Objective Questions:

Q.1) The Nagara, the Dravida and the Vesara are the
a) three main racial groups of the Indian subcontinent
b) three main linguistic divisions into which the languages of India can be classifi ed
c) three main styles of Indian temple architecture
d) three main musical Gharanas prevalent in India

Ans) c
Exp) Option c is correct
Three main styles of **temple architectur**e are the Nagara or the Northern style, the Dravida or the Southern style and the Vesara or Mixed style.

Q.2) Some Buddhist rock-cut caves are called Chaityas,while the others are called Viharas. What is the difference between the two?
a) Vihara is a place of worship, while Chaitya is the dwelling place of the monks
b) Chaitya is a place of worship, while Vihara is the dwelling place of the monks
c) Chaitya is the stupa at the far end of the cave, while Vihara is the hall axial to it
d) Th ere is no material diff erence between the two

Ans) b
Exp) Option b is correct
Chaitya was a **rectangular prayer** hall with a stupa placed in the center, the purpose was prayer and discussions. Viharas on the other hand are constructions built in order to provide resting places for the monks. Viharas did not have stupas.

Q.3) Which of the following is correct regarding Nagara style of temple architecture?
a) It was popular in Central and Southern India.
b) Latina, Phamsana and Valabhi style are its three subtypes based on the shikharas.
c) A pyramidal structure called Vimana is used at the top of the temple.
d) Presence of water tank and elaborate boundary walls around temple is an important feature of this style.

Ans) b
Exp) Option b is correct.
Option a is incorrect: Nagara style of temple architecture is popular in Northern India. Th is type of temple followed the **panchayatan style** of temple making and was built on an **upraised platform with pillared approach. Presence of assembly halls** or mandaps in front of garbhagriha and **images of river goddess like Ganga and Yamuna are placed on walls of garbhgriha. Kandariya Mahadeo temple of Khajuraho** is an example of this style of temple architecture.
Option b is correct: **Latina, Phamsana and Valabhi style are three subtypes of nagara style based on the shikharas.** Latina or rekha-prasad style of shikhara is square at base and has curvilinear walls. Phamsana style had a broader base and shorter in height than latina type. Whereas Valabhi style have rectangular base with roof rising into vaulted chambers.
Option c is incorrect: **A pyramidal structure called Vimana is used at the top of the temple in southern India**. It is a unique feature of Dravidian style. Whereas, **Shikhara is used as a crowning element at the top of the temple in Nagara style.** They are mountain like spire of a free-standing temple which has a curving shape or curves inward.

Option d is incorrect: Nagara styles of temple did **not have water tank or reservoir and an elaborate boundary walls around temple.** Th ese are the features of Dravidian style of temple architecture.

Q.4) Which reference to temple architecture in India, consider the following statements:
1. In Odisha School, mandapa and shikhara were known as jagmohan and deul respectively.
2. Th e theme of Solanki School was largely erotic in nature.
3. Khajuraho School of temple architecture was also known as maru-gujara style.
Which of the statements given above is/are correct?
a) 1 only
b) 2 only
c) 2 and 3 only
d) 1 and 3 only

Ans) a
Exp) Option a is correct.
Statement 1 is correct: Nagara style of **temple architecture evolved regionally in diff erent regions like in Odisha, Khajuraho and Rajasthan etc.** Odisha School usually had boundary walls and beautifully carved exterior walls. In this school, **mandapa and shikhara are known as jagmohan and deul respectively.**
Statement 2 is incorrect: Th e **theme of Khajuraho school is generally erotic in nature based on Kamasutra literature.** Th is school evolved **under the patronage of chandella rulers of Khajuraho during 900 AD to 1100 AD.** Th ese temples developed on higher platform and panchayatan style was followed.
Statement 3 is incorrect: **Solanki school of temple architecture was also known as maru-gujara style**. This school developed under the **patronage of Solanki rulers of Gujarat and Rajasthan during 1100 AD to 1300 AD.** It was not fundamentally diff erent from Khajuraho and had main feature like **minute and lovely decorative carvings. Mostly, sandstone and grey/black basalt are used for temple construction.**

Q.5) Which of the following are the features of Brihadiswara temple architecture in South India?
1. Pyramidal multi-storeyed vimana
2. Two large gopurams
3. Octagonal dome-shaped stupika
4. Murals on boundary walls
Select the correct answer using the code given below:
a) 1 and 2 only
b) 1, 2 and 3 only
c) 1, 2 and 4 only
d) 1, 2, 3 and 4

Ans) d
Exp) Option d is correct.
The magnificent **Shiva temple of Thanjavur**, called the **Rajarajeswara or Brihadiswara** temple, was completed around **1009 by Rajaraja Chola**, and is the largest and tallest of all Indian temples. It was built in the **Dravidian style** of architecture.
Features of the temple include –
1. Pyramidal multi-storeyed vimana, topped by a monolithic shikhara which is an octagonal domeshaped stupika.

2. For the first time **two large gopuras/gopurams** (gateway towers) with elaborate sculptures.
3. Huge **Nandi-fi gures on the corners of the shikhara**, with the kalasha above it.
4. Hundreds of **stucco fi gures** decorate the vimana.
5. Th e **boundary walls** surrounding the sanctum have mythological narratives which are depicted through **painted murals and sculptures**.

Q.6) Consider the following statements with reference to the Machine learning:
1. Machine learning is a subset of deep learning that relates the recurrent neural networks and artifi cial neural networks together.
2. The primary aim of machine learning is to develop computer programs that access the required data and utilize it for learning by themselves.
3. Machine learning plays a significant role in selfdriving cars.
Which of the statements given above is/are correct?
a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

Ans) b
Exp) Option b is correct.
Machine learning (ML) is a type of artifi cial intelligence (AI) that allows soft ware applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.
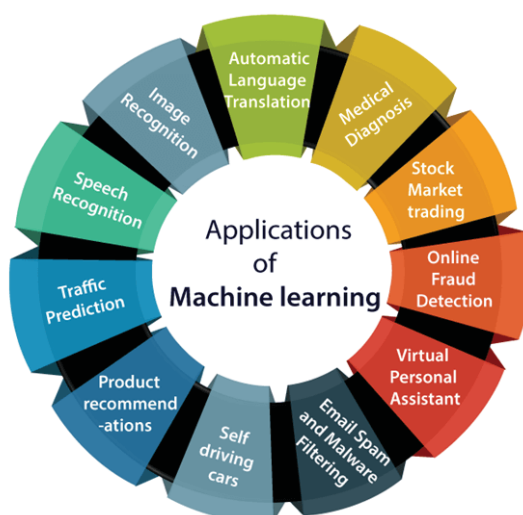**Statement 1 is incorrect. Machine learning** is an application and **subset of AI (Artifi cial Intelligence**) that provides a system with the **ability to learn** from its experiences and improve accordingly without someone **physically programming those changes into it**. Machine learning lets systems and devices improve without being programmed to that particular level. It makes use of data for training so that it can find some accurate results.
Deep learning is basically a subset of machine learning that relates **the recurrent neural networks** and **artifi cial neural networks together**. Its algorithms are exactly like machine learning.
Statement 2 is correct. Th e primary aim of **machine learning is to develop computer programs that access the required data and utilize it for learning by themselves**. Th e process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the examples that we provide.
Statement 3 is correct. Th ere are number of applications of the machine learning. One of the most exciting applications of machine learning is self-driving cars. **Machine learning plays a significant role in self-driving cars.** Tesla, the most popular car manufacturing company is working on self-driving car. It is using unsupervised learning method to train the car models to detect people and objects while driving.

Q.7) Which of the following is incorrect with reference to the QR (quick response) code and Bar code functions:
a) QR code contains more information than a barcode.
b) QR code only contains information in a horizontal direction.
c) Unlike a normal barcode, QR code is two dimensional.
d) QR code works even if the printed code is damaged or soiled.

Ans) b
Exp) Option b is correct.
A QR code (Quick Response code) is a type of matrix barcode (or two-dimensional barcode invented in 1994 by the Japanese automotive company Denso Wave. A barcode is a machine-readable optical label that can contain information about the item to which it is attached.
Option a is correct. QR code contains information in both a horizontal and a vertical direction, hence
the name "2-dimensional code." Due to this structural difference, a **QR code contains a hundred times more information than a barcode** and has a greater potential to store more information in a smaller space than a barcode.
Option b is incorrect. One of the biggest differences comes in terms of the diff erences between their designs or simply how they look. Th is also applies to the design of the two codes. **A barcode (and not QR code) only contains information in a horizontal direction.**
Option c is correct. QR code, is similar to a barcode. Like barcode, it also contains machine-readable information about the object it is attached to. Unlike a normal barcode, however, **a QR code is two-dimensional**, i.e., it contains information in both the vertical and horizontal directions.
Option d is correct. Adaptation and error corrections are less in the QR codes. Th is is by far the most desirable advantage of QR codes over conventional barcodes. QR
codes have an error rate of 7-30%. Simply put, **even if the packaging of the product in question or the printed code is damaged or soiled, the QR code works.** Th is feature is smartly used by companies and businesses. Because of the error-correction feature, they can (and do) put a small logo or a picture within the code to make it more associable to the business in question.

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QR code and Bar code

Q.8) Which of the following describes the Chandrashekhar Limit?
a) It is the maximum mass a white dwarf star can have before becoming unstable.
b) It is the minimum distance after which an object cannot return to Earth.
c) It is the limit below which electron degeneracy pressure is not enough to prevent gravity.
d) It is the gravity of Sun, which holds together all the planets in our solar system.

Ans) a
Exp) Option a is the correct answer.
Th e Chandrasekhar Limit of 1.4 solar masses, is the theoretical maximum mass a white dwarf star can have and still remain a white dwarf (though this limit does vary slightly depending on the metallicity). Above this mass, electron degeneracy pressure is not enough to prevent gravity from collapsing the star further into a neutron star or black hole.Th e limit is named after the Nobel laureate **Subrahmanyan Chandrasekhar**, who first proposed the idea in **1931**.

Q.9) Which of the following is correct with reference to Hyper spectral imaging technology:
a) Hyper spectral imaging is a technique that analyzes a wide spectrum of light instead of assigning primary colors to each pixel.
b) Hyper spectral imaging has been particularly useful in satellite technology only.
c) Unlike optical technologies which can scan full color spectrum, Hyper spectral imaging can only scan for a single color.
d) Th e spectral range in hyper spectral data cannot extend beyond the visible range.

Ans) a
Exp) Option a is correct.
Hyperspectral imaging, like other spectral imaging, collects and processes information from across the electromagnetic spectrum. Th e goal of hyperspectral
imaging is to obtain the spectrum for each pixel in the image of a scene, with the purpose of finding objects, identifying materials, or detecting processes.
Statement a is correct. Hyper spectral imaging (HSI) is a technique that analyses a **wide spectrum of light** instead of just **assigning primary colours (red, green, blue) to each pixel**. Th e light striking each pixel is broken down into many diff erent spectral bands in order to provide more information on what is imaged.
Statement b is incorrect. Th e algorithms and the image processing methodologies associated with HSI are a product of **military research**, and were primarily used to identify targets and other objects against background clutter. In the past, HSI has seen **civil applications**, and has particularly been useful **in satellite technology.** It might become an inexpensive, promising, and quick tool for the assessment of tissue conditions at diagnosis

and during surgery. Th e medical applications **include forensics**, **detection of colorectal and gastric cancer.**

Statement c is incorrect. In HSI, the unique colour signature of an individual object can be detected. Unlike **other optical technologies** that can only **scan for a single colour**, **HSI** is able to distinguish **the full colour spectrum in each pixel**. Th erefore, it provides spectral information in addition to 2D spatial images.

Statement d is incorrect. Hyper spectral data cubes can contain absorption, refl ectance, or fluorescence spectrum data for each image pixel. It is assumed that HSI data is spectrally sampled at more than 20 equally distributed wavelengths. Th e **spectral range** in hyper spectral data **can extend beyond the visible range (ultraviolet, infrared).**

Q.10) Consider the following systems:
1. Cognitive computing can simulate human thought.
2. Th e personal digital assistants we have on our phones and computers are the highest example of cognitive computing systems.
Which of the statements given above is/are correct?
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Ans) a
Exp) Option a is correct.
Emerging technologies are science-based innovations with the potential to create a new industry or transform an existing one which will substantially alter the business and social environment along with emerging new cognitive computing models. Cognitive computing, a subfi eld of artifi cial intelligence, simulates human thought processes in machines using self-learning algorithms through data mining, pattern recognition, and natural language processing.

Statement 1 is correct. Th e goal of **cognitive computing is to simulate human thought** processes in a computerized model. Using self-learning algorithms that use data mining, pattern recognition and natural language processing, the computer can mimic the way the human brain works.

Statement 2 is incorrect. Th e personal digital assistants we have on our phones and computers now (Siri and Google among others) are not true cognitive systems; they have a pre-programmed set of responses and can only respond to a preset number of requests.

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