CAT Scan – VA (2017) – 1

In the next few posts I will examine a few questions from CAT 2017 (Slot 1). I will start with a few questions from the Verbal Section (as several people have asked for Verbal related posts) and will hopefully follow that up with a couple of the DI sets and a selection from the QA section. If you have not already attempted the paper, my advice would be to try the questions for yourself first, and then only read these posts! So I will first post the questions, and then offer my solutions below to avoid spoilers.

In this post I will look at the three Summary questions:

The passage given below is followed by four summaries. Choose the option that best captures the author's position.

Q 1. To me, a "classic" means precisely the opposite of what my predecessors understood: a work is classical by reason of its resistance to contemporaneity and supposed universality, by reason of its capacity to indicate human particularity and difference in that past epoch. The classic is not what tells me about shared humanity-or, more truthfully put, what lets me recognize myself as already present in the past, what nourishes in me the illusion that everything has been like me and has existed only to prepare the way for me. Instead, the classic is what gives access to radically different forms of human consciousness for any given generation of readers, and thereby expands for them the range of possibilities of what it means to be a human being.

a) A classic is able to focus on the contemporary human condition and a unified experience of human consciousness.

b) A classical work seeks to resist particularity and temporal difference even as it focuses on a common humanity.

c) A classic is a work exploring the new, going beyond the universal, the contemporary, and the notion of a unified human consciousness.

d) A classic is a work that provides access to a universal experience of the human race as opposed to radically different forms of human consciousness.

Q 2. A translator of literary works needs a secure hold upon the two languages involved, supported by a good measure of familiarity with the two cultures. For an Indian translating works in an Indian language into English, finding satisfactory equivalents in a generalized western culture of practices and symbols in the original would be less difficult than gaining fluent control of contemporary English. When a westerner works on texts in Indian languages the interpretation of cultural elements will be the major challenge, rather than control over the grammar and essential vocabulary of the language concerned. It is much easier to remedy lapses in language in a text translated into English, than flaws of content. Since it is easier for an Indian to learn the English language than it is for a Briton or American to comprehend Indian culture, translations of Indian texts is better left to Indians.

a) While translating, the Indian and the westerner face the same challenges but they have different skill profiles and the former has the advantage.

b) As preserving cultural meanings is the essence of literary translation Indians' knowledge of the local culture outweighs the initial disadvantage of lower fluency in English.

c) Indian translators should translate Indian texts into English as their work is less likely to pose cultural problems which are harder to address than the quality of language.

d) Westerners might be good at gaining reasonable fluency in new languages, but as understanding the culture reflected in literature is crucial, Indians remain better placed.

Q 3. For each of the past three years, temperatures have hit peaks not seen since the birth of meteorology, and probably not for more than 110,000 years. The amount of carbon dioxide in the air is at its highest level in 4 million years. This does not cause storms like Harvey - there have always been storms and hurricanes along the Gulf of Mexico - but it makes them wetter and more powerful. As the seas warm, they evaporate more easily and provide energy to storm fronts. As the air above them warms, it holds more water vapour. For every half a degree Celsius in warming, there is about a 3% increase in atmospheric moisture content. Scientists call this the Clausius-Clapeyron equation. This means the skies fill more quickly and have more to dump. The storm surge was greater because sea levels have risen 20 cm as a result of more than 100 years of human-related global warming which has melted glaciers and thermally expanded the volume of seawater.

a) The storm Harvey is one of the regular, annual ones from the Gulf of Mexico; global warming and Harvey are unrelated phenomena.

b) Global warming does not breed storms but makes them more destructive; the Clausius-Clapeyron equation, though it predicts potential increase in atmospheric moisture content, cannot predict the scale of damage storms might wreck.

c) Global warming melts glaciers, resulting in seawater volume expansion; this enables more water vapour to fill the air above faster. Thus, modern storms contain more destructive energy.

d) It is naive to think that rising sea levels and the force of tropical storms are unrelated; Harvey was destructive as global warming has armed it with more moisture content, but this may not be true of all storms.

Solutions:

Opinion of predecessors

Q 1. To me, a "classic" means precisely the opposite of what my predecessors understood: a work is classical by reason of its resistance to contemporaneity and supposed universality, by reason of its capacity to indicate human particularity and difference in that past epoch. The classic is not what tells me about shared humanity-or, more truthfully put, what lets me recognize myself as already present in the past, what nourishes in me the illusion that everything has been like me and has existed only to prepare the way for me. Instead, the classic is what gives access to radically different forms of human consciousness for any given generation of readers, and thereby expands for them the range of possibilities of what it means to be a human being.

Opinion of author

a) A classic **is able to focus on** the contemporary human condition and **a unified experience of human consciousness.** ← *Contradiction*

b) A classical work seeks to resist particularity and temporal difference even as it **focuses on a common humanity.** ← *Contradiction*

c) A classic is a work exploring the new, going beyond the universal, the contemporary, and the notion of a unified human consciousness.

d) A classic is a work that **provides access to a universal experience** of the human race **as opposed to radically different forms of human consciousness.** ← *Contradiction*

Hence (c)

Q 2. A translator of literary works needs a secure hold upon the two languages involved, supported by a good measure of familiarity with the two cultures. For an Indian translating works in an Indian language into English, finding satisfactory equivalents in a generalized western culture of practices and symbols in the original would be less difficult than gaining fluent control of contemporary English. When a westerner works on texts in Indian languages the interpretation of cultural elements will be the major challenge, rather than control over the grammar and essential vocabulary of the language concerned. It is much easier to remedy lapses in language in a text translated into English, than flaws of content. Since it is easier for an Indian to learn the English language than it is for a Briton or American to comprehend Indian culture, translations of Indian texts is better left to Indians.

a) **While translating,** the Indian and the westerner face the same challenges but they have different skill profiles and the former has the advantage.

Not translation in general; translating Indian texts into English

b) As preserving cultural meanings is **the essence of literary translation** Indians' knowledge of the local culture outweighs the initial disadvantage of lower fluency in English.

Not translation in general; translating Indian texts into English

c) Indian translators **should translate Indian texts into English** as their work is less likely to pose cultural problems which are harder to address than the quality of language.

d) Westerners might be good at gaining reasonable fluency in new languages, but as **understanding the culture reflected in literature is crucial**, Indians remain better placed.

This option doesn't even talk about the main point i.e. translation

Hence (c)

Q 3. For each of the past three years, temperatures have hit peaks not seen since the birth of meteorology, and probably not for more than 110,000 years. The amount of carbon dioxide in the air is at its highest level in 4 million years. This does not cause storms like Harvey - there have always been storms and hurricanes along the Gulf of Mexico - but it makes them wetter and more powerful. As the seas warm, they evaporate more easily and provide energy to storm fronts. As the air above them warms, it holds more water vapour. For every half a degree Celsius in warming, there is about a 3% increase in atmospheric moisture content. Scientists call this the Clausius-Clapeyron equation. This means the skies fill more quickly and have more to dump. The storm surge was greater because sea levels have risen 20 cm as a result of more than 100 years of human-related global warming which has melted glaciers and thermally expanded the volume of seawater.

a) **The storm Harvey** is one of the regular, annual ones from the Gulf of Mexico; global warming and Harvey are unrelated phenomena.

The storm Harvey is just one example, not the main thrust of the passage

b) Global warming does not breed storms but makes them more destructive; the Clausius-Clapeyron equation, though **it predicts** potential increase in atmospheric moisture content, **cannot predict** the scale of damage storms might wreck.

This is a tempting option at first glance as it is the only one mentioning the Clausius-Clapeyron equation. However, the passage doesn't mention what the equation can or cannot predict, so it is rather unrelated.

c) Global warming melts glaciers, resulting in seawater volume expansion; this enables more water vapour to fill the air above faster. Thus, **modern storms** contain more destructive energy.

This option does not mention the Clausius-Clapeyron equation. However, it does cover the most important aspects, the reasons why storms have been more destructive recently. The start of the passage, which mentions "the past three years", might give us the hint that the focus is on recent events.

d) It is naive to think that rising sea levels and the force of tropical storms are unrelated; **Harvey** was destructive as global warming has armed it with more moisture content, but **this may not be true of all storms**.

Harvey is an example, not an exception. Besides, the option is vague and misses pretty much all the main points of the argument

Hence (c)

CAT Scan – VA (2017) – 2

The passage below is accompanied by a set of three questions. Choose the best answer to each question.

Do sports mega events like the summer Olympic Games benefit the host city economically? It depends, but the prospects are less than rosy. The trick is converting...several billion dollars in operating costs during the 17-day fiesta of the Games into a basis for long-term economic returns. These days, the summer Olympic Games themselves generate total revenue of $4 billion to $5 billion, but the lion's share of this goes to the International Olympics Committee, the National Olympics Committees and the International Sports Federations. Any economic benefit would have to flow from the value of the Games as an advertisement for the city, the new transportation and communications infrastructure that was created for the Games, or the ongoing use of the new facilities.

Evidence suggests that the advertising effect is far from certain. The infrastructure benefit depends on the initial condition of the city and the effectiveness of the planning. The facilities benefit is dubious at best for buildings such as velodromes or natatoriums and problematic for 100,000-seat Olympic stadiums. The latter require a conversion plan for future use, the former are usually doomed to near vacancy. Hosting the summer Games generally requires 30-plus sports venues and dozens of training centers. Today, the Bird's Nest in Beijing sits virtually empty, while the Olympic Stadium in Sydney costs some $30 million a year to operate.

Part of the problem is that Olympics planning takes place in a frenzied and time-pressured atmosphere of intense competition with the other prospective host cities - not optimal conditions for contemplating the future shape of an urban landscape. Another part of the problem is that urban land is generally scarce and growing scarcer. The new facilities often stand for decades or longer. Even if they have future use, are they the best use of precious urban real estate?

Further, cities must consider the human cost. Residential areas often are razed and citizens relocated (without adequate preparation or compensation). Life is made more hectic and congested. There are, after all, other productive uses that can be made of vanishing fiscal resources.

Q 1. The central point in the first paragraph is that the economic benefits of the Olympic Games

a) are shared equally among the three organising committees.

b) accrue mostly through revenue from advertisements and ticket sales.

c) accrue to host cities, if at all, only in the long term.

d) are usually eroded by expenditure incurred by the host city.

Q 2. Sports facilities built for the Olympics are not fully utilised after the Games are over because

a) their scale and the costs of operating them are large.

b) their location away from the city centre usually limits easy access.

c) the authorities do not adapt them to local conditions.

d) they become outdated having being built with little planning and under time pressure.

Q 3. The author feels that the Games place a burden on the host city for all of the following reasons EXCEPT that

a) they divert scarce urban land from more productive uses.

b) they involve the demolition of residential structures to accommodate sports facilities and infrastructure.

c) the finances used to fund the Games could be better used for other purposes.

d) the influx of visitors during the Games places a huge strain on the urban infrastructure.

Solutions:

Let me highlight a few important points in the passage:

Do sports mega events like the summer Olympic Games benefit the host city economically? It depends, but the prospects are less than rosy. The trick is converting...several billion dollars in operating costs during the 17-day fiesta of the Games into a basis for long-term economic returns. These days, the summer Olympic Games themselves generate total revenue of $4 billion to $5 billion, but the lion's share of this goes to the International Olympics Committee, the National Olympics Committees and the International Sports Federations. Any economic benefit would have to flow from the value of the Games as an advertisement for the city, the new transportation and communications infrastructure that was created for the Games, or the ongoing use of the new facilities.

Evidence suggests that the advertising effect is far from certain. The infrastructure benefit depends on the initial condition of the city and the effectiveness of the planning. The facilities benefit is dubious at best for buildings such as velodromes or natatoriums and problematic for 100,000-seat Olympic stadiums. The latter require a conversion plan for future use, the former are usually doomed to near vacancy. Hosting the summer Games generally requires 30-plus sports venues and dozens of training centers. Today, the Bird's Nest in Beijing sits virtually empty, while the Olympic Stadium in Sydney costs some $30 million a year to operate.

Part of the problem is that Olympics planning takes place in a frenzied and time-pressured atmosphere of intense competition with the other prospective host cities - not optimal conditions for contemplating the future shape of an urban landscape. Another part of the problem is that urban land is generally scarce and growing scarcer. The new facilities often stand for decades or longer. Even if they have future use, are they the best use of precious urban real estate?

Further, cities must consider the human cost. Residential areas often are razed and citizens relocated (without adequate preparation or compensation). Life is made more hectic and congested. There are, after all, other productive uses that can be made of vanishing fiscal resources.

Q 1. The central point in the first paragraph is that the economic benefits of the Olympic Games

a) are shared equally among the three organising committees.
"Equally" is not indicated anywhere
b) accrue mostly through revenue from advertisements and ticket sales.
There is no mention of ticket sales in the passage
c) accrue to host cities, if at all, only in the long term.
Only long-term economic returns are mentioned, implying immediate returns are unlikely
d) are usually eroded by expenditure incurred by the host city.
The words "it depends" means that the benefits are not necessarily eroded by expenditure
Hence (c)

Q 2. Sports facilities built for the Olympics are not fully utilised after the Games are over because

a) their scale and the costs of operating them are large. ***Mentioned in the sentence highlighted in blue***

b) their location away from the city centre usually limits easy access.

c) the authorities do not adapt them to local conditions.

d) they become outdated having being built with little planning and under time pressure.

Hence (a)

Q 3. The author feels that the Games place a burden on the host city for all of the following reasons EXCEPT that

a) they divert scarce urban land from more productive uses.
Mentioned in the sentence highlighted in orange

b) they involve the demolition of residential structures to accommodate sports facilities and infrastructure.
Mentioned in the sentence highlighted in red

c) the finances used to fund the Games could be better used for other purposes
Mentioned in the sentence highlighted in green

d) the influx of visitors during the Games places a huge strain on the urban infrastructure.
Not mentioned anywhere in the passage

Hence (d)

CAT Scan – VA (2017) – 3

The passage below is accompanied by a set of three questions. Choose the best answer to each question.

Scientists have long recognised the incredible diversity within a species. But they thought it reflected evolutionary changes that unfolded imperceptibly, over millions of years. That divergence between populations within a species was enforced, according to Ernst Mayr, the great evolutionary biologist of the 1940s, when a population was separated from the rest of the species by a mountain range or a desert, preventing breeding across the divide over geologic scales of time. Without the separation, gene flow was relentless. But as the separation persisted, the isolated population grew apart and speciation occurred.

In the mid-1960s, the biologist Paul Ehrlich - author of The Population Bomb (1968) - and his Stanford University colleague Peter Raven challenged Mayr's ideas about speciation. They had studied checkerspot butterflies living in the Jasper Ridge Biological Preserve in California, and it soon became clear that they were not examining a single population. Through years of capturing, marking and then recapturing the butterflies, they were able to prove that within the population, spread over just 50 acres of suitable checkerspot habitat, there were three groups that rarely interacted despite their very close proximity.

Among other ideas, Ehrlich and Raven argued in a now classic paper from 1969 that gene flow was not as predictable and ubiquitous as Mayr and his cohort maintained, and thus evolutionary divergence between neighbouring groups in a population was probably common. They also asserted that isolation and gene flow were less important to evolutionary divergence than natural selection (when factors such as mate choice, weather, disease or predation cause better-adapted individuals to survive and pass on their successful genetic traits). For example, Ehrlich and Raven suggested that, without the force of natural selection, an isolated population would remain unchanged and that, in other scenarios, natural selection could be strong enough to overpower gene flow...

Q 1. Which of the following best sums up Ehrlich and Raven's argument in their classic 1969 paper?

a) Ernst Mayr was wrong in identifying physical separation as the cause of species diversity.

b) Checkerspot butterflies in the 50-acre Jasper Ridge Preserve formed three groups that rarely interacted with each other.

c) While a factor, isolation was not as important to speciation as natural selection.

d) Gene flow is less common and more erratic than Mayr and his colleagues claimed.

Q 2. All of the following statements are true according to the passage EXCEPT

a) Gene flow contributes to evolutionary divergence.

b) The Population Bomb questioned dominant ideas about species diversity.

c) Evolutionary changes unfold imperceptibly over time.

d) Checkerspot butterflies are known to exhibit speciation while living in close proximity.

Q 3. The author discusses Mayr, Ehrlich and Raven to demonstrate that

a) evolution is a sensitive and controversial topic.

b) Ehrlich and Raven's ideas about evolutionary divergence are widely accepted by scientists.

c) the causes of speciation are debated by scientists.

d) checkerspot butterflies offer the best example of Ehrlich and Raven's ideas about speciation.

Solutions:

Let me highlight a few important points in the passage:

Scientists have long recognised the incredible diversity within a species. But they thought it reflected evolutionary changes that unfolded imperceptibly, over millions of years. That divergence between populations within a species was enforced, according to Ernst Mayr, the great evolutionary biologist of the 1940s, when a population was separated from the rest of the species by a mountain range or a desert, preventing breeding across the divide over geologic scales of time. Without the separation, gene flow was relentless. But as the separation persisted, the isolated population grew apart and speciation occurred.

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Among other ideas, Ehrlich and Raven argued in a now classic paper from 1969 that gene flow was not as predictable and ubiquitous as Mayr and his cohort maintained, and thus evolutionary divergence between neighbouring groups in a population was probably common. They also asserted that isolation and gene flow were less important to evolutionary divergence than natural selection (when factors such as mate choice, weather, disease or predation cause better-adapted individuals to survive and pass on their successful genetic traits). For example, Ehrlich and Raven suggested that, without the force of natural selection, an isolated population would remain unchanged and that, in other scenarios, natural selection could be strong enough to overpower gene flow...

Q 1. Which of the following best sums up Ehrlich and Raven's argument in their classic 1969 paper?

a) Ernst Mayr was wrong in identifying physical separation as the cause of species diversity.
Physical separation is not the only cause, but still remains one cause.

b) Checkerspot butterflies in the 50-acre Jasper Ridge Preserve formed three groups that rarely interacted with each other.
This is the observation on which the argument is based, not the argument itself

c) While a factor, isolation was not as important to speciation as natural selection.
This sums up their argument specifically

d) Gene flow is less common and more erratic than Mayr and his colleagues claimed.
While true, this is more general, and fails to mention any specific argument

Hence (c)

Q 2. All of the following statements are true according to the passage EXCEPT

a) Gene flow contributes to evolutionary divergence.
See the sentence highlighted in yellow: less important still means it does contribute!

b) The Population Bomb questioned dominant ideas about species diversity.
See the sentence highlighted in red: the passage does not say what the book is about

c) Evolutionary changes unfold imperceptibly over time.
Stated directly in the sentence highlighted in blue

d) Checkerspot butterflies are known to exhibit speciation while living in close proximity.
Mentioned in the sentence highlighted in orange

Hence (b)

Q 3. The author discusses Mayr, Ehrlich and Raven to demonstrate that

a) evolution is a sensitive and controversial topic.
Too generic, we are talking of speciation and not evolution in general

b) Ehrlich and Raven's ideas about evolutionary divergence are widely accepted by scientists.
No evidence one way or another of widespread acceptance

c) the causes of speciation are debated by scientists.
This is more precise than option 1, and the best option so far

d) checkerspot butterflies offer the best example of Ehrlich and Raven's ideas about speciation.
They offer one example (the only one we are told of) but we can't be sure of "best"

Hence (c)

The passage below is accompanied by a set of six questions. Choose the best answer to each question.

Understanding where you are in the world is a basic survival skill, which is why we, like most species come hard-wired with specialised brain areas to create cognitive maps of our surroundings. Where humans are unique, though, with the possible exception of honeybees, is that we try to communicate this understanding of the world with others. We have a long history of doing this by drawing maps - the earliest versions yet discovered were scrawled on cave walls 14,000 years ago. Human cultures have been drawing them on stone tablets, papyrus, paper and now computer screens ever since.

Given such a long history of human map-making, it is perhaps surprising that it is only within the last few hundred years that north has been consistently considered to be at the top. In fact, for much of human history, north almost never appeared at the top, according to Jerry Brotton, a map historian... "North was rarely put at the top for the simple fact that north is where darkness comes from" he says. "West is also very unlikely to be put at the top because west is where the sun disappears."

Confusingly, early Chinese maps seem to buck this trend. But, Brotton, says, even though they did have compasses at the time, that isn't the reason that they placed north at the top. Early Chinese compasses were actually oriented to point south, which was considered to be more desirable than deepest darkest north. But in Chinese maps, the Emperor, who lived in the north of the country was always put at the top of the map, with everyone else, his loyal subjects, looking up towards him. "In Chinese culture the Emperor looks south because it's where the winds come from, it's a good direction. North is not very good but you are in a position of subjection to the emperor, so you look up to him," says Brotton.

Given that each culture has a very different idea of who, or what, they should look up to it's perhaps not surprising that there is very little consistency in which way early maps pointed. In ancient Egyptian times the top of the world was east, the position of sunrise. Early Islamic maps favoured south at the top because most of the early Muslim cultures were north of Mecca, so they imagined looking up (south) towards it. Christian maps from the same era (called Mappa Mundi) put east at the top, towards the Garden of Eden and with Jerusalem in the centre.

So when did everyone get together and decide that north was the top? It's tempting to put it down to European explorers like Christopher Columbus and Ferdinand Megellan, who were navigating by the North Star. But Brotton argues that these early explorers didn't think of the world like that at all. "When Columbus describes the world it is in accordance with east being at the top," he says. "Columbus says he is going towards paradise, so his mentality is from a medieval mappa mundi." We've got to remember, adds Brotton, that at the time, "no one knows what they are doing and where they are going."

1. Which one of the following best describes what the passage is trying to do?

a) It questions an explanation about how maps are designed.
b) It corrects a misconception about the way maps are designed.
c) It critiques a methodology used to create maps.
d) It explores some myths about maps.

Q.2) Early maps did NOT put north at the top for all the following reasons EXCEPT

a) North was the source of darkness.
b) South was favoured by some emperors.
c) East and south were more important for religious reasons for some civilisations.
d) East was considered by some civilisations to be a more positive direction.

Q.3) According to the passage, early Chinese maps placed north at the top because

a) the Chinese invented the compass and were aware of magnetic north.
b) they wanted to show respect to the emperor.
c) the Chinese emperor appreciated the winds from the south..
d) north was considered the most desirable direction.

Q.4) It can be inferred from the passage that European explorers like Columbus and Megellan

a) set the precedent for north-up maps.
b) navigated by the compass.
c) used an eastward orientation for religious reasons.
d) navigated with the help of early maps.

Q.5) Which one of the following about the northern orientation of modern maps is asserted in the passage?

a) The biggest contributory factor was the understanding of magnetic north.
b) The biggest contributory factor was the role of European explorers.
c) The biggest contributory factor was the influence of Christian maps.
d) The biggest contributory factor is not stated in the passage.

Q.6) The role of natural phenomena in influencing map-making conventions is seen most clearly in

a) early Egyptian maps.
b) early Islamic maps
c) early Chinese maps
d) early Christian maps

Solutions:

Let me highlight a few important points in the passage:

Understanding where you are in the world is a basic survival skill, which is why we, like most species come hard-wired with specialised brain areas to create cognitive maps of our surroundings. Where humans are unique, though, with the possible exception of honeybees, is that we try to communicate this understanding of the world with others. We have a long history of doing this by drawing maps - the earliest versions yet discovered were scrawled on cave walls 14,000 years ago. Human cultures have been drawing them on stone tablets, papyrus, paper and now computer screens ever since.

Given such a long history of human map-making, it is perhaps surprising that it is only within the last few hundred years that north has been consistently considered to be at the top. In fact, for much of human history, north almost never appeared at the top, according to Jerry Brotton, a map historian... "North was rarely put at the top for the simple fact that north is where darkness comes from" he says. "West is also very unlikely to be put at the top because west is where the sun disappears."

Confusingly, early Chinese maps seem to buck this trend. But, Brotton, says, even though they did have compasses at the time, that isn't the reason that they placed north at the top. Early Chinese compasses were actually oriented to point south, which was considered to be more desirable than deepest darkest north. But in Chinese maps, the Emperor, who lived in the north of the country was always put at the top of the map, with everyone else, his loyal subjects, looking up towards him. "In Chinese culture the Emperor looks south because it's where the winds come from, it's a good direction. North is not very good but you are in a position of subjection to the emperor, so you look up to him," says Brotton.

Given that each culture has a very different idea of who, or what, they should look up to it's perhaps not surprising that there is very little consistency in which way early maps pointed. In ancient Egyptian times the top of the world was east, the position of sunrise. Early Islamic maps favoured south at the top because most of the early Muslim cultures were north of Mecca, so they imagined looking up (south) towards it. Christian maps from the same era (called Mappa Mundi) put east at the top, towards the Garden of Eden and with Jerusalem in the centre.

So when did everyone get together and decide that north was the top? It's tempting to put it down to European explorers like Christopher Columbus and Ferdinand Megellan, who were navigating by the North Star. But Brotton argues that these early explorers didn't think of the world like that at all. "When Columbus describes the world it is in accordance with east being at the top," he says. "Columbus says he is going towards paradise, so his mentality is from a medieval mappa mundi." We've got to remember, adds Brotton, that at the time, "no one knows what they are doing and where they are going."

1. Which one of the following best describes what the passage is trying to do?

a) It questions an explanation about how maps are designed.
There is no questioning, it just offers some opinions rebutting common assumptions

b) It corrects a misconception about the way maps are designed.
This seems the best option; the misconception is indicated in the part marked orange

c) It critiques a methodology used to create maps.
There is no critique of any specific methodology

d) It explores some myths about maps.
The passage doesn't explore myths, rather it mentions some beliefs and attempts to debunk them

Hence (b)

Q.2) Early maps did NOT put north at the top for all the following reasons EXCEPT

a) North was the source of darkness.
Mentioned in the sentence highlighted in green

b) South was favoured by some emperors.
This is, if anything, a reason why maps would put north at the top

c) East and south were more important for religious reasons for some civilisations.
Mentioned in the sentence highlighted in blue

d) East was considered by some civilisations to be a more positive direction.
Implied, in the sentence highlighted in yellow

Hence (b)

Q.3) According to the passage, early Chinese maps placed north at the top because

a) the Chinese invented the compass and were aware of magnetic north.

b) they wanted to show respect to the emperor.
Mentioned explicitly, in the sentences highlighted in red

c) the Chinese emperor appreciated the winds from the south..

d) north was considered the most desirable direction.

Hence (b)

Q.4) It can be inferred from the passage that European explorers like Columbus and Megellan

a) set the precedent for north-up maps.
Contradicts the sentences highlighted in brown "Columbus…in accordance with east being at the top"

b) navigated by the compass.
Contradicts the sentences highlighted in brown "…were navigating by the North Star…"

c) used an eastward orientation for religious reasons.
Implied in the sentences highlighted in brown "…his mentality is from a medieval mappa mundi…"

d) navigated with the help of early maps.
Contradicts the sentences highlighted in brown "…were navigating by the North Star…"

Hence (c)

Q.5) Which one of the following about the northern orientation of modern maps is asserted in the passage?

a) The biggest contributory factor was the understanding of magnetic north.
Not stated anywhere as the biggest contributory factor, just briefly mentioned with respect to China

b) The biggest contributory factor was the role of European explorers.
Contradicted in the sentences marked in brown

c) The biggest contributory factor was the influence of Christian maps.
Contradicted in the sentences marked in blue

d) The biggest contributory factor is not stated in the passage.
This seems the most viable option

Hence (d)

Q.6) The role of natural phenomena in influencing map-making conventions is seen most clearly in

a) early Egyptian maps.
See the sentence marked in yellow; sunrise is a natural phenomemon

b) early Islamic maps
Contradicted in the sentences marked in blue; the main influence in Islamic maps was religious

c) early Chinese maps
Contradicted in the sentences marked in red; the main influence in Chinese maps was political

d) early Christian maps
Contradicted in the sentences marked in blue; the main influence in Christian maps was religious

Hence (a)

CAT Scan – DI (2017) – 1

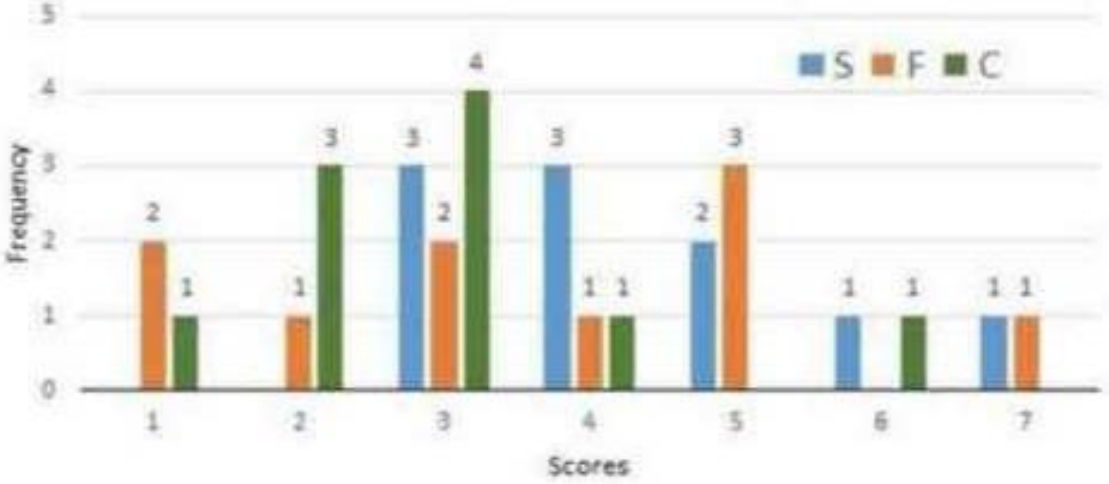
In the next couple of posts, we'll look at some DI from CAT 2017 - Slot 1:

Refer to the data below and answer the questions that follow.

Simple Happiness index (SHI) of a country is computed on the basis of three parameters; social support (S), freedom to life choices (F) and corruption perception (C). Each of these three parameters is measured on a scale of 0 to 8 (integers only). A country is then categorised based on the total score obtained by summing the scores of all the three parameters, as shown in the following table:

Total Score	0-4	5-8	9-13	14-19	20-24
Category	Very Unhappy	Unhappy	Neutral	Happy	Very Happy

Following diagram depicts the frequency distribution of the scores in S, F and C of 10 countries - Amda, Benga, Calla, Delma, Eppa, Varsa, Wanna, Xanda, Yanga and Zooma:



Further, the following are known:

1. Amda and Calla jointly have the lowest total score, 7, with identical scores in all the three parameters.

2. Zooma has a total score of 17.

3. All the 3 countries, which are categorised as happy, have the highest score in exactly one parameter.

1. What is Amda's score in F?

Enter your response (as an integer) using the virtual keyboard.

2. What is Zooma's score in S?

Enter your response (as an integer) using the virtual keyboard.

3. Benga and Delma, two countries categorised as happy, are tied with the same total score. What is the maximum score they can have?

a) 14

b) 15

c) 16

d) 17

4. If Benga scores 16 and Delma scores 15, then what is the maximum number of countries with a score of 13?

a) 0

b) 1

c) 2

d) 3

Analysis:

The information given is not in a format which most of us would find comfortable. The frequency diagram gives us the number of times each of the scores has been given for each of the parameters (for example, the parameter F has received score 1 in two countries, 2 in one country, 3 in two countries and so on)

Let us extract the individual scores from this in a tabular form:

S	3	3	3	4	4	4	5	5	6	7
F	1	1	2	3	3	4	5	5	5	7
C	1	2	2	2	3	3	3	3	4	6

Now looking at the questions:

1. What is Amda's score in F?

Now we know that Amda and Calla have total score 7, with equal scores in all three parameters. Let us note all the possible scores which repeat at least twice:

S	3	3	3	4	4	4	5	5	6	7
F	1	1	2	3	3	4	5	5	5	7
C	1	2	2	2	3	3	3	3	4	6

For a total of 7, only the following two possibilities exist:

Case 1: S – 3, F – 1, C – 3 and

Case 2: S – 4, F – 1, C – 2

In either case, Amda's score in F will be 1. **Hence 1**

2. What is Zooma's score in S?

We know that Zooma has a total score of 17. Also we know that Zooma, being categorised as happy, will have the highest score in exactly one of the three parameters.

Case 1: Zooma has the highest score in S i.e. 7. In this case, the maximum possible Zooma can get in F and C will be 5 and 4 respectively, totalling to 16. So, this case is not possible.

Case 2: Zooma has the highest score in F i.e. 7. In this case, the maximum possible Zooma can get in S and C will be 6 and 4 respectively, totalling to 17. So, this case is possible.

Case 3: Zooma has the highest score in C i.e. 6. In this case, the maximum possible Zooma can get in S and F will be 6 and 5 respectively, totalling to 17. So, this case is also possible.

Now, in both the possible scenarios, Zooma's score in F turns out to be 6. **Hence 6**

3. Benga and Delma, two countries categorised as happy, are tied with the same total score. What is the maximum score they can have?

If we look at the top 3 scores in each parameter i.e. S (7, 6, 5), F (7, 5, 5) and C (6, 4, 3), we will see that they total up to 48. Now out of these, Zooma has got 17. So the other two between then can have a maximum total of 31. Hence they cannot both get 17 or 16. Let us check whether they can both get 15. One possible solution is shown below:

Zooma **Benga** **Delma**

S	3	3	3	4	4	4	5	5	6	7
F	1	1	2	3	3	4	5	5	5	7
C	1	2	2	2	3	3	3	3	4	6

Thus, it is possible for both Benga and Delma to score 15. **Hence (2)**

4. If Benga scores 16 and Delma scores 15, then what is the maximum number of countries with a score of 13?

If we check the total score achieved by all the ten countries in the three parameters, it adds up to 109. We know the scores of Amda (7), Calla(7), Zooma (17), Benga (16) and Delma (15). These add up to 62. Thus we are left with 47 points for the remaining 5 countries (all of which have scored 8 or more).

If one of these countries gets 13 points, the remaining 34 points can be divided among 4 countries such that all of them get 8 or more. However, if 2 countries get 13 points, then the remaining 21 points cannot be distributed among the remaining 3 countries such that all of them get 8 or more. So, at most one country can get a score of 13.

Hence (2)

CAT Scan – DI (2017) – 2

Refer to the data below and answer the questions that follow.

In a square layout of size 5m × 5m, 25 equal-sized square platforms of different heights are built. The heights (in metres) of individual platforms are as shown below:

6	1	2	4	3
9	5	3	2	8
7	8	4	6	5
3	9	5	1	2
1	7	6	3	9

Individuals (all of same height) are seated on these platforms. We say an individual A can reach an individual B if all the three following conditions are met:

(i) A and B are in the same row or column

(ii) A is at a lower height than B

(iii) If there is/are any individual(s) between A and B. such individual(s) must be at a height lower than that of A.

Thus in the table given above, consider the individual seated at height 8 on 3rd row and 2nd column. He can be reached by four individuals. He can be reached by the individual on his left at height 7, by the two individuals on his right at heights of 4 and 6 and by the individual above at height 5.

Rows in the layout are numbered from top to bottom and columns are numbered from left to right.

1. How many individuals in this layout can be reached by just one individual?

a) 3.

b) 5.

c) 7.

d) 8

2. Which of the following is true for any individual at a platform of height 1 m in this layout?

a) They can be reached by all the individuals in their own row and column.

b) They can be reached by at least 4 individuals..

c) They can be reached by at least one individual.

d) They cannot be reached by anyone.

3. We can find two individuals who cannot be reached by anyone in

a) the last row..

b) the fourth row...

c) the fourth column.

d) the middle column.

4. Which of the following statements is true about this layout?

a) Each row has an individual who can be reached by 5 or more individuals..

b) Each row has an individual who cannot be reached by anyone.

c) Each row has at least two individuals who can be reached by an equal number of individuals.

d) All individuals at the height of 9 m can be reached by at least 5 individuals.

Analysis:

We notice that while the information tells us the conditions for A to reach B, the questions never ask how many other positions a given person can reach. Instead, all the questions ask how many people can reach a particular position. So we need to focus on this aspect.

Logically, therefore, the first thing we will need to do will be to figure out, for each position in the layout, how many individuals can reach that position. For example, the first person (at height 6 in the 1st row and 1st column) can be reached by 3 people (those in the first row, in the 2nd, 3rd and 4th columns). The final layout, accordingly, will look like this:

6^{3}	1^{0}	2^{1}	4^{3}	3^{0}
9^{3}	5^{2}	3^{2}	2^{0}	8^{5}
7^{1}	8^{4}	4^{1}	6^{6}	5^{1}
3^{1}	9^{4}	5^{3}	1^{0}	2^{1}
1^{0}	7^{2}	6^{2}	3^{1}	9^{6}

Now the questions can be answered:

1. How many individuals in this layout can be reached by just one individual?

We can see that there are 7 such individuals. **Hence (3)**

2. Which of the following is true for any individual at a platform of height 1 m in this layout?

We can see that no one can reach such individuals. **Hence (4)**

3. We can find two individuals who cannot be reached by anyone in

Checking the options, we find two such individuals in the fourth column. **Hence (3)**

4. Which of the following statements is true about this layout?

Checking the options for counter-examples, we find:
The first option is violated by row 1
The second option is violated by row 3
The fourth option is violated for the person in row 2 column 1
Hence (3)

CAT Scan – QA (2017) – 1

In the next couple of posts I will look at some of the QA questions from CAT 2017 (Slot 1). The crucial thing when solving QA is to realize that there **will** be at least a few easy questions in any given QA section. However, they will be scattered throughout the section and it is essential to be able to pick them out. If you can select the right 10-15 questions to leave, and leave them quickly, you can definitely find 15 or more questions worth solving*. Thus it becomes crucial to ensure that you have seen all the questions. Let me demonstrate by picking (and solving) some of the easy questions from the above paper (in no particular order, except that I will do the TITA questions in this post and the questions with options in the next)

** of course, this statement is predicated upon the assumption that you have done your due diligence in terms of concepts and practice!*

1. Arun's present age in years is 40% of Barun's. In another few years, Arun's age will be half of Barun's. By what percentage will Barun's age increase during this period?

Solution: Since it is a TITA question, the answer will be the same whatever values we start with. So let us assume A as 40 and B as 100 initially. The difference is (and will always remain) 60, so for A to be half of B, A should become 60 and B 120. Thus, B has increased by **20%**

2. A person can complete a job in 120 days. He works alone on Day 1. On Day 2, he is joined by another person who also can complete the job in exactly 120 days. On Day 3, they are joined by another person of equal efficiency. Like this, everyday a new person with the same efficiency joins the work. How many days are required to complete the job?

Solution: Let the total work be 120. Then in n days, $1 + 2 + 3 + \ldots + n = 120$ which gives **n = 15**

3. An elevator has a weight limit of 630 kg. It is carrying a group of people of whom the heaviest weighs 57 kg and the lightest weighs 53 kg. What is the maximum possible number of people in the group?

Solution: Let us make all the people as light as possible i.e. 53 kg. We can see that 53 * 11 = 583 while 53 * 12 = 636. So 12 people cannot fit under any circumstances and the maximum number will be **11**

4. For how many integers n, will the inequality $(n - 5)(n - 10) - 3(n - 2) \leq 0$ be satisfied?

Solution: We are given $(n - 5)(n - 10) - 3(n - 2) \leq 0$. Expanding and simplifying, $n^2 - 15n + 50 - 3n + 6 \leq 0$ or on other words $n^2 - 18n + 56 \leq 0$ or $(n - 14)(n - 4) \leq 0$. This will be satisfied for all n from 4 to 14 (inclusive), which gives us **11 integer values**

5. Ravi invests 50% of his monthly savings in fixed deposits. Thirty percent of the rest of his savings is invested in stocks and the rest goes into Ravi's savings bank account. If the total amount deposited by him in the bank (for savings account and fixed deposits) is Rs 59500, then Ravi's total monthly savings (in Rs) is:

Solution: Suppose Ravi has 100x initially. He invests 50% i.e. 50x in fixed deposits. This leaves 50x, of which he invests 30% i.e. 15x in stocks, leaving a balance 35x. The total deposited in bank, viz. 50x + 35x = 85 x should be 59500. Thus, x = 700 and **100 x = 70000**

6. Let ABC be a right-angled triangle with BC as the hypotenuse. Lengths of AB and AC are 15 km and 20 km, respectively. The minimum possible time, in minutes, required to reach the hypotenuse from A at a speed of 30 km per hour is:

Solution: If AB = 15 and AC = 20 then the hypotenuse BC will be 25. The minimum distance from A to BC will be the perpendicular to the hypotenuse. Let this be x. Now ½ * 15 * 20 = ½ * 25 * x (using area of triangle) so x = 12 km. At a speed of 30 kmph, this will require **24 minutes**

7. A man leaves his home and walks at a speed of 12 km per hour, reaching the railway station 10 minutes after the train had departed. If instead he had walked at a speed of 15 km per hour, he would have reached the station 10 minutes before the train's departure. The distance (in km) from his home to the railway station is:

Solution: 5/4 of speed $\Longrightarrow$ 4/5 of time. In the process he saves 20 min, So, 1/5 of the usual time is 20 min i.e. the usual time is 100 min. Now, 100 min at 12 kmph translates to a distance of **20 km**

8. If $f_1(x) = x^2 + 11x + n$ and $f_2(x) = x$, then the largest positive integer n for which the equation $f_1(x) = f_2(x)$ has two distinct real roots, is:

Solution: $f_1(x) = f_2(x) \Longrightarrow f_1(x) - f_2(x) = 0 \Longrightarrow x^2 + 10x + n = 0$. For this equation to have distinct real roots, $b^2 - 4ac > 0$. So, $100 - 4n > 0$. The maximum integer value of n for which this is true will be **24**

9. Let AB, CD, EF, GH, and JK be five diameters of a circle with center at O. In how many ways can three points be chosen out of A, B, C, D, E, F, G, H, J, K, and O so as to form a triangle?

Solution: We can choose 3 points out of the given 11 in $^{11}C_3 = 165$ ways. However, the 5 cases where the three selected points fall in a straight line (AOB, COD, EOF, GOH and IOJ) would not give us triangles. Subtracting these, we are left with **160 ways**

CAT Scan – QA (2017) – 2

Continuing from last week's post, here are a few more questions from the QA section:

10. If a seller gives a discount of 15% on retail price, she still makes a profit of 2%. Which of the following ensures that she makes a profit of 20%?

a) Give a discount of 5% on retail price.
b) Give a discount of 2% on retail price.
c) Increase the retail price by 2%.
d) Sell at retail price.

Solution: Let the CP be 100. Now a profit of 2% means SP = 102. Also, this is after a 15% discount $\Longrightarrow$ 0.85 MP = 102 $\Longrightarrow$ MP = 120. So selling at MP i.e. retail price will give 20% profit. **Hence (d)**

11. Suppose, C1, C2, C3, C4, and C5 are five companies. The profits made by C1, C2, and C3 are in the ratio 9 : 10 : 8 while the profits made by C2, C4, and C5 are in the ratio 18 : 19 : 20. If C5 has made a profit of Rs 19 crore more than C1, then the total profit (in Rs) made by all five companies is:

a) 438 crore
b) 435 crore
c) 348 crore
d) 345 crore

Solution: We see that C2 is common in the two ratios given. Let us take C2 = 90k (the LCM of 10 and 18). Then, since C1 : C2 : C3 = 9 : 10 : 8, we get C1 to be 81k and C3 72k. Also since C2 : C4 : C5 = 18 : 19 : 20, we get C4 to be 95k and C5 to be 100k. Since C5 – C1 = 100k – 81k = 19 crore, k = 1 crore. The total profit will therefore be 81k + 90k + 72k + 95k + 100k = 438 crore. **Hence (a)**

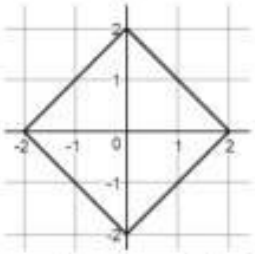
12. In a market, the price of medium quality mangoes is half that of good mangoes. A shopkeeper buys 80 kg good mangoes and 40 kg medium quality mangoes from the market and then sells all these at a common price which is 10% less than the price at which he bought the good ones. His overall profit is:

a) 6%
b) 8%
c) 10%
d) 12%

Solution: Let us assume the price of a good mango as 100 and that of a medium one as 50. Also, let us scale the problem down to 2 good mangoes and 1 medium mango. So the cost price will be 2*100 + 1*50 = 250 while the selling price will be 3*90 = 270. The profit will be 20/250 = 8%. **Hence (b)**

13. The area of the closed region bounded by the equation $|x| + |y| = 2$ in the two-dimensional plane is:

a) 4π
b) 4
c) 8
d) 2π



Solution: The region will be a diamond shape (rhombus) with diagonals along the axes, as shown in the figure alongside. Both x and y can range from -2 to 2, so each diagonal will be of length 4. Now the area of a rhombus is ½ * product of diagonals; this gives us ½ * 4 * 4 = 8. **Hence (c)**

14. A solid metallic cube is melted to form five solid cubes whose volumes are in the ratio 1 : 1 : 8 : 27 : 27. The percentage by which the sum of the surface areas of these five cubes exceeds the surface area of the original cube is nearest to:

a) 10
b) 50
c) 60
d) 20

Solution: The smaller cubes have volumes in the ratio $1 : 1 : 8 : 27 : 27 \Longrightarrow$ their sides will be in the ratio $k : k : 2k : 3k : 3k$ The total volume of the 5 smaller cubes is 64 times the smallest one, so the original cube will have a side 4k. The surface area of the original cube will then be $96k^2$, while that of the smaller ones will be $k^2 (6 + 6 + 24 + 54 + 54) = 144\ k^2$, which is 50% higher. **Hence (b)**

15. In how many ways can 7 identical erasers be distributed among 4 kids in such a way that each kid gets at least one eraser but nobody gets more than 3 erasers?

a) 16
b) 20
c) 14
d) 15

Solution: We can first give each kid one eraser. This leaves 3 erasers which can be distributed among the 4 kids in ${}^{3+3}C_3 = 20$ ways. However, this includes 4 cases where all the three erasers went to a single kid, which means that kid would have 4 erasers in total, which violates the given condition. So removing these 4 cases leaves us with 16 ways. **Hence (a)**