 ⇒ a + 7 = e + g ------(1)
From (4), c = 18 ------ (2)
From (6), c + d + e = 46
⇒ d + e = 28 -------(3)
From (5), a = 17 and g = 13, f = 10
a = 17, g = 13
⇒ e = 11 (from (1)) ⇒ d = 17 (from (3))
As a + b + c + d + e + f + g = 108 ⇒ b = 22

The required number of students = e + f = 11 + 10 = 21

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 42

The Principal of a school, Prof. Roy, asked Prof. Gupta to provide him with the analysis of the results of recently completed exams in the school, which was written by 108 students. Prof. Gupta analysed the performance of students in five different subjects-

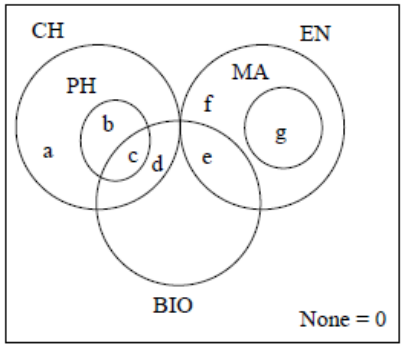
Physics, Chemistry, Biology, Maths and English. The following are some of his observations.

1. The students who passed in Maths failed in all other subjects except English.
2. The students who did not fail in Physics, passed in Chemistry.
3. The number of students who failed in four subjects is seven less than those who did not pass in Chemistry. The number of students who passed in three subjects is 18.
4. The students who failed in English passed in Chemistry and none passed in both the subjects.
5. The number of students who passed only in Chemistry is 17 and those passed in Maths is 13.
6. The number of students who passed in Biology is 46 and the number of students who passed only in English is 10.
7. None of these students passed only in Biology.

How many students passed in Biology but not in Physics? (in numerical value)

A) 28 B) C) D)

Explanation:-
The following venn diagram represents the no. of passed candidates in given subjects.
From (1), (2) and (4), the information can be represented as follows:



From (3), the number of students who failed in four subjects is equal to the number of students who passed in only one subject = a + f.
The number of students who failed in Chemistry = e + f + g
a + f = e + f + g – 7 ⇒ a + 7 = e + g ------(1)
From (4), c = 18 ------ (2)
From (6), c + d + e = 46
⇒ d + e = 28 -------(3)
From (5), a = 17 and g = 13, f = 10
a = 17, g = 13
⇒ e = 11 (from (1)) ⇒ d = 17 (from (3))
As a + b + c + d + e + f + g = 108 ⇒ b = 22
The required number of students = d + e = 17 + 11 = 28

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 43

The Principal of a school, Prof. Roy, asked Prof. Gupta to provide him with the analysis of the results of recently completed exams in the school, which was written by 108 students. Prof. Gupta analysed the performance of students in five different subjects-

Physics, Chemistry, Biology, Maths and English. The following are some of his observations.

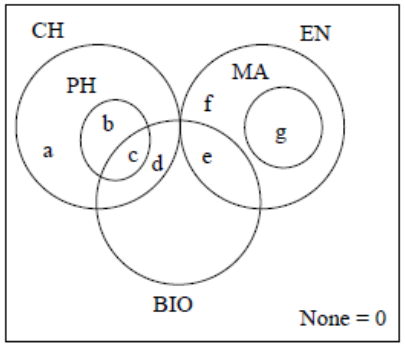
1. The students who passed in Maths failed in all other subjects except English.
2. The students who did not fail in Physics, passed in Chemistry.
3. The number of students who failed in four subjects is seven less than those who did not pass in Chemistry. The number of students who passed in three subjects is 18.
4. The students who failed in English passed in Chemistry and none passed in both the subjects.
5. The number of students who passed only in Chemistry is 17 and those passed in Maths is 13.
6. The number of students who passed in Biology is 46 and the number of students who passed only in English is 10.
7. None of these students passed only in Biology.

Which of the following statements is/are true?

I. The number of students who passed in atleast two subjects is 81.
II. The number of students who passed in only Biology and Chemistry is 17.

A) Only I B) Only II ✓C) Both I and II D) Neither I nor II

Explanation:-
The following venn diagram represents the no. of passed candidates in given subjects.
From (1), (2) and (4), the information can be represented as follows:



From (3), the number of students who failed in four subjects is equal to the number of students who passed in only one subject = a + f.
The number of students who failed in Chemistry = e + f + g
a + f = e + f + g – 7 ⇒ a + 7 = e + g ------(1)
From (4), c = 18 ------ (2)
From (6), c + d + e = 46
⇒ d + e = 28 -------(3)
From (5), a = 17 and g = 13, f = 10
a = 17, g = 13

⇒ e = 11 (from (1)) ⇒ d = 17 (from (3))
As a + b + c + d + e + f + g = 108 ⇒ b = 22
(I) b + d + e + g + c = 22 + 17 + 11 + 13 + 18 = 81, true
(II) d = 17, true ⇒ Both (I) and (II) are true

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 44

In a factory there are six polishing machines - A, B, C, D, E and F. The factory produces item X. Polishing is the last step of manufacturing process. Each of the machines A, B, C, D, E and F takes 3, 2, 3, 1, 2 and 4 hours respectively to polish one unit of X, which is called one polish time. After polishing each unit the machines need a rest of 3, 1, 1, 2, 2 and 2 hours respectively. Every machine starts polishing at 6.00 a.m. and no machine works after 4.00 p.m. Each unit of item X needs to be polished exactly thrice. These three polishing should be done on three different machines. There should be a time gap of at least two hours between two successive polishings of a unit. The total time taken for an item to be polished is the time taken from the starting of the first polish to the end of the third polish. No polish time has any break in between. No machine takes more or less time than the stipulated rest time between two consecutive polishings in a day.

In how many different ways can an item be polished by any three different machines, within a day? (in numerical value)

A) 4 B) C) D)

Explanation:-
Let us first make a list of the timings in a day when a particular machine works. The letters in each box represents the time period.

A	(a) 6am to 9am	(b) 12noon to 3pm		
B	(c) 6am to 8am	(d) 9am to 11am	(e) 12 noon to 2pm	
C	(f) 6am to 9am	(g) 10am to 1pm		
D	(h) 6am to 7am	(i) 9am to 10am	(j) 12noon to 1pm	(k) 3pm to 4pm
E	(l) 6am to 8am	(m) 10am to 12 noon	(n) 2pm to 4pm	
F	(p) 6am to 10am	(q) 12 noon to 4pm		

If an item started being polished at 6:00 am, then in the following ways the polishing can be completed within that day.
(i) c → g → k *(ii) c → m → k*
(iii) h → d → n *(iv) l → g → k*
∴ There are four possible ways.

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 45

In a factory there are six polishing machines - A, B, C, D, E and F. The factory produces item X. Polishing is the last step of manufacturing process. Each of the machines A, B, C, D, E and F takes 3, 2, 3, 1, 2 and 4 hours respectively to polish one unit of X, which is called one polish time. After polishing each unit the machines need a rest of 3, 1, 1, 2, 2 and 2 hours respectively. Every machine starts polishing at 6.00 a.m. and no machine works after 4.00 p.m. Each unit of item X needs to be polished exactly thrice. These three polishing should be done on three different machines. There should be a time gap of at least two hours between two successive polishings of a unit. The total time taken for an item to be polished is the time taken from the starting of the first polish to the end of the third polish. No polish time has any break in between. No machine takes more or less time than the stipulated rest time between two consecutive polishings in a day.

If the polishing of an item is started at 9:00 am on a day, then what is the earliest time by which the polishing will be completed?

✓A) 7:00 am on the next day B) 8:00 am on the next day C) 4:00 pm on the same day D) 9:00 am on the next day

Explanation:-
Let us first make a list of the timings in a day when a particular machine works. The letters in each box represents the time period.

A	(a) 6am to 9am	(b) 12noon to 3pm		
B	(c) 6am to 8am	(d) 9am to 11am	(e) 12 noon to 2pm	
C	(f) 6am to 9am	(g) 10am to 1pm		
D	(h) 6am to 7am	(i) 9am to 10am	(j) 12noon to 1pm	(k) 3pm to 4pm
E	(l) 6am to 8am	(m) 10am to 12 noon	(n) 2pm to 4pm	
F	(p) 6am to 10am	(q) 12 noon to 4pm		

The polishing will be completed by the earliest time. If the sequence in d → n → h, in which case, it will be completed by 7:00 am on the next day.

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 46

In a factory there are six polishing machines - A, B, C, D, E and F. The factory produces item X. Polishing is the last step of manufacturing process. Each of the machines A, B, C, D, E and F takes 3, 2, 3, 1, 2 and 4 hours respectively to polish one unit of X, which is called one polish time. After polishing each unit the machines need a rest of 3, 1, 1, 2, 2 and 2 hours respectively. Every machine starts polishing at 6.00 a.m. and no machine works after 4.00 p.m. Each unit of item X needs to be polished exactly thrice. These three polishing should be done on three different machines. There should be a time gap of at least two hours between two successive polishings of a unit. The total time taken for an item to be polished is the time taken from the starting of the first polish to the end of the third polish. No polish time has any break in between. No machine takes more or less time than the stipulated rest time between two consecutive polishings in a day.

If the total time taken for completion of polishing an item is the minimum possible, then what can be maximum possible value (in hours) of the sum of the time gaps between any two successive polishings? (in numerical value)

A) 5 B) C) D)

Explanation:-
Let us first make a list of the timings in a day when a particular machine works. The letters in each box represents the time period.

A	(a) 6am to 9am	(b) 12noon to 3pm		
B	(c) 6am to 8am	(d) 9am to 11am	(e) 12 noon to 2pm	
C	(f) 6am to 9am	(g) 10am to 1pm		
D	(h) 6am to 7am	(i) 9am to 10am	(j) 12noon to 1pm	(k) 3pm to 4pm
E	(l) 6am to 8am	(m) 10am to 12 noon	(n) 2pm to 4pm	
F	(p) 6am to 10am	(q) 12 noon to 4pm		

For each of the cases referred earlier the sum of the time gaps are as follows.
(i) 4 hours (ii) 5 hours
(iii) 5 hours (iv) 4 hours
∴ Maximum value of the sum of the time gaps is 5 hours

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 47

In a factory there are six polishing machines - A, B, C, D, E and F. The factory produces item X. Polishing is the last step of manufacturing process. Each of the machines A, B, C, D, E and F takes 3, 2, 3, 1, 2 and 4 hours respectively to polish one unit of X, which is called one polish time. After polishing each unit the machines need a rest of 3, 1, 1, 2, 2 and 2 hours respectively. Every machine starts polishing at 6.00 a.m. and no machine works after 4.00 p.m. Each unit of item X needs to be polished exactly thrice. These three polishing should be done on three different machines. There should be a time gap of at least two hours between two successive polishings of a unit. The total time taken for an item to be polished is the time taken from the starting of the first polish to the end of the third polish. No polish time has any break in between. No machine takes more or less time than the stipulated rest time between two consecutive polishings in a day.

If, due to bad weather, a time gap of at least three hours is needed between every two successive polishings of an item, then what is the least total time required for polishing of the item? (in hours)

A) 22 B) C) D)

Explanation:-
Let us first make a list of the timings in a day when a particular machine works. The letters in each box represents the time period.

A	(a) 6am to 9am	(b) 12noon to 3pm		
B	(c) 6am to 8am	(d) 9am to 11am	(e) 12 noon to 2pm	
C	(f) 6am to 9am	(g) 10am to 1pm		
D	(h) 6am to 7am	(i) 9am to 10am	(j) 12noon to 1pm	(k) 3pm to 4pm
E	(l) 6am to 8am	(m) 10am to 12 noon	(n) 2pm to 4pm	
F	(p) 6am to 10am	(q) 12 noon to 4pm		

In this case, the sum of the time gaps is at least 6 hours, hence it cannot be completed in a single day. So we have to complete two polishings in a single day. If the polishings is started at 10:00 am i.e., m and followed by k, two polishing will be completed.
Next day morning in period 'c' one more polishing can be completed. The total time is 22 hours.

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 48

Each of the five friends - A, B, C, D and E has bought one item among Charger, Headset, Earphones, Mouse and Multiplug, not necessarily in the same order, for his laptop through a website, which sells electronic products. The website sells each item at a discounted price. The original price of each item is among Rs. 2500, Rs. 1500, Rs. 900, Rs. 800 and Rs. 600, not necessarily in the same order. The selling price of each item is among Rs. 1250, Rs. 1100, Rs. 600, Rs. 500 and Rs. 300, not necessarily in the same order.

The following information is known about the original prices and selling prices of the products they bought.

(1) Earphones were sold at 50% discount.
(2) C bought the product at Rs. 500.
(3) The difference between the original prices of the products bought by D and C is equal to the selling price of Mouse.
(4) The difference between the original price and selling price of Multiplug is Rs. 400.
(5) E bought Mouse and B did not buy Earphones.
(6) The discounted price of no item is more than 50%.

If C bought Headset, then what is the discount percentage offered on Charger?

A) 26.67% B) 37.5% C) 44.44% ✓D) 50%

Explanation:-
From (6), we can say that the selling prices of the items whose original prices are 2500 and 600 must be 1250 and 300, respectively. From (1), the original price of Earphones must be either 2500 or 600.
Case (i): Let the original price of Earphones be Rs. 2500.
The selling price of Earphones must be 1250. Now combining (2) and (3), we can say that the original price of the item bought by C must be 900 and that of D must be 1500. The selling price of Mouse must be 600. As B did not buy Earphones, A must have bought Earphones. From (4), one among D and C must have bought Multiplug.
The final representation will be as follows.

Name	Item	Original Price	Selling Price
A	Earphones	2500	1250
D		1500	1100
C		900	500
E	Mouse	800	600
B		600	300

One among D and C must have bought Multiplug.
Case (ii): Let the original price of Earphones be 600.
The selling price of Earphones must be 300. Now combining (2) and (3), we can say that the original price of the item bought by C must be 900 and that of D must be 1500. The selling price of Mouse must be 600. As B did not buy Earphones, A must have bought

Earphones. From (4), one among D and C must have bought Multiplug.
The final representation will be as follows.

Name	Item	Original Price	Selling Price
B		2500	1250
D		1500	1100
C		900	500
E	Mouse	800	600
A	Earphones	600	300

One among D and C must have bought Multiplug.
If C bought Headset, D has to buy multiplug. Then B must have bought Charger. In both the cases, the discount price offered is 50%.

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 49

Each of the five friends - A, B, C, D and E has bought one item among Charger, Headset, Earphones, Mouse and Multiplug, not necessarily in the same order, for his laptop through a website, which sells electronic products. The website sells each item at a discounted price. The original price of each item is among Rs. 2500, Rs. 1500, Rs. 900, Rs. 800 and Rs. 600, not necessarily in the same order. The selling price of each item is among Rs. 1250, Rs. 1100, Rs. 600, Rs. 500 and Rs. 300, not necessarily in the same order.

The following information is known about the original prices and selling prices of the products they bought.

(1) Earphones were sold at 50% discount.
(2) C bought the product at Rs. 500.
(3) The difference between the original prices of the products bought by D and C is equal to the selling price of Mouse.
(4) The difference between the original price and selling price of Multiplug is Rs. 400.
(5) E bought Mouse and B did not buy Earphones.
(6) The discounted price of no item is more than 50%.

Who among them bought the good whose price is third lowest in terms of original price?

A) B B) E ✓C) C D) Cannot be determined

Explanation:-
From (6), we can say that the selling prices of the items whose original prices are 2500 and 600 must be 1250 and 300, respectively. From (1), the original price of Earphones must be either 2500 or 600.
Case (i): Let the original price of Earphones be Rs. 2500.
The selling price of Earphones must be 1250. Now combining (2) and (3), we can say that the original price of the item bought by C must be 900 and that of D must be 1500. The selling price of Mouse must be 600. As B did not buy Earphones, A must have bought Earphones. From (4), one among D and C must have bought Multiplug.
The final representation will be as follows.

Name	Item	Original Price	Selling Price
A	Earphones	2500	1250
D		1500	1100
C		900	500
E	Mouse	800	600
B		600	300

One among D and C must have bought Multiplug.
Case (ii): Let the original price of Earphones be 600.
The selling price of Earphones must be 300. Now combining (2) and (3), we can say that the original price of the item bought by C must be 900 and that of D must be 1500. The selling price of Mouse must be 600. As B did not buy Earphones, A must have bought Earphones. From (4), one among D and C must have bought Multiplug.
The final representation will be as follows.

Name	Item	Original Price	Selling Price
B		2500	1250
D		1500	1100
C		900	500
E	Mouse	800	600
A	Earphones	600	300

One among D and C must have bought Multiplug.
In both the cases, it is C who bought the item whose price is the third lowest price, in terms of original price.

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 50

Each of the five friends - A, B, C, D and E has bought one item among Charger, Headset, Earphones, Mouse and Multiplug, not necessarily in the same order, for his laptop through a website, which sells electronic products. The website sells each item at a discounted price. The original price of each item is among Rs. 2500, Rs. 1500, Rs. 900, Rs. 800 and Rs. 600, not necessarily in the same order. The selling price of each item is among Rs. 1250, Rs. 1100, Rs. 600, Rs. 500 and Rs. 300, not necessarily in the same order.

The following information is known about the original prices and selling prices of the products they bought.

(1) Earphones were sold at 50% discount.
(2) C bought the product at Rs. 500.
(3) The difference between the original prices of the products bought by D and C is equal to the selling price of Mouse.
(4) The difference between the original price and selling price of Multiplug is Rs. 400.
(5) E bought Mouse and B did not buy Earphones.
(6) The discounted price of no item is more than 50%.

Which good was sold at Rs. 600?

A) Multiplug B) Charger ✓C) Mouse D) Cannot be determined

Explanation:-
From (6), we can say that the selling prices of the items whose original prices are 2500 and 600 must be 1250 and 300, respectively. From (1), the original price of Earphones must be either 2500 or 600.
Case (i): Let the original price of Earphones be Rs. 2500.
The selling price of Earphones must be 1250. Now combining (2) and (3), we can say that the original price of the item bought by C must be 900 and that of D must be 1500. The selling price of Mouse must be 600. As B did not buy Earphones, A must have bought Earphones. From (4), one among D and C must have bought Multiplug.
The final representation will be as follows.

Name	Item	Original Price	Selling Price
A	Earphones	2500	1250
D		1500	1100
C		900	500
E	Mouse	800	600
B		600	300

One among D and C must have bought Multiplug.
Case (ii): Let the original price of Earphones be 600.
The selling price of Earphones must be 300. Now combining (2) and (3), we can say that the original price of the item bought by C must be 900 and that of D must be 1500. The selling price of Mouse must be 600. As B did not buy Earphones, A must have bought Earphones. From (4), one among D and C must have bought Multiplug.
The final representation will be as follows.

Name	Item	Original Price	Selling Price
B		2500	1250

D		1500	1100
C		900	500
E	Mouse	800	600
A	Earphones	600	300

One among D and C must have bought Multiplug.
Mouse was sold at Rs. 600.

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 51

THE PRICES OF GOODS AND SERVICES (IN $) IN FIVE EUROPEAN COUNTRIES

Goods/Services	Belgium	France	Germany	Italy	Spain
Coca Cola (1-5 litre)	2.05	1.05	1.89	1.65	1.14
Big Mac (Burger)	2.86	3.08	2.67	2.48	2.38
Levis 501 Jeans	71.00	83.00	81.00	69.00	70.00
Compaq Presario 2240 PC	1316.00	1348.00	917.00	1208.00	1267.00
Gasoline (1 litre)	0.93	1.03	0.87	0.94	0.73
Dry Cleaning (Shirt)	3.68	4.67	2.43	2.75	2.92
Merceedes car (1 day rental)	154.00	110.00	103.00	243.00	113.00
Volkswagen Golf GI	13553.00	16317.00	13999.00	17056.00	17356.00

If a German wants to buy all the goods/services listed in the table above and travel between any two countries, it costs $20. What is the lowest price at which he can procure all the goods?

A) $14565.56 B) $14546.43 C) $14151.86 ✓D) $14701.86

Explanation:-
The cost will be minimum for minimum value for purchase of Volkswagen Golf GI and Compaq Presario 2240 PC.
This is possible when the man buys Volkswagen Golf GI from Belgium and the remaining goods from Germany.
Thus, the total cost = $ (1.89 + 2.67 + 81.00 + 917.00 + 0.87 + 2.43 + 103.00 + 13553) = $14661.86. But a trip to Belgium to buy Volkswagan Golf costs him $(2 × 20). Hence, the lowest cost = $(14661.86 + 40) = $14701.86. Hence, [4].

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 52

THE PRICES OF GOODS AND SERVICES (IN $) IN FIVE EUROPEAN COUNTRIES

Goods/Services	Belgium	France	Germany	Italy	Spain
Coca Cola (1-5 litre)	2.05	1.05	1.89	1.65	1.14
Big Mac (Burger)	2.86	3.08	2.67	2.48	2.38
Levis 501 Jeans	71.00	83.00	81.00	69.00	70.00

Compaq Presario 2240 PC	1316.00	1348.00	917.00	1208.00	1267.00
Gasoline (1 litre)	0.93	1.03	0.87	0.94	0.73
Dry Cleaning (Shirt)	3.68	4.67	2.43	2.75	2.92
Merceedes car (1 day rental)	154.00	110.00	103.00	243.00	113.00
Volkswagen Golf GI	13553.00	16317.00	13999.00	17056.00	17356.00

If the Euro were introduced and the cost of a product is decided by averaging out the costs across these countries, how much would a Compaq Presario 2240 PC cost in Euro, if 1 Euro = 2 dollars?

✓A) 605.6 B) 1211.2 C) 842.1 D) 607.3

Explanation:-

$$\text{Average cost of Compaq Presario} = \frac{1316+1348+917+1208+1267}{5} = \$1211.2$$

$$\therefore \text{In Euros} = \frac{1211.2}{2} = \text{Euro } 605.6.$$

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 53

THE PRICES OF GOODS AND SERVICES (IN $) IN FIVE EUROPEAN COUNTRIES

Goods/Services	Belgium	France	Germany	Italy	Spain
Coca Cola (1-5 litre)	2.05	1.05	1.89	1.65	1.14
Big Mac (Burger)	2.86	3.08	2.67	2.48	2.38
Levis 501 Jeans	71.00	83.00	81.00	69.00	70.00
Compaq Presario 2240 PC	1316.00	1348.00	917.00	1208.00	1267.00
Gasoline (1 litre)	0.93	1.03	0.87	0.94	0.73
Dry Cleaning (Shirt)	3.68	4.67	2.43	2.75	2.92
Merceedes car (1 day rental)	154.00	110.00	103.00	243.00	113.00
Volkswagen Golf GI	13553.00	16317.00	13999.00	17056.00	17356.00

If a person buys all the goods and uses all the services listed, between which two countries *is* the absolute difference the most?

✓A) Belgium and Spain B) Spain and Germany C) Italy and Belgium D) None of these

Explanation:-

Calculating the prices for all the countries.

Belgium *$15103.52*
France *$17867.83*
Germany *$15107.86*
Italy *$18583.82*

Spain $18813.17
From above, it is clear that difference for the services goods is the largest for Belgium and Spain. Hence, [1].

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 54

THE PRICES OF GOODS AND SERVICES (IN $) IN FIVE EUROPEAN COUNTRIES

Goods/Services	Belgium	France	Germany	Italy	Spain
Coca Cola (1-5 litre)	2.05	1.05	1.89	1.65	1.14
Big Mac (Burger)	2.86	3.08	2.67	2.48	2.38
Levis 501 Jeans	71.00	83.00	81.00	69.00	70.00
Compaq Presario 2240 PC	1316.00	1348.00	917.00	1208.00	1267.00
Gasoline (1 litre)	0.93	1.03	0.87	0.94	0.73
Dry Cleaning (Shirt)	3.68	4.67	2.43	2.75	2.92
Merceedes car (1 day rental)	154.00	110.00	103.00	243.00	113.00
Volkswagen Golf GI	13553.00	16317.00	13999.00	17056.00	17356.00

How much, does a person spend if he makes a round trip covering all the 5 countries, using up 84 litres of gasoline in each country? Each country takes 1 day to cover and no country permits another country's car to enter.
(So, everytime a mercedes a used)

A) $727.5 ✓B) $1101 C) $988 D) $1255

Explanation:-
Cost = 1 day rental + Gasoline cost (in 5 countries) = 154 + 110 + 103 + 243 + 113 + 84 × (0.93 +1.03 + 0.87 + 0.94 + 0.73) = 723 + 84 × 4.5 = 1101.Hence. [2].

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 55

Participation in General Elections:
A person of age greater than 18 years is part of the voting age population.

Characteristics	**1999**		**1996**	
	Persons of voting age populations (in millions)	Percent voted	Persons of voting age populations (in millions)	Percent voted
Gender:				
Male	348	69	320	72
Female	312		280	71
People of different religions				

Hindus	514.8	57	450	75
Muslims	52.8	51	42	69
Christians	13.2	66	18	57
Others	79.2	56	90	

Approximately what per cent of 'Others' category did not vote during General Elections 1996?

A) 29% ✓B) 42% C) 53% D) Cannot be determined

Explanation:-

Let x be the per cent of 'Others' voted during 1996 elections.

$320\times\frac{72}{100}+280\times\frac{71}{100}=450\times\frac{75}{100}+42\times\frac{69}{100}+18\times\frac{57}{100}+90\times x\therefore x=\frac{52.46}{90}=58.28\%$

∴ Percentage of 'others' who did not vote = 100 – 58.28 ≅ 42%.

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 56

Participation in General Elections:
A person of age greater than 18 years is part of the voting age population.

Characteristics	**1999**		**1996**	
	Persons of voting age populations (in millions)	Percent voted	Persons of voting age populations (in millions)	Percent voted
Gender:				
Male	348	69	320	72
Female	312		280	71
People of different religions				
Hindus	514.8	57	450	75
Muslims	52.8	51	42	69
Christians	13.2	66	18	57
Others	79.2	56	90	

If 40% of Hindus who voted during 1996 election were females, then what percentage of females who voted are not Hindus?

A) 29% ✓B) 32% C) 34% D) 37%

Explanation:-

Number of Hindu females voted $=\frac{40}{100}\times450\times\frac{75}{100}=135\text{million}$

Total number of females voted $=\frac{71}{100}\times280=198.8\,\text{million}$

$\therefore\%$ of non-Hindu females among females who voted $=\frac{198.8-135}{198.8}\times100=\frac{63.8}{198.8}\times100\cong32\%.$

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 57

Participation in General Elections:
A person of age greater than 18 years is part of the voting age population.

Characteristics	**1999**	**1996**

	Persons of voting age populations (in millions)	Percent voted	Persons of voting age populations (in millions)	Percent voted
Gender:				
Male	348	69	320	72
Female	312		280	71
People of different religions				
Hindus	514.8	57	450	75
Muslims	52.8	51	42	69
Christians	13.2	66	18	57
Others	79.2	56	90	

What per cent of females of voting age population voted during General Elections 1999?

A) 36.1% ✓B) 42.7% C) 49.2% D) 59.2%

Explanation:-
Let the required percentage is x.
348 × 69 + 312 × x = 514.8 × 57 + 52.8 × 51 + 13.2 × 66 + 79.2 × 56
24012 + 312x = 29343.6 + 2692.8 + 871.2 + 4435.2
312x = 13330.8
x = 42.7%

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 58

Participation in General Elections:
A person of age greater than 18 years is part of the voting age population.

Characteristics	**1999**		**1996**	
	Persons of voting age populations (in millions)	Percent voted	Persons of voting age populations (in millions)	Percent voted
Gender:				
Male	348	69	320	72
Female	312		280	71
People of different religions				
Hindus	514.8	57	450	75
Muslims	52.8	51	42	69
Christians	13.2	66	18	57
Others	79.2	56	90	

What per cent of the non-voting Muslim population of voting age population is the voting Christian population of voting age population during General Elections 1999?

A) 20% ✓B) 33% C) 57% D) 80%

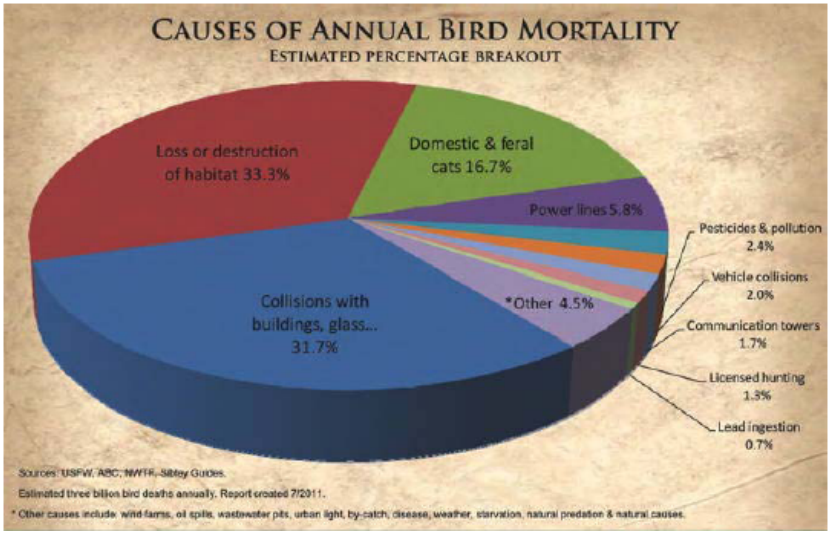
Explanation:-
Ratio of Muslim and Christian population of voting age is 4 : 1

$$\therefore \frac{\text{Voting Christian population of voting age}}{\text{Non}-\text{Voting Muslim population of voting age}} = \frac{66\times 13.2}{49\times 52.8} \cong \frac{1}{3} \text{ i.e. } 33\%$$

DIRECTIONS for the question: *Go through the pie chart/s given below and answer the question that follows.*

Question No. : 59

The total number of bird deaths is three billion annually.



As compared to the leading cause of mortality, how many fewer deaths are caused by domestic and feral cats?

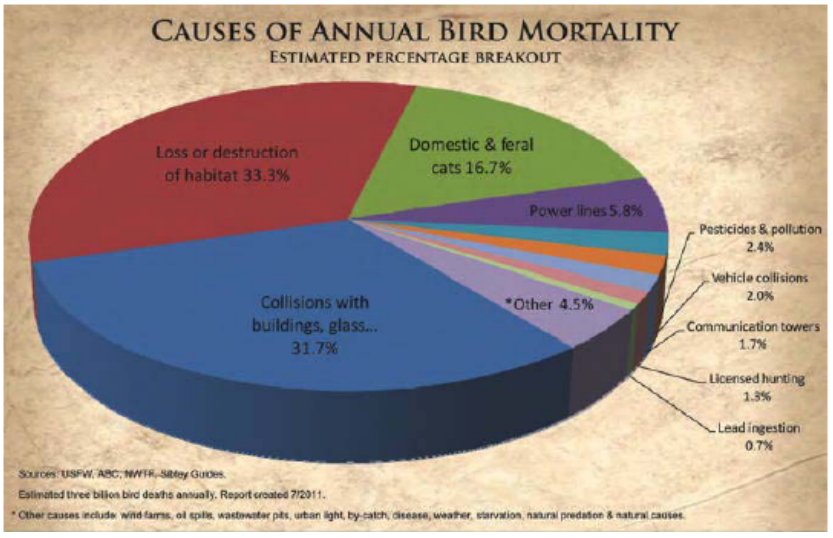
✓A) 0.5 billion B) 2500 million C) 50 million D) 0.25 billion

Explanation:-
= (33.3 – 16.7)/100 × 3 billion birds
= 0.5 billion birds
(There can be confusion between 33.3 and 31.7)

DIRECTIONS for the question: *Go through the pie chart/s given below and answer the question that follows.*

Question No. : 60

The total number of bird deaths is three billion annually.



How many birds, in millions, are killed by Licensed hunters every year? (in approximated numerical value)

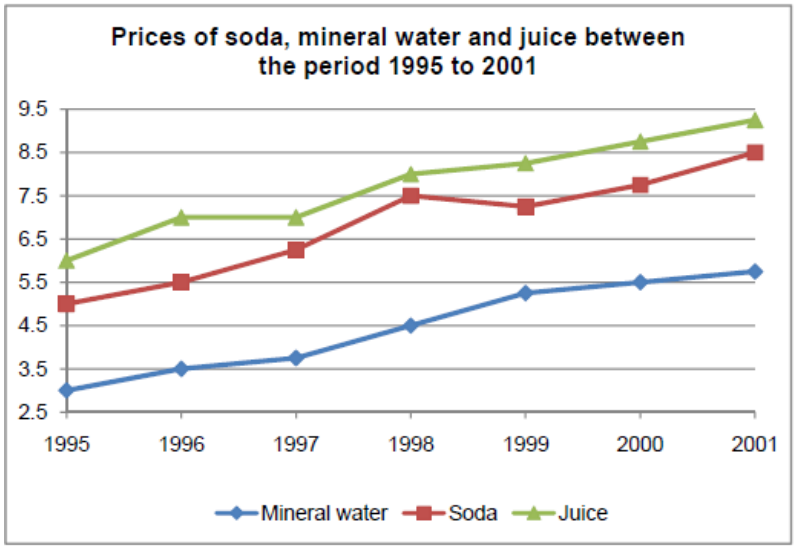
A) 39 B) C) D)

Explanation:-
= 1.3/100 × 3000 m = 39 million

DIRECTIONS for the question: *Analyse the graph/s given below and answer the question that follows.*

Question No. : 61

The question are based on the following graph showing the prices per can of mineral water and soda, and per 800 gm pack, price of juice. Assume that the volume of a can is 800 ml and the density of juice, defined as the weight in grams per ml, is 0.8.



Ignoring constant prices in successive years, the least increase in price per 800 ml of above mentioned drinks over any two successive years is:

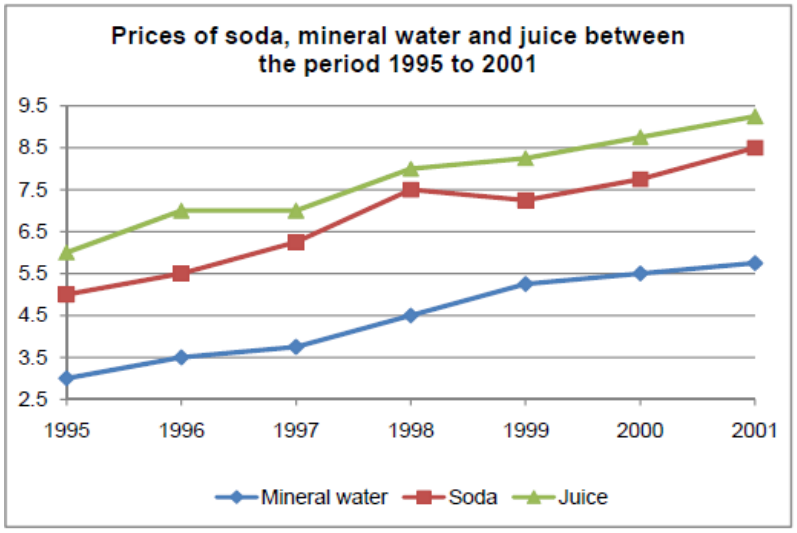
✓A) 20 paise B) 25 paise C) 40 paise D) 50 paise

Explanation:-
0.8 gm of juice = 1 ml
∴ 1 pack = 800 gm = 1000 ml.
∴ Price of 1 can of juice = $\frac{800}{1000}$ *× price of a pack = 0.8 × price of a pack*
Least increase for mineral water = 25 paise (in 1997) and least increase for soda = 50 paise.
Least increase for juice = 25paise per pack in 1999
∴ 0.8 × 25 = 20 paise increase per can. Hence, 1.

DIRECTIONS for the question: *Analyse the graph/s given below and answer the question that follows.*

Question No. : 62

The question are based on the following graph showing the prices per can of mineral water and soda, and per 800 gm pack, price of juice. Assume that the volume of a can is 800 ml and the density of juice, defined as the weight in grams per ml, is 0.8.



If the density of soda is 1.25 gm per ml, the difference between the prices of 800 gm each of soda and juice is the greatest in:

✓A) 1996 B) 1998 C) 2000 D) 2001

Explanation:-

1 ml of soda = 1.25 gm

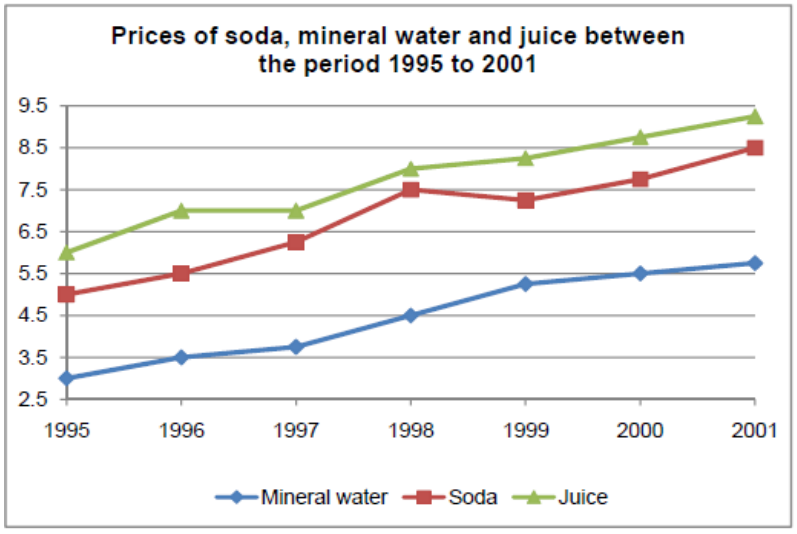
∴ 800ml = 1.25 × 800 = 1000 gm.

∴ Price of 800 gm of soda = 0.8 × Price of a can. The distance between the two price lines is maximum in 1996. Hence, 1.

DIRECTIONS for the question: *Analyse the graph/s given below and answer the question that follows.*

Question No. : 63

The question are based on the following graph showing the prices per can of mineral water and soda, and per 800 gm pack, price of juice. Assume that the volume of a can is 800 ml and the density of juice, defined as the weight in grams per ml, is 0.8.



Between 1997 and 2001 which product had the least percentage increase in price per can/pack?

A) Mineral water B) Soda ✓C) Juice D) More than 1 product

Explanation:-

Of Mineral water $\frac{5.75-3.75}{3.75}\times 100=\frac{2}{3.75}\times 100$

Of Soda $\frac{8.5-6.25}{6.25}\times 100=\frac{2.25}{6.25}\times 100$

Of Juice $\frac{9.25-7}{7}\times 100=\frac{2.25}{7}\times 100$

[Notice that percentage increase in price of a pack of a juice equals the percentage increase in the price of a can.]

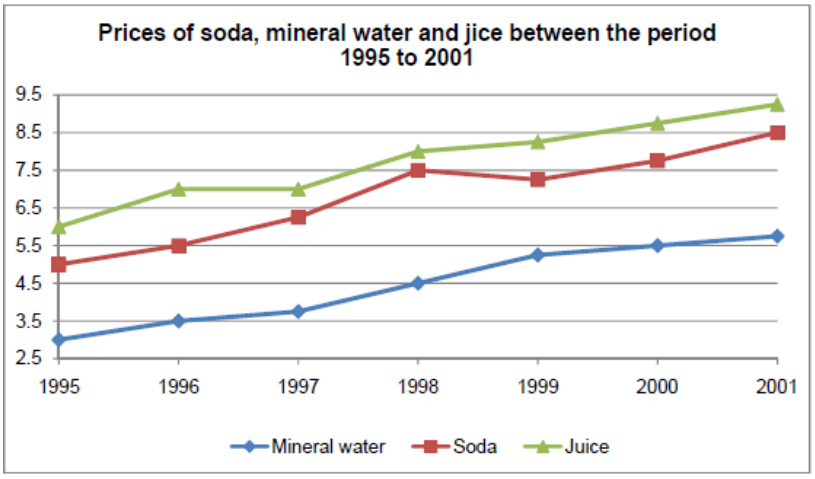
Obviously, $\frac{2.25}{7} \times 100$ is the least.

Alternatively,
The minimum difference between any two consecutive points is 25. But for juice, the dividing factor is highest. Hence, 3.

DIRECTIONS for the question: *Analyse the graph/s given below and answer the question that follows.*

Question No. : 64

The questions are based on the following graph showing the prices per can of mineral water and soda, and per 800 gm pack, price of juice. Assume that the volume of a can is 800 ml and the density of juice, defined as the weight in grams per ml, is 0.8.



The difference between the prices of mineral water and juice cans is the least in:

A) 1996 B) 1998 C) 2000 ✓D) 1995

Explanation:-
The difference in prices in a can of mineral water and juice is the least in the year in which the difference in the price of a pack of juice and the price of a can of mineral water is the least. Visually, the distance between the coordinates of the respective graphs is the least in 1995 and 1999 = Rs.3. But, 1999 is not there in the list of alternatives. Hence, [4].

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 65

"If at least one bird is a peacock, then some animals are tigers". Based on this statement, which of the following is definitely true?

A) If all birds are peacocks, then all animals are tigers B) If no bird is a peacock, then all animals are tigers
C) If all animals are tigers, then all birds are peacocks ✓D) If no animal is a tiger, then no bird is a peacock

Explanation:-
The given statement specifies that if even one bird is a peacock, then some animals must be tigers.
So, the fact that no animal is a tiger implies that no bird is a peacock.
Hence option 4.

DIRECTIONS for the question: *Read the information given below and answer the question that follows.*

Question No. : 66

Four car manufacturers, Audi, BMW, Mercedes and Volvo, have organized a rally in order to promote their latest car models in a particular city. Avantika was observing this rally in the main square of the city. The first car that she saw was a BMW, and it was followed by a car which was neither a Mercedes nor a Volvo. The third car was a Mercedes while the fourth car was the same as the second car. The fifth car was a Volvo and the sixth car was the same as the third car. Finally the seventh car was an Audi. Avantika found that she had seen x cars of a particular company. If $x = 3$, which of the following must be true?

A) *x* is the number of Mercedes cars B) *x* is the number of BMW cars C) *x* is the number of both Audi and BMW cars
✓D) *x* is the number of either Audi or BMW cars

Explanation:-
The 1st car was a BMW.
The 2nd car was either an Audi or a BMW.
The 3rd car was a Mercedes.
The 4th car was either an Audi or a BMW.
The 5th car was a Volvo.
The 6th car was a Mercedes.
The 7th car was an Audi.

So, Avantika could have seen either 3 Audis or 3 BMWs.
Hence option 4.

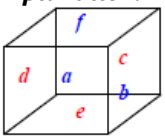
Section : Quantitative Ability

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 67

A natural number is written on each face of a cube so that the sum of the numbers on all the faces is *S*. A small triangular portion is sliced off from each corner of the cube. The product of the numbers on the faces that meet at a particular corner is written on the portion sliced off at that corner. The sum of the numbers written on all the sliced off portions is 2004. How many different values can *S* take? (in numerical value)

A) 4 B) C) D)

Explanation:-


Consider the cube as shown above. Suppose the natural numbers on the 6 faces are a, b, c, d, e and f. The blue font denotes numbers on the faces that are visible and the red font denotes numbers on the faces that are not visible. The products written on the 8 sliced off portions will be abe, abf, ade, adf, bce, bcf, cde and cdf. The sum of these products is abe + abf + ade + adf + bce + bcf + cde + cdf = 2004. We can simplify this expression as ab(e + f) + ad(e + f) + bc(e + f) + cd(e + f) = (e + f)(ab + ad + bc + cd) = (e + f)[a(b + d) + c(b + d)] = (a + c)(b + d)(e + f) = 2004. We can factorise 2004 = 2 × 2 × 3 × 167. Since each of the factors (a + c)(b + d)(e + f) is the sum of two natural numbers, we know that each of these factors must be greater than 1. Rearranging the factors, we get, (a + c)(b + d)(e + f) = (4 × 3 × 167) = (2 × 6 × 167) = (2 × 3 × 334) = (2 × 2 × 501). Based on these values, S = a + b + c + d + e + f = (4 + 3 + 167) = 174, or (2 + 6 + 167) = 175 or (2 + 3 + 334) = 339 or (2 + 2 + 501) = 505. Thus, S can take 4 different values.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 68

Find the remainder when 1! + 2! + 3!..... + 95! is divided by 15. (in numerical value)

A) 3 B) C) D)

Explanation:-
Each term after 4! is divisible by 15. So we need the remainder when 1! + 2! + 3! + 4! is divided by 15. The sum of these four terms is 1 + 2 + 6 + 24 = 33, which when divided by 15 leaves remainder 3.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 69

Ed and Sue bike at equal and constant rates. Similarly, they jog at equal and constant rates, and they swim at equal and constant rates. Ed covers 74 kilometers after biking for 2 hours, jogging for 3 hours, and swimming for 4 hours, while Sue covers 91 kilometers after jogging for 2 hours, swimming for 3 hours, and biking for 4 hours. Their biking, jogging, and swimming rates are all whole numbers of kilometers per hour. What is the sum of the squares of Ed's biking, jogging, and swimming rates? (in numerical value)

A) 314 B) C) D)

Explanation:-

Let b denote the biking rate of Ed and Sue, let j denote the jogging rate of Ed and Sue, and let s denote the swimming rate of Ed and Sue. Using Distance = Speed × time we have

$2b + 3j + 4s = 74$ and $4b + 2j + 3s = 91$..... (1)

We must compute $b^2 + j^2 + s^2$. The strategy is to eliminate one of the variables by using the two equations above. For instance, by doubling the first equation, we can solve for 4b in each equation and set the results equal to each other:

$148 – 6j – 8s = 4b = 91 – 2j – 3s$

Hence, $4j + 5s = 57$; (2)

Or $4j = 57 – 5s$: (3)

Equation (2) will clearly have a limited number of solutions in positive whole integers for j and s. Furthermore, in Equation (3), note that 57– 5s will be a positive multiple of 4 only if s = 1, 5, or 9. The corresponding values of j are 13, 8, or 3 respectively. For each pair (s, j), we can solve for b by using either equation in (1). The results are summarized in the table below:

s	j	b
1	13	15.5
5	8	15
9	3	14.5

Only the second option consists entirely of whole number values, so we conclude that s = 5, j = 8, and b = 15. The sum of the squares of these rates is $s^2 + j^2 + b^2 = 25 + 64 + 225 = 314$.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 70

N is a 2-digit integer such that N = 11x + 10, where x takes values 0, 1, 2, ..., 9. How many values can N take? (in numerical value)

A) 9 B) C) D)

Explanation:-

We can write N as 10(x + 1) + x. This means that the tens digit is x +1 and the units digit is x. So, the difference between the two is 1. So N can have 9 values, 10, 21, 32, …, 98

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 71

If α is one of the roots of $\frac{3}{x-3}+\frac{5}{x-5}+\frac{17}{x-17}+\frac{19}{x-19}=x^2-11x-4$, where 'x' is non zero, which of the following best describes the largest possible value of α?

A) $11+\sqrt{252}$ B) $52+\sqrt{200}$ ✓C) $11+\sqrt{52+\sqrt{200}}$ D) $7+\sqrt{52}+\sqrt{200}$

Explanation:-

The value of α is basically a value of x that satisfies the given expression.

$$\frac{3}{x-3}+\frac{5}{x-5}+\frac{17}{x-17}+\frac{19}{x-19}=x^2-11x-4$$

$$\frac{3}{x-3}+1+\frac{5}{x-5}+1+\frac{17}{x-17}+1+\frac{19}{x-19}+1=x^2-11x$$

$$\frac{x}{x-3}+\frac{x}{x-5}+\frac{x}{x-17}+\frac{x}{x-19}=x(x-11)$$

$$\frac{1}{x-3}+\frac{1}{x-5}+\frac{1}{x-17}+\frac{1}{x-19}=(x-11)$$

Putting x – 11 = y, we have

$$\frac{1}{y+8}+\frac{1}{y+6}+\frac{1}{y-6}+\frac{1}{y-8}=y$$

$$\frac{1}{y+8}+\frac{1}{y+6}+\frac{1}{y-6}+\frac{1}{y-8}=y$$

$$\frac{2y}{y^2-36}+\frac{2y}{y^2-64}=y$$

$$\frac{2}{y^2-36}+\frac{2}{y^2-64}=1$$

Putting $y^2 = z$ and solving for z, we get $z = 52 + \sqrt{200}$
Putting this value in y and the value of y in turn in x, we get
$x = 11 + \sqrt{(52 + \sqrt{200})}$

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 72

All the 7-digit numbers containing each of the digits 1, 2, 3, 4, 5, 6, 7 exactly once, and not divisible by 5, are arranged in the increasing order. Find the 2015^{th} number in this list.

A) 3657421 B) 4315672 C) 4317562 ✓D) 4512736

Explanation:-
It is given that the numbers are arranged in ascending order. So, let us first consider numbers starting with 1. If the first digit is fixed as 1, then the first thing that comes to mind is that the remaining 6 digits can be arranged in 6! = 720 ways and, therefore, there are 720 numbers starting with 1. However, we are interested in numbers that are not divisible by 5. So, if the first digit is fixed as 1 and the last digit can take any of the 5 values (2, 3, 4, 6, or 7), then the remaining 5 digits can be arranged in 5! = 120 ways. So, there are 5 × 120 = 600 such numbers. This logic will extend to numbers starting with 2, 3, 4, 5, 6 and 7. Now, 2015 = 600 × 3 + 215. This tells us that the 2015^{th} number must start with 4. Now, in ascending order, this group of numbers should start with 41 then 42 and so on. Consider numbers starting with 41. The last digit can be any one of 4 values (2, 3, 6 or 7) and the remaining 4 digits can be arranged in 4! = 24 ways. So, there are 4 × 24 = 96 such numbers. Similarly, there are 96 numbers that start with 42. Now, 215 – 96 – 96 = 23. Of these 23 numbers, the first few values will start with 4312, 4315, 4316 and so on. Consider numbers starting with 4312. The last 3 digits can be arranged in 6 ways; however, the 2 cases ending in 5 are not allowed. So, there are 4 such numbers. Consider numbers starting with 4315, where the last 3 digits can be arranged in 6 ways to yield 6 numbers. Consider numbers starting with 4316 and 4317, where the last 3 digits will yield 4 numbers each. This brings our count to 5 numbers remaining. These numbers will start with 4512 and the required number will be 4512736.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 73

The sum of six numbers in arithmetic progression is 3. If the first term is 4 times the third term, what is the value of the fifth term?

A) -17/2 ✓B) -4 C) 0 D) 1/2

Explanation:-
Suppose the 6 numbers in AP are a, (a + d), (a + 2d), (a + 3d), (a + 4d) and (a + 5d). From the given information, a = 4(a + 2d), which yields 3a + 8d = 0. The sum of the 6 numbers is 3(2a + 5d) = 3 ⇒ 6a + 15d = 3. Solving these simultaneously, we get a = 8 and d = –3. So the six numbers are 8, 5, 2, –1, –4, –7. Thus the fifth term is –4.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 74

If x and y are prime numbers such that $x^2 + 7xy + y^2$ is a perfect square, how many different values can (x, y) take?

A) 1 B) 3 C) 7 ✓D) infinitely many

Explanation:-

Suppose $x^2 + 7xy + y^2 = z^2$, for some positive integer z. With a little bit of manipulation, we can write $5xy = z^2 - (x + y)^2 = (z + x + y)(z - x - y)$.

Case 1: If $(z + x + y) = x$ or y, we would get $x = -z$ or $y = -z$. So this case is ruled out.

Case 2: If $(z + x + y) = 5$, then since x and y are prime numbers greater than or equal to 2, we would end up getting $z \le 1$, which is not possible.

Case 3: Consider $(z + x + y) = 5x$ and $(z - x - y) = y$. Subtracting the second expression from the first, we get $2(x + y) = 5x - y$, which gives us $3x = 3y$ or $x = y$. Thus, we see that there are infinitely many values of (x, y) that satisfy the given conditions as long as $x = y$.

Note: We can also consider $(z + x + y) = xy$, $(z - x - y) = 5$ which would yield $(x, y) = (3, 11)$ or $(11, 3)$. However, this does not matter as we have already have infinitely many solutions to (x, y).

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 75

If a, b and c are real numbers such that $a+\frac{1}{b}=b+\frac{1}{c}=c+\frac{1}{a}$, which of the following is a possible value of the product abc?

A) 0 ✓B) 1 C) 2 D) 8

Explanation:-

Since $a+\frac{1}{b}=b+\frac{1}{c}$, we have $a-b=\frac{1}{c}-\frac{1}{b}=\frac{b-c}{bc}$. Similarly, since $b+\frac{1}{c}=c+\frac{1}{a}$, we have $b-c=\frac{1}{a}-\frac{1}{c}=\frac{c-a}{ac}$ and since $c+\frac{1}{a}=a+\frac{1}{b}$, we have $c-a=\frac{1}{b}-\frac{1}{a}=\frac{a-b}{ab}$. Multiplying the three expressions, we get $(a-b)(b-c)(c-a)=(abc)^2(a-b)(b-c)(c-a)$, which gives us $(abc)^2 = 1$ or $abc = \pm 1$.

The best answer is option 2.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 76

If 2100! = $(504)^p \times q$, where q is not the multiple of 7, what is the smallest value of p? (in numerical value)

A) 348 B) C) D)

Explanation:-

2100! = $(7^p \times 3^{2p} \times 2^{3p}) \times q$. Since q is not a multiple of 7, we can find the value of p by calculating the maximum power of 7 that divides 2100!. Using successive division by 7, the quotients are 300, 42 and 6. Thus p = 348.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 77

If all the roots of $x^4 - 2ax^2 + x + a^2 - a = 0$ are real, which of the following is true of a? (Write the answer option)

1. $a \le -4/3$ 2. $a \ge -3$ 3. $a \ge 0$ 4. $a \ge 3/4$

A) 4 B) C) D)

Explanation:-

If we rewrite the given expression as $x^4 - 2ax^2 + x + a^2 - a + x^3 - x^3 + x^2 - x^2 + ax - ax = 0$, we can factorise it as $(x^2 + x - a)(x^2 - x + 1 - a) = 0$.

If $(x^2 + x - a) = 0$, then the roots are $x = \frac{-1 \pm \sqrt{1+4a}}{2}$, and if $(x^2 - x + 1 - a) = 0$, then the roots are $\frac{1 \pm \sqrt{4a-3}}{2}$.

Since it is given that all roots of the expression are real, in the first case, we have $\sqrt{1+4a} \geq 0$, which gives $1 \geq -4a$ or $a \geq -1/4$ and in the second case we have $\sqrt{4a-3} \geq 0$, which gives $4a \geq 3$ or $a \geq 3/4$. Combining both, we can conclude that the given expression will have all real roots if $a \geq 3/4$. Hence option 4.

DIRECTIONS for the question: *Answer the question independently of any other question.*

Question No. : 78

There are 3 weights in the forms of discs with diameters 3 cm, 4 cm and 5 cm. When placed on one side of a weighing balance, they equally balance a fourth weight on the other side of the weighing balance. If the thicknesses and densities of all discs are the same, then what is the diameter of the fourth disc?

✓A) $5\sqrt{2}$ cm B) 6 cm C) $10\sqrt{2}$ cm D) $5\sqrt{3}$ cm

Explanation:-

Since 3 discs balance the 4^{th}, the volume of the 3 discs equals the volume of the 4^{th}. As the thickness of each of the discs is the same, the volumes will depend only on the squares of the radii. If the radius of the 4th disc is R, then $R^2 = (3/2)^2 + (4/2)^2 + (5/2)^2 = 50/4 \Rightarrow R = 5\sqrt{2} / 2$. So the diameter of the 4th disc is $5\sqrt{2}$cm.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 79

Consider positive integers x and y such that the difference between $x^2 + y$ and $x + y^2$ is a prime number. How many different values can the ordered pair (x, y) take?

A) 1 ✓B) 2 C) 5 D) infinitely many

Explanation:-

Suppose $x^2 + y > x + y^2$. Let the difference between them be a prime number z so that $z = (x^2 + y) - (x + y^2) = (x - y)(x + y - 1)$. Since $(x - y) < (x + y - 1)$, we get $(x - y) = 1$ and $(x + y - 1) = z$. Adding these two expressions, we get $z + 1 = 2x - 1 \Rightarrow x = (z/2) + 1$. Since we know that x is an integer, we can conclude that $(z/2)$ is an integer. In other words, $z = 2$, the only even prime number. This works when (x, y) could be (1, 2) or (2, 1). Thus, (x, y) can take 2 values.

Alternate solution: If both x and y are odd, then both expressions are even and their difference will be even. If both x and y are even, then both expressions are even and their difference is even. If one of x and y is odd and the other is even, then both expressions are odd and their difference is even. In all cases, the difference between the two expressions is even. Since this difference is a prime number, the only possibility is 2 (the only even prime number). With a little bit of trial and error, we can easily determine, that (x, y) could be (1, 2) or (2, 1). Thus, there are 2 values.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 80

A swimming pool has dimensions 10 m × 26 m. At the deep end of the pool, the depth is 4.4 m and it uniformly decreases till the shallow end with a depth of 1.6 m What is volume of the pool (in m^3)? (in numerical value)

A) 780 B) C) D)

Explanation:-

The sloping bottom of the pool will form a trapezium with parallel sides 4.4 and 1.6 and height as the length of the pool = 26. The area of this trapezium is ½ (4.4 + 1.6) × 26 = 78. So the volume of the pool will be 78 × 10 = 780 m^3.

Alternate solution: Since the depth is uniform, the average depth = (1.6 + 4.4) / 2 = 3 m. Hence volume = 10 × 26 × 3 = 780 m^3.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 81

If a is real number such that $(a^2 + a - 2)^3 + (2a^2 - a - 1)^3 = 27(a^2 - 1)^3$, which of the following cannot be the value of $3a^2 + 5a - 10$?

A) - 47/4 B) - 8 C) - 2 ✓D) 12

Explanation:-

Suppose $x = a^2 + a - 2$ and $y = 2a^2 - a - 1$. Adding the two expressions yields $(x + y) = a^2 + a - 2 + 2a^2 - a - 1 = 3a^2 - 3 = 3(a^2 - 1)$. We can now rewrite the original expression as $x^3 + y^3 = (x + y)^3$. In other words, $x^3 + y^3 = x^3 + y^3 + 3xy(x + y)$. Simplifying this expression, we get $xy(x + y) = 0$. This tells us that $x = 0$ or $y = 0$ or $(x + y) = 0$. If $x = 0$, then $a^2 + a - 2 = (a + 2)(a - 1) = 0$ which yields $a = -2$ or 1. If $y = 0$, then $2a^2 - a - 1 = (2a + 1)(a - 1) = 0$, which yields $a = -1/2$ or 1. If $(x + y) = 0$, then $3(a^2 - 1) = 3(a + 1)(a - 1) = 0$, which yields $a = -1$ or 1. So, we see that a can take values -2, -1, $-1/2$ or 1. Thus, $3a^2 + 5a - 10$ can take values -8, -12, $-47/4$ and -2 respectively. Hence option 4.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 82

The area of a rhombus is 30 and the ratio of the lengths of the diagonals is 4 : 5. What is area of square whose side is the same as that of the longer diagonal of the rhombus?

A) 48 ✓B) 75 C) 192 D) 300

Explanation:-

Since the area of the rhombus is 30, we know that half the product of diagonals is 30. So, the product of the diagonals is $4x \times 5x = 60$, which yields $5x = 5\sqrt{3}$. The area of the square with side $5\sqrt{3}$ is 75.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 83

Consider the series $\frac{1}{x^2+1}+\frac{2}{x^2+2}+\frac{3}{x^2+3}+\ldots+\frac{x}{x^2+x}$, where x is a natural number greater than 1. Which of the following best describes S? (Write the correct option)

1. $0 < S < 1$ 2. $0 < S < 1/x$ 3. $\frac{1}{2}<S<\frac{x+1}{2x}$ 4. $\frac{1}{x}<S<\frac{1}{x^2}$

A) 3 B) C) D)

Explanation:-

We know that $x^2 < x^2 + 1 < x^2 + 2 < x^2 + 3 < \ldots < x^2 + x$. We also know that if two fractions have the same numerator, then the fraction with the lower denominator has a higher value. Using these two pieces of information, we get $\frac{1}{x^2+1}+\frac{2}{x^2+2}+\ldots+\frac{x}{x^2+x}>\frac{1}{x^2+x}+\frac{2}{x^2+x}+\ldots+\frac{x}{x^2+x}$. *The right hand side of this* expression can be written as $\frac{1}{x^2+x}(1+2+\ldots+x)=\frac{x(x+1)}{2(x^2+x)}=\frac{x(x+1)}{2x(x+1)}=\frac{1}{2}$. So, the sum of the series $S>\frac{1}{2}$. Following a similar logic, $\frac{1}{x^2+1}+\frac{2}{x^2+2}+\ldots+\frac{x}{x^2+x}<\frac{1}{x^2}+\frac{2}{x^2}+\ldots+\frac{x}{x^2}$. The right hand side of this expression can be written as $\frac{1}{x^2}(1+2+\ldots+x)=\frac{x(x+1)}{2x^2}=\frac{(x+1)}{2x}$. So, the sum of the series $S<\frac{(x+1)}{2x}$. Combining both results, we can conclude that $\frac{1}{2}<S<\frac{x+1}{2x}$.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 84

The greatest integer function, [x], is defined as the greatest integer not exceeding x. For $n > 7$, which of the following will always divide ${}^{n}C_{7} - \left[\frac{n}{7}\right]$? (write the correct option)

1. 5 2. 7 3. 10 4. 13

A) 2 B) C) D)

Explanation:-

Suppose n = 8. Then ${}^{8}C_{7} - [8/7] = 8 - [1.14] = 8 - 1 = 7$.

Suppose n = 9. Then ${}^{9}C_{7} - [9/7] = 36 - [1.28] = 36 - 1 = 35$.

Suppose n = 10. Then ${}^{10}C_{7} - [10/7] = 120 - [1.42] = 120 - 1 = 119$.

Suppose n = 11. Then ${}^{11}C_{7} - [11/7] = 329$

Suppose n = 12. Then ${}^{12}C_{7} - [12/7] = 792 - [1.71] = 792 - 1 = 791$.

Since 7 is a common factor of each of the answers, we can conclude that the expression is always divisible by 7.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 85

Given that a, b, and c are positive integers, solve the equation $a!b! = a! + b! + 2^{c}$. What is the value of $(a + b + c)^{4}$?

A) 1296 ✓B) 2401 C) 3164 D) 4096

Explanation:-

Without loss of generality let us assume that $a \geq b$ and divide through by b!, so that,

$a! = a!/b! + 1 + 2^{c}/b!$, giving integers throughout.

As each term on the RHS is integer, RHS $\geq 3 \Rightarrow a! \geq 3 \Rightarrow a \geq 3$.

For b> 2, b! will contain a factor of 3, and so cannot divide 2^{c}. Thus b=1 or b=2.

If b = 1, we get $a! = a! + 1 + 2^{c}$, which leads to $2^{c} + 1 = 0$: no solution.

If b = 2, we get $a! = a!/2 + 1 + 2^{c-1}$, which leads to $a!/2 = 1 + 2^{c-1}$.

If a > 3, a!/2 is even, so $2^{c-1} = 1$. But then we get a!/2 = 2: no solution.

If a = 3, $3 = 1 + 2^{c-1} \Rightarrow c = 2$.

So, a = 3, b = 2 and c = 2.

Thus, $(a + b + c)^{4} = 2401$.

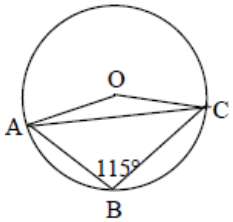
DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 86

In a circle with centre O; A, B and C are points on circumference such that ∠ABC = 115°. What is measure of ∠ACO in degree? (in numercial value)

A) 25 B) C) D)

Explanation:-



Consider the figure above. Since ∠ABC = 115°, the major arc AC = 230° and therefore, the minor arc AC = 130°. So, the central angle of the minor arc AC, i.e., ∠AOC = 130°. Now, ΔOAC is an isosceles triangle as OA and OC are both radii of the same circle. Thus, ∠ACO = ½ (180 – 130) = ½ × 50 = 25°

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 87

Consider the set X = {1, 2, 3, ..., 9, 10}. A and B are two non-empty disjoint subsets of X such that A ∪ B = X. The products of all the elements in A and B are represented by *prod*(A) and *prod*(B) respectively. If *prod*(A) is a multiple of *prod*(B), and quotient is the smallest possible integer, then what is the difference between the sum of all elements in A and the sum of all elements in B? (in numerical value)

A) 1 B) C) D)

Explanation:-
The prime factors of the numbers in set {1, 2, 3, ..., 9, 10} are 2, 3, 5 and 7. Now, 7 is the only number in X which has a prime factor 7 and therefore, it cannot appear in B (otherwise the 7 in the denominator would not get canceled). So, 7 must be in A. From this, we now know that prod(A) / prod(B) ≥ 7.

The numbers having prime factor 3 are 3, 6 and 9. Since we want the quotient to be as small as possible, 3 and 6 are in A and 9 is in B. Similarly, since 5 divides 5 and 10, 5 is in A and 10 is in B. Extending this logic, we can take 1, 2 and 4 in A and 8 in B. So, the two sets are A = {1, 2, 3, 4, 5, 6, 7} and B = {8, 9, 10} so that prod(A) = 7! = 5040 and prod(B) = 720 so that prod(A) / prod(B) is a minimum of 7. The sum of the elements in A is 28 and the sum of the elements in B is 27. Thus the requried difference is 1.

Note: the 1 can also be moved to set B in which case sum of elements in A is 27 and the sum of elements in B is 28. The difference would still be 1.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 88

What is the sum of the reciprocals of triangle numbers? A triangle number is a number which can be represented by an equilateral triangle; e.g., 3 is a triangle number as it can be represented by an equilateral triangle with 2 dots in the bottom row and 1 dot above this row.

✓A) 2 B) 3 C) 5 D) 7

Explanation:-
Series of reciprocals of triangle numbers: 1/1 + 1/3 + 1/6 + 1/10 + 1/15 + ...
Let S = 1/1 + 1/3 + 1/6 + 1/10 + ...
S/2 = 1/2 + 1/6 + 1/12 + 1/20 + ...
= 1/(1 × 2) + 1/(2 × 3) + 1/(3 × 4) + ... + 1/{n(n + 1)} + ...
But 1/{n(n + 1)} = (n + 1 – n)/{n(n + 1)}
= (n + 1)/{n(n + 1)} – n/{n(n + 1)}
= (1/n) – 1/(n + 1)
Therefore S/2 = (1/1 – 1/2) + (1/2 – 1/3) + (1/3 – 1/4) + ... = 1.
Hence S = 1/1 + 1/3 + 1/6 + ... = 2

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 89

Rahul alone can complete a piece of work in 90 days, while Anurag and Ketan can individually complete the same work in 40 days and 12 days respectively. Rahul works alone on the first day, Anurag works alone on the second day, Ketan works alone on the third day and they continue in the same sequence till the work is completed. If they are paid Rs. 100,000 for the job, in what ratio should they share the money respectively?

A) 4 : 9 : 30 B) 1: 2 : 7 ✓C) 4 : 9 : 27 D) 45 : 20 : 6

Explanation:-
Suppose the work is 360 units. Then, Rahul, Anurag and Ketan can complete 4 units, 9 units and 30 units per day respectively. Since they work one by one, they would complete a total of 43 units of work every 3 days. Now, 43 × 8 = 344 units of work are completed in 24 days. On the 25^{th} day, Rahul will complete another 4 units of work, on the 26^{th} day, Anurag will complete another 9 units of work and on the 27^{th} day, Ketan will complete the remaining 3 units of work. So, Rahul completes a total of 4 × 9 = 36 units of work, Anurag completes a total of 9 × 9 = 81 units of work and Ketan completes a total of (30 × 8) + 3 = 243 units of work. Since the ratio of the work done is 4 : 9 : 27, they should divide the money in the same ratio. Hence option 3.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 90

15^{th} Aug 2014 is Friday. What will be the day on 15^{th} Aug 2010?

✓A) Sunday B) Monday C) Thursday D) Saturday

Explanation:-
In any normal year, 15^{th} August will be a day ahead of the previous year on account of the 1 odd day, and in a leap year it will be 2 days ahead of the previous year on account of the 2 odd days. Working backwards, 15^{th} August 2013 was a Thursday, 15^{th} August 2012 was a Wednesday, 15^{th} August 2011 was a Monday and 15^{th} August 2010 was a Sunday.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 91

Arnav starts cycling from Pune to Satara at a speed of 8 kmph at the same time as Pranav starts from Pune to Satara at a speed of 13 kmph. After 4 hours, Arnav doubles his speed while Pranav reduces his speed by 1 kmph so that they reach Satara at the same time. What is the distance between Pune and Satara?

A) 68 km B) 94 km C) 104 km ✓D) 112 km

Explanation:-
Every hour, Pranav travels 5 km more than Arnav. At the end of 4 hours, Pranav is 20 km ahead of Arnav. Now, Arnav and Pranav are travelling at speeds of 16 kmph and 12 kmph respectively so that every hour, Arnav travels 4 km more than Pranav. Since Arnav will now take 20/4 = 5 hours to bridge the gap of 20 km, they will both reach Satara after 9 hours. Thus the distance between Pune and Satara is (4 × 8) + (5 × 16) = 112 km.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 92

A person gives 40% discount and still makes a profit of 20%. If he gives a discount of 25% only, what is his profit percentage? (in numerical value)

A) 50 B) C) D)

Explanation:-
Suppose MP = 100. Then SP = 60 and he makes a profit of 20%. So, CP = 50.. After giving a discount of 25%, SP = 75. So the profit earned will be 75 – 50 = 25, which is 50% of CP.
Alternate solution: Suppose CP = 100 so that SP = 120. This SP is 60% of the marked price. This means MP = 200. If he gives a discount of 25%, then SP = 150, which leads to a 50% profit on the CP of 100.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 93

A jar contains *n* black and *n* white balls. Each of *n* blindfolded people draws two balls at random from the jar without replacement. What is the probability that each of the *n* people draws two balls of different colours?

A) $\frac{2(n!)}{(2n)!}$ ✓B) $\frac{2^n(n!)^2}{(2n)!}$ C) $\frac{2^n(n!)}{(2n)!}$ D) $\frac{(n!)^2}{(2n)!}$

Explanation:-
Since there are n black and n white balls, the total number of balls in the jar is 2n.

For the first person, the probability of drawing a black ball and then a white ball is $\frac{n}{2n}\times\frac{n}{(2n-1)}$. However, the two balls drawn could also be a white and then a black. So the probability that the first person draws two balls of different colours is $\frac{2n^2}{2n(2n-1)}$.

For the second person, the probability of drawing a black ball and then a white ball is $\frac{(n-1)}{(2n-2)}\times\frac{(n-1)}{(2n-3)}$. However, the two balls drawn could also be a white and then a black. So the probability that the second person draws two balls of different colours is $\frac{2(n-1)^2}{(2n-2)(2n-3)}$.

For the third person, the probability of drawing a black ball and then a white ball is $\frac{(n-2)}{(2n-4)}\times\frac{(n-2)}{(2n-5)}$. However, the two balls drawn could also be a white and then a black. So the probability that the second person draws two balls of different colours is $\frac{2(n-2)^2}{(2n-4)(2n-5)}$.

We can now extend the same logic for the remaining people. Thus, the required probability is $\frac{2n^2}{2n(2n-1)}\times\frac{2(n-1)^2}{(2n-2)(2n-3)}\times\frac{2(n-2)^2}{(2n-4)(2n-5)}\times\ldots=\frac{2^n(n!)^2}{(2n)!}$.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 94

A and B alone can each complete a task in 4 hours and 3 hours respectively. With C's help, they can together complete the task in an hour. How long will C alone take to complete the task?

A) 2 hrs 40 min B) 2 hrs 36 min ✓C) 2 hrs 24 min D) 2 hrs 30 min

Explanation:-
Suppose the task is 12 units. Since A and B alone can each complete the task in 4 hours and 3 hours respectively, they must complete 3 units and 4 units each hour respectively. With C's help, they can together complete the task in 1 hour. So, together, they must complete 12 units in an hour. Of these 12 units, C must therefore, complete 12 – 3 – 4 = 5 units in 1 hour. Thus C alone can complete the task in 12/5 = 2.4 hours or 2 hours and 24 minutes.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 95

n is a positive integer such that $x = n^4 + (n + 1)^4$ is composite. What is the smallest possible value of *x*? (in numerical value)

A) B) C) D)

Explanation:-
Start by substituting values for n. If n = 1, then $x = 1^4 + 2^4 = 17$, if n = 2, then $x = 2^4 + 3^4 = 97$, if n = 3, then $x = 3^4 + 4^4 = 337$, if n = 4, then $x = 4^4 + 5^4 = 881$, if n = 5, then $x = 5^4 + 6^4 = 1921 = 17 \times 113$, and so on. It is clear that x is prime for n = 1, 2, 3 and 4 and is composite when n = 5. Thus, the smallest possible value of x is 1921.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 96

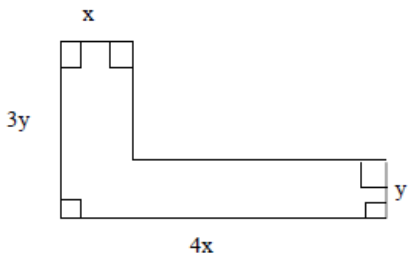
Hospital has a staff of 500 made up of nurses and cleaning staff. The average daily wage of these 500 employees is Rs. 300. The average daily wage of the 300 nurses was Rs. 50 more than that of the cleaning staff. What was the average daily wage of the nurses (in Rs.)? (write only the numerical value)

A) B) C) D)

Explanation:-
Let the daily wage of nurses be Rs. x. So, (500 × 300) = 300x + 200 (x – 50). Thus, 150000 = 500x – 10000 or 160000 = 500x, which yields x = Rs. 320.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 97



What is the area of the figure if the perimeter is 48 units? (write the answer option)

1. $8x - 4x^2$ 2. $4x - 4x^2$ 3. $48x - 8x^2$ 4. $8x - 48x^2$

A) 3 B) C) D)

Explanation:-
Area of the figure = Area of the rectangle formed by the sides 4x and 3y – Area of the rectangle formed by the sides 3x and 2y = 12 xy – 6xy = 6xy. The perimeter of the figure = 8x + 6y = 48, which gives 6y = (48 – 8x). Thus the area of the figure is 6xy = x(48 – 8x) = 48x – $8x^2$.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 98

If angles of a triangle are in the ratio of 1:2:3 then what is the ratio of its sides?

A) 1 : √2 : 2 B) 1 : √2 : 3 ✓C) 1 : √3 : 2 D) 2 : √3 : 4

Explanation:-
If the angles in a triangle are in the ratio 1:2:3, it is obviously a 30°–60°–90° triangle and the ratio of sides will be 1 : √3 : 2.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 99

In how many ways can 4 boys and 2 girls be arranged in a row so that no two girls sit together?

A) 48 B) 720 C) 240 ✓D) 480

Explanation:-
The 4 boys can be arranged in 4! = 24 different ways. There are now 5 slots in which we can arrange the 2 girls in 5 - 4 = 20 ways. Thus the total number of arrangements is 24 × 20 = 480.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 100

The population of a bacteria culture increases by 10% per hour for the first two hours and then decreases by 10% per hour for the next one hour. After that, the population increases by 5% per hour for the next two hours. If the initial population of the culture was 400,000, what will be the population at the end of 5 hours?

A) 576,000 B) 527,076 C) 518,400 ✓D) 480,249

Explanation:-
1^{st} hour: Population increases by 40,000 to become 400,000 + 40,000 = 440,000.

2nd hour: Population increases by 44,000 to become 440,000 + 44,000 = 484,000.
3rd hour: Population decreases by 48,400 to become 484,000 – 48,400 = 435,600.
4th hour: Population increases by 21,780 to become 435,600 + 21,780 = 457,380.
5th hour: Population increases by 22,869 to become 457,380 + 22,869 = 480,249.