

**Q.1) Which of the following is/are correct with respect to 'Neural Networks'?**

1. They are artificial copy of the human brain
2. They have high computational rates than conventional computers
3. They learn by examples

**Select the correct code:**

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

**Q.1) Solution (d)**

ANNs are processing devices (algorithms or actual hardware) that are loosely modeled after the neuronal structure of the mammalian cerebral cortex but on much smaller scales. A large ANN might have hundreds or thousands of processor units, whereas a mammalian brain has billions of neurons with a corresponding increase in magnitude of their overall interaction and emergent behavior. Although ANN researchers are generally not concerned with whether their networks accurately resemble biological systems, some have. For example, researchers have accurately simulated the function of the retina and modeled the eye rather well.

By looking for common patterns in millions of bicycle photos, for instance, a neural network can learn to recognise a bike.

This is how Facebook identifies faces in online photos, how Android phones recognise commands spoken into phones, and how Microsoft Skype translates one language into another. But these complex systems can also create art.

In the 1990s, neural networks were used for cross-breeding sounds from very different instruments. Say, a bassoon and a clavichord. Creating instruments capable of producing sounds no one has ever heard.

Much as a neural network can learn to identify a cat by analysing hundreds of cat photos, it can learn the musical characteristics of a bassoon by analysing hundreds of notes.

**How Do Neural Networks Differ From Conventional Computing?**

To better understand artificial neural computing it is important to know first how a conventional 'serial' computer and its software process information. A serial computer has a central processor that can address an array of memory locations where data and instructions are stored. Computations are made by the processor reading an instruction as well as any data the instruction requires from memory addresses, the instruction is then

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executed and the results are saved in a specified memory location as required. In a serial system (and a standard parallel one as well) the computational steps are deterministic, sequential and logical, and the state of a given variable can be tracked from one operation to another.

In comparison, ANNs are not sequential or necessarily deterministic. There are no complex central processors, rather there are many simple ones which generally do nothing more than take the weighted sum of their inputs from other processors. ANNs do not execute programmed instructions; they respond in parallel (either simulated or actual) to the pattern of inputs presented to it. There are also no separate memory addresses for storing data. Instead, information is contained in the overall activation 'state' of the network. 'Knowledge' is thus represented by the network itself, which is quite literally more than the sum of its individual components.

### What Applications Should Neural Networks Be Used For?

Neural networks are universal approximators, and they work best if the system you are using them to model has a high tolerance to error. One would therefore not be advised to use a neural network to balance one's cheque book! However they work very well for:

- capturing associations or discovering regularities within a set of patterns;
- where the volume, number of variables or diversity of the data is very great;
- the relationships between variables are vaguely understood; or,
- the relationships are difficult to describe adequately with conventional approaches.

Source: <https://indianexpress.com/article/technology/science/worlds-largest-brain-like-supercomputer-switched-on-for-first-time-5441398/>

**Q.2) The term 'SpiNNaker' was recently in news. What is it?**

- a) Unmanned Aerial Vehicle
- b) Anti-Ballistic Missile developed by Israel
- c) Microprocessor developed by IIT Madras
- d) Supercomputer

### Q.2) Solution (d)

The world's largest supercomputer designed to work in the same way as the human brain has been switched on for the first time. The newly formed million-processor-core Spiking Neural Network Architecture (SpiNNaker) machine is capable of completing more than 200 million actions per second, with each of its chips having 100 million transistors.

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The SpiNNaker machine, designed and built in The University of Manchester in the UK, can model more biological neurons in real time than any other machine on the planet. Biological neurons are basic brain cells present in the nervous system that communicate primarily by emitting 'spikes' of pure electro-chemical energy. Neuromorphic computing uses large scale computer systems containing electronic circuits to mimic these spikes in a machine. SpiNNaker is unique because, unlike traditional computers, it does not communicate by sending large amounts of information from point A to B via a standard network.

Source: <https://indianexpress.com/article/technology/science/worlds-largest-brain-like-supercomputer-switched-on-for-first-time-5441398/>

**Q.3) Where is 'Saqqara' located?**

- a) Egypt
- b) Jordan
- c) Greece
- d) Syria

**Q.3) Solution (a)**

Saqqara served as the necropolis for Memphis, the capital of ancient Egypt for more than two millennia.

Source: <https://www.hindustantimes.com/art-and-culture/mummified-cats-scarab-beetles-unearthed-in-egypt/story-uXrn0JXUllgbLglwX5brEL.html>

**Q.4) Where is 'Point Calimere Wildlife Sanctuary' located?**

- a) Tamil Nadu
- b) West Bengal
- c) Kerala
- d) Goa

**Q.4) Solution (a)**

It is a protected area in Tamil Nadu, South India along the Palk Strait where it meets the Bay of Bengal at Point Calimere.

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The sanctuary was created in 1967 for conservation of the near threatened blackbuck antelope, an endemic mammal species of India. It is famous for large congregations of waterbirds, especially greater flamingos.

Source: <https://www.thehindu.com/sci-tech/is-point-calimere-wildlife-sanctuary-safe-for-migratory-birds/article25463648.ece>

**Q.5) Consider the following statements about 'Atala Masjid' of Jaunpur**

1. It was built by Sultan Sikandar Lodi
2. The style of Atala Masjid's architecture is known as Sharqi Style

**Select the correct statements**

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

**Q.5) Solution (b)**

Atala Masjid or Atala Mosque is a 15th-century mosque in Jaunpur, Uttar Pradesh, India. It is one of the chief tourist attractions in Jaunpur.

It is located 2.2 km north-northeast of Jaunpur, 7.3 km northwest of Zafarābād, 16.8 km north-northeast of Mariāhū, 26.3 km west-northwest of Kirākat.

The architecture inside still shows old Atala Devi Temple, which was built by Raja Vijaya Chandra, father-in-law of King Prithviraj Chauhan.

The Jaunpur Atala Masjid was built by Sultan Ibrahim (1402–1436), Sharqi Sultan of Jaunpur on foundations laid during the reign of Tughluq Sultan Firuz Shah III (1351–1388).

Construction started in 1377 and was completed in 1408. A Madarsa named Madarsa Din Dunia is housed in central courtyard of the mosque.

The style of Atala Masjid's architecture is known as Sharqi Style. The use of minars has been avoided in Atala Masjid. A unique feature of this building is use of bold and forceful characters painted on the huge screen in the centre and side bays of the prayer hall.