October 10, 2018

Q.1) Consider the following statements about 'Security Policy Group (SPG)'

1. It will assist the National Security Council
2. It will chaired by the Cabinet Secretary

Select the correct statements

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.1) Solution (a)

The government has set up a panel, headed by NSA Ajit Doval, to assist the National Security Council, which advises the prime minister on matters of national security and strategic interests

The Strategic Policy Group (SPG) will assist the National Security Council and undertake among other tasks, a long-term strategic review of country's security affairs.

It will be the principal mechanism for inter-ministerial coordination and integration of relevant inputs in the formulation of national security policies

The SPG will be chaired by National Security Advisor (NSA) Doval and its members include the NITI Aayog vice chairman, the cabinet secretary, the chiefs of the three defence services, the RBI governor, the foreign secretary, the home secretary, the finance secretary and the defence secretary.

The secretary of the Department of Defence Production and Supplies, the scientific adviser to the defence minister and the secretary (R), Cabinet Secretariat will also be members of the panel.

The other members are secretary, Department of Revenue; secretary, Department of Atomic Energy; secretary, Department of Space; director, Intelligence Bureau and secretary, National Security Council Secretariat.

Source: https://economictimes.indiatimes.com/news/defence/government-sets-up-key-panel-under-nsa-to-assist-national-security-council/articleshow/66122939.cms

Q.2) Consider the following statements with respect to 'Intergovernmental Panel on Climate Change (IPCC)'

1. It is the United Nations body for assessing the science related to climate change.
2. It was established by the United Nations Environment Programme (UN Environment) and the World Meteorological Organization (WMO).

Select the correct statements

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.2) Solution (c)

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. It was established by the United Nations Environment Programme (UN Environment) and the World Meteorological Organization (WMO) in 1988 to provide policymakers with regular scientific assessments concerning climate change, its implications and risks, as well as to put forward adaptation and mitigation strategies. It has 195 member states.

IPCC assessments provide governments, at all levels, with scientific information that they can use to develop climate policies. IPCC assessments are a key input into the international negotiations to tackle climate change. IPCC reports are drafted and reviewed in several stages, thus guaranteeing objectivity and transparency.

The IPCC assesses the thousands of scientific papers published each year to tell policymakers what we know and don't know about the risks related to climate change. The IPCC identifies where there is agreement in the scientific community, where there are differences of opinion, and where further research is needed. It does not conduct its own research.

To produce its reports, the IPCC mobilizes hundreds of scientists. These scientists and officials are drawn from diverse backgrounds. Only a dozen permanent staff work in the IPCC's Secretariat.

The IPCC has three working groups: Working Group I, dealing with the physical science basis of climate change; Working Group II, dealing with impacts, adaptation and vulnerability; and Working Group III, dealing with the mitigation of climate change. It also has a Task Force on National Greenhouse Gas Inventories that develops methodologies for measuring emissions and removals.

IPCC Assessment Reports consist of contributions from each of the three working groups and a Synthesis Report. Special Reports undertake an assessment of cross-disciplinary issues that span more than one working group and are shorter and more focused than the main assessments.

Source: https://www.thehindubusinessline.com/news/science/global-warming-impacts-on-india-will-be-huge-ipcc/article25157254.ece

Q.3) Consider the following statements about 'Voyager 2'

1. It is a space probe launched by NASA
2. It was launched along with Cassini–Huygens Mission

Select the correct statements

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.3) Solution (a)

Voyager 2 is a space probe launched by NASA on August 20, 1977, to study the outer planets. Part of the Voyager program, it was launched 16 days before its twin, Voyager 1, on a trajectory that took longer to reach Jupiter and Saturn but enabled further encounters with Uranus and Neptune. It is the only spacecraft to have visited either of the ice giants.

Source: https://www.thehindu.com/todays-paper/tp-life/nasa-probe-nearing-interstellar-space/article25152188.ece

Q.4) Which of the following are considered as 'ice giants' in the Solar System?

1. Uranus
2. Neptune
3. Venus

Select the correct code:

a) 1 and 2
b) 2 and 3

c) 1 and 3
d) All of the above

Q.4) Solution (a)

An ice giant is a giant planet composed mainly of elements heavier than hydrogen and helium, such as oxygen, carbon, nitrogen, and sulfur. There are two known ice giants in the Solar System: Uranus and Neptune.

Q.5) Which of the following is an application of NN (Neural Network)?

1. Sales forecasting
2. Data validation
3. Risk management

Select the correct code:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.5) Solution (d)

What is a Neural Network?

An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the way biological nervous systems, such as the brain, process information. The key element of this paradigm is the novel structure of the information processing system. It is composed of a large number of highly interconnected processing elements (neurones) working in unison to solve specific problems. ANNs, like people, learn by example. An ANN is configured for a specific application, such as pattern recognition or data classification, through a learning process. Learning in biological systems involves adjustments to the synaptic connections that exist between the neurones. This is true of ANNs as well.

Why use neural networks?

Neural networks, with their remarkable ability to derive meaning from complicated or imprecise data, can be used to extract patterns and detect trends that are too complex to be noticed by either humans or other computer techniques. A trained neural network can be thought of as an "expert" in the category of information it has been given to analyse. This expert can then be used to provide projections given new situations of interest and answer "what if" questions.

Other advantages include:

- Adaptive learning: An ability to learn how to do tasks based on the data given for training or initial experience.
- Self-Organisation: An ANN can create its own organisation or representation of the information it receives during learning time.
- Real Time Operation: ANN computations may be carried out in parallel, and special hardware devices are being designed and manufactured which take advantage of this capability.
- Fault Tolerance via Redundant Information Coding: Partial destruction of a network leads to the corresponding degradation of performance. However, some network capabilities may be retained even with major network damage.

Neural networks versus conventional computers

Neural networks take a different approach to problem solving than that of conventional computers. Conventional computers use an algorithmic approach i.e. the computer follows a set of instructions in order to solve a problem. Unless the specific steps that the computer needs to follow are known the computer cannot solve the problem. That restricts the problem solving capability of conventional computers to problems that we already understand and know how to solve. But computers would be so much more useful if they could do things that we don't exactly know how to do.

Neural networks process information in a similar way the human brain does. The network is composed of a large number of highly interconnected processing elements(neurones) working in parallel to solve a specific problem. Neural networks learn by example. They cannot be programmed to perform a specific task. The examples must be selected carefully otherwise useful time is wasted or even worse the network might be functioning incorrectly. The disadvantage is that because the network finds out how to solve the problem by itself, its operation can be unpredictable.

On the other hand, conventional computers use a cognitive approach to problem solving; the way the problem is to solved must be known and stated in small unambiguous instructions. These instructions are then converted to a high level language program and then into machine code that the computer can understand. These machines are totally predictable; if anything goes wrong is due to a software or hardware fault.

Neural networks and conventional algorithmic computers are not in competition but complement each other. There are tasks are more suited to an algorithmic approach like arithmetic operations and tasks that are more suited to neural networks. Even more, a large number of tasks, require systems that use a combination of the two approaches (normally a conventional computer is used to supervise the neural network) in order to perform at maximum efficiency.

Given this description of neural networks and how they work, what real world applications are they suited for? Neural networks have broad applicability to real world business problems. In fact, they have already been successfully applied in many industries.

Since neural networks are best at identifying patterns or trends in data, they are well suited for prediction or forecasting needs including:

- sales forecasting
- industrial process control
- customer research
- data validation
- risk management
- target marketing

THINK!

- Applications of Neural networks in medicine and Business