UNIT I: The RAMAN EFFECT

1.Discuss the early life of Sir C.V.Raman.

C.V.Raman's Early Life: Chandrasekhara Venkata Raman was born at Tiruchirappalli in Southern India on November 7th, 1888. His father was a lecturer in mathematics and physics so that from the first he was immersed in an academic atmosphere. He entered Presidency College, Madras, in 1902, and in 1904 passed his B.A. examination, winning the first place and the gold medal in physics; in 1907 he gained his M.A. degree, obtaining the highest distinctions.

2.State the other works of C.V.Raman apart from Raman effect.
Scientific research of cv raman

Other Scientific Researches: Raman led experiments at the IACS with collaborators, including K. S. Krishnan, on the scattering of light, which is now called the Raman effect. By the year 1921 leading physicists like J.J. Thomson and Lord Rutherford were already acquainted with Raman's significant study in the field of Optics and Acoustics wherein he studied the percussions of instruments like tabla and mridangam and related their sounds to mathematics.

3&4 What prompted Sir C.V.Raman to discover the Raman Effect?

Factors that led to the discovery of Raman Effect: Raman was struck by the blue colour of the Mediterranean Sea. Scientists believed that the blue colour of the sea was actually a reflection of the sky which was confirmed by Physicist Lord Rayleigh. But Raman was not convinced by this explanation. To verify his speculations he used polarized Nicol Prism on sea water sample to show light was scattered by water molecules-a phenomenon that he called molecular diffraction.

5.Why was Raman awarded the Nobel Prize?

Raman Effect: Raman initiated research in three areas: the scattering of light by liquids, the scattering of x-rays by liquids and the viscosity of liquids. Of these three areas the scattering of light by liquids fetched him the Nobel Prize. Later for seven years he conducted many experiments along these lines with his associates KR Ramanathan and K S Krishnan. The team had indisputable proof about the modified radiations observed in scattering experiments due to molecular fluctuations. The discovery was announced through the Associated Press on 29th February and 8th March. In this regard with a sense of affirmation he addressed the gathering at the south Indian association on 16th March 1928.He proposed the new kind of radiation or light emission from atoms & molecules. His experiments and findings were confirmed and he was conferred the Nobel Prize. Raman had confidently announced at a meeting of Royal society of Fellows in 1924 that he would win the Nobel Prize in Physics.

6. What are the three areas in which raman initiated his research?

Raman initiated research in three areas, on his return to India.The scattering of light by liquids The scattering of x-rays by liquids.The viscocity of liquids

Over the next seven years, raman along with his distinguished associates such as K R Ramanathan and KS Krishnan, conducted and supervised many experiments along these lines

8. What are the other awards conferred to Sir C.V.Raman?

He was elected a Fellow of the Royal Society[1] early in his career (1924) and knighted in 1929. He resigned from the Fellowship of the Royal Society in 1968 for unrecorded reasons, the only Indian FRS ever to do so.[35]

In 1930 he won the Nobel Prize in Physics.

In 1941 he was awarded the Franklin Medal.

In 1954 he was awarded the Bharat Ratna.[36]

He was awarded the Lenin Peace Prize in 1957. In 1998, the American Chemical Society and Indian Association for the Cultivation of Science recognised Raman's discovery as an International Historic Chemical Landmark.[37]

India celebrates National Science Day on 28 February of every year to commemorate the discovery of the Raman effect in 1928.[38] Postal stamps featuring Raman were issued in 1971 and 2009.

9.Explain Raman's Spectroscopy.

Raman's Spectroscopy: Raman discovered that when a light beam travels through a medium, it is deflected by the molecules in the medium. a small part of the light beam after the deflection, had a different wave length and colour from the phenomenon. this initiated the study of Raman Spectroscopy.

10.Cite the advantages of Raman Effect.

Advantages of Raman Effect: Raman clearly explained how light travels through a medium and a light beam are deflected by the molecules in the medium. The experiment was named after him as Raman Effect which led to the discovery of Raman Spectroscopy, a field of study that has a lot of practical applications like handheld scanners and in the pharmaceutical industry.

UNIT II: ANCIENT ARCHITECTURE IN INDIA

1.Enumerate the architecture during the reign of Chandragupta Maurya

One of the most enduring achievements of Indian civilization is undoubtedly its architecture. **The Mauryan architecture:**The Mauryan architecture was influenced by the Persian and the Greek architecture. The Stupas of Sanchi and Sarnath are symbols of achievement of Mauryan architecture. The Sanchi Stupa depicted the Jataka stories. The beautiful sculptures were skillfully and aesthetically sculpted by the artisans. The lion capital of the Sarnath pillar is accepted as the emblem of the Indian Republic.

2.How did Gandhara style emerge and what are the characteristics of the Gandhara style/

Asoka's reign (268-232 BC): It showed significant advancement in the field of architecture. Many monolithic stone pillars were erected on which teachings of 'Dhamma' were inscribed. The pillars are unique and remarkable for its animal figures. Gandhara art was developed during this period which was a blend of Greek and Indian art. Mathura school and Amaravathi School were famous for its indigenous art and architecture. Under the influence of Kushana's a large number of life like statues of Buddha and Bodhisattvas were built similar to that of Greek Gods.

3.Compare the architecture of Ashoka and Mauryan ages

Answers 1 & 2 mixed together

4. What is stupa? What is Jataka story?

A **stūpa** is a mound-like or hemispherical structure containing relics (such as *śarīra* – typically the remains of Buddhist monks or nuns) that is used as a place of meditation.[2] A related architectural term is a chaitya, which is a prayer hall or temple containing a stupa

The **Jataka Tales** deal with the many lives of the Buddha before he was born as prince Siddhartha. Composed between 400 and 200 B.C., it's a series of fables that reflect the Buddhist "Middle Way." **Stories**, more than discourse, can communicate grander **themes** in a lasting and effective manner.

The Satavahanas: The Satavahanas of the Andhra region developed Amaravati School. A great Stupa was built at Amaravati whose walls were adorned with bas-relief, carved

5. Explain the cave and rock-cut architecture.

Cave Architecture (2 BC- 10 AD):

Famous among the thousand caves that have been excavated were the Ajanta and Ellora caves of Maharashtra and the Udayagiri caves of Odisha. These caves have Buddhist Mandapas and pillared temples of Hindu Gods.

Rock-Cut Temples:

The earliest rock-cut temples were built in western Deccan which was hewn out of huge rocks. The Kailash temple at Ellora built by the Rashtrakutas, the Ratha temples of Mahabalipuram built by the Pallavas and the Karle caves are the examples of Rock-cut temples. The stability and permanence of rocks was the reason behind the artisans choosing to build temples.

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7. What are the differences between Dravida style and nagara style?

Difference between Dravida and Nagara style of architecture

Basis	Dravida style of architecture	Nagara style of architecture
Location	According to the Silpasastras, those temples which are situated between the Krishna River and Kanyakumari are Dravida style.	According to the Silpasastras, north Indian temples are Nagara style.
Central Tower	It has pyramidical shaped central tower (called Vimana in Dravida style). In this style, there is only one single Shikhara or Vimana.	It is characterized by a beehive shaped curvilinear tower (called a Shikhara, in northern terminology) made up of layer upon layer of architectural elements and a cruciform ground plan. In this style, there is a multiple Shikharas.
Gopuram	Gopuram is the most prominent. It is stylized and big in size.	In Nagara style, the Shikhara remains the most prominent element of the temple and the gateway is usually modest or even absent.
Boundary	In this style, temples have elaborated boundary.	In this style, boundary has less emphasised.
Entrance	In this style, Dwarpalas are there on the entrance.	In this style, Ganga and Yamuna rivers are depicted in personified form at the entrance of Garbhagriha or sanctum sanctorum.
Tower	In this style, there is always a single tower.	In this style, there are multiple towers. For example- Khajuraho temple.
Pedestal	In this style, pedestals are more or less at ground level.	In this style, pedestals are higher than ground.

Deities on the outside	In this style, temples have deities outside.	In this style, temples have deities inside.
Purpose	Temples in South have not only been religious centres, but were also used for administrative activities,	Most of the temples in Nagara style had only religious

8**. Name some major dynasties of South India**

10. Write about Free standing temples.

Free-standing Temples:

In southern India the Pallavas, Cholas, Pandians, Hoysalas and the rulers of Vijayanagara kingdom were great builders of temples. Chola's developed a typical style of temple architecture of South India called the Dravida style, with Vimana or Shikara, High walls and the gateway topped by a Gopura. in northern and Eastern India magnificent temples were constructed as well, which is referred to as Nagara style. Free standing Hindu temples marked the beginning of the Gupta period. The temples at Deogarh and at Bhitargaon are the examples of Gupta period.The Sun temple in Konark, Odisha, Khajuraho in Madhya Pradesh, Mount Abu in Rajasthan, the Somnath in Gujarat, the Kashi Viswanath temple in Varanasi are some of the important temples which bear testimony to Indian Architecture.

9. Write an essay on the ancient architecture of India.

Full essay briefly.

UNIT III

1. Enumerate briefly the history of Blue Jeans

The name comes from serge de Nimes, a city in Southern France. Originally it was made from wool and cotton. Only later it was made solely from cotton. Levi Strauss, an enterprising immigrant recognized a need for strong work pants for the mining worker of California. He first designed and marketed' Levis' in 1850. A tailor named Jacob Davis invented riveted pants to hold the mining tools. Subsequently Davis granted strauss to use his rivet idea which was patented in 1873.

2. What was the steps denim went through before being used as pants?

Manufacturing Denim Cloth: This is done in three stages

1. **Preparing the cotton yarn:** The ginned cotton (picked from fields and processed) is inspected before carding. In this process the cotton is put through machines that contain brushes (cards) with bent wire teeth. These cards clean disentangle, straighten and gather the cotton fibres, which are now called slivers. Other machines join, pull and twist this slivers which make the threads stronger. Next they are put on spinning machines for further twisting and stretching the fibres to form yarn.
2. **Dyeing the yarn:** Denim is usually dyed with chemically synthesized indigo before weaving. Ball warps (large balls of yarn)s are dipped in the indigo mixture several times and is then slashed (starched).This makes the threads stronger and stiffer .Now the yarn threads are ready to be woven.
3. **Weaving the yarn:** The yarn is woven on large mechanical looms. The blue dyed (long and vertical) threads are combined with white (short and horizontal) threads. In this weaving the blue colour dominates. At this point the denim is ready for finishing. The cloth is brushed to remove lint and pre-shrunk after three washings.

3. List out the raw materials required in the making of Blue Jeans.

Raw Materials: True blue jeans are made of 100 percent cottonincluding the threads used for stitching them. the most common dye used being synthetic indigo. The belt loops, waistband, back panel, pockets and leggings are all made of indigo-dyed denim.Other features include the zipper, the buttons, the rivets and the label.Rivets are traditionally made of copper, but the zipper and the buttons are usually steel. Designers' labels are often tags made out of cloth, leathr, or plastic, while others are embroidered on with cotton thread.

4. What is carding and slashing? Why it is done?

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5. **Describe the process involved in preparing the cotton yarn required for making the Blue Jeans.**

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Making blue jeans: The patterns from the design are cut with high-speed cutting machines from. The denim is ready to be sewn at this point. It is done in assembly-line fashion with human operated sewing machines. Different workers are assigned specific functions from attaching the pockets, securing the belt loop, stitching the buttons and zipper to hemming. Finally the makers label is sewn.

6.Explain the process of dyeing and weaving the yarn.

Dyeing the yarn: Denim is usually dyed with chemically synthesized indigo before weaving. Ball warps (large balls of yarn)s are dipped in the indigo mixture several times and is then slashed (starched).This makes the threads stronger and stiffer .Now the yarn threads are ready to be woven.

Weaving the yarn: The yarn is woven on large mechanical looms. The blue dyed (long and vertical) threads are combined with white (short and horizontal) threads. In this weaving the blue colour dominates. At this point the denim is ready for finishing. The cloth is brushed to remove lint and pre-shrunk after three washings.

7. **What is the difference between pre-washing and stone-washing?**

Pre-washing & Stone-washing: Some jeans are pre-washed and some are stone-washed to change the appearance or texture of the finished jeans. Pre-washing involves washing the jeans in industrial detergent to soften the denim. Stone-washing involves washing the jeans but pumice is added to the load resulting in a faded appearance. Small stones produce an even abrasion, while large stones produce a more uneven appearance. Blue jeans are inspected after the completion for correction. They are sent back for re-sewing. There it is re-inspected and passed.

UNIT IV

1. Define how the influx of plans & products of the Weight Loss industry influence the eating habits?

Modern life styles often cause weight gain and obesity, leading to an influx of weight loss plans and products into the market. The weight loss industry is a very large, profitable and growing industry. It is widely accepted that weight gain or loss depends on the food intake and exercise. To brief, weight change occurs due to consuming calories and calories used. Healthy eating habits help the human beings to lead a healthy and happy life. The following form the bricks of a "Healthy Eating Pyramid:"

2. Compare the connection between whole grains and insulin?

Whole Grains:

Healthy carbohydrates take longer for the body to digest. Whole grains help to prevent any sudden rise and fall of blood sugar levels and insulin in the body. Healthy carbohydrates help to prevent "type 2" diabetes and heart diseases. Whole grains are placed at the base of the food pyramid due to benefits of healthy carbohydrates. A few sources of healthy carbohydrates are brown rice, oatmeal and whole-wheat bread.

3. Interpret how do whole grains, healthy fats & oils appear close to the base of the Food Pyramid?

Whole Grains:

Whole grains help to prevent any sudden rise and fall of blood sugar levels and insulin in the body. Healthy carbohydrates help to prevent "type 2" diabetes and heart diseases. Whole grains are placed at the base of the food pyramid due to benefits of healthy carbohydrates. A few sources of healthy carbohydrates are brown rice, oatmeal and whole-wheat bread.

Healthy fats and oils:

"Fats and Oils" occupy the next level in the food pyramid. There is myth that all fats should be avoided to be healthy. But, some fats are healthy and required for a balanced diet. They help to control cholesterol and prevent heart diseases. Healthy fats can be found in Olives, nuts, seeds, Sunflower, Peanuts and fatty fish (such as, Salmon).

4. Express in brief how fish, poultry, eggs & diary help to maintain the health.

Fish Poultry and Eggs:

The next level in food pyramid occupies "Fish, Poultry and Eggs." Fish is an important source of protein and is rich in Omega-3 fatty-acids, which can prevent heart disease. Unsaturated fats are good for health. Chicken and Turkey are low in saturated fats compared to other types of red

meats. Eggs provide good protein and are good supplement to breakfast. However, in case of heart disease and diabetes, yolk of the egg should be avoided strictly.

Dairy:

"Milk and Milk products" occupy the next level in the food pyramid. Milk is rich in Calcium and Vitamin D. Normal intake of milk is sufficient for human beings. Along with milk there are many other sources to get vitamin D such as Sunlight.

5. Distinguish how do red meats, processed meats & butter affect the health

Red meat, and processed meats like bacon and sausages contain hight levels of sodium. They increase the risk of diabetes, heart diseases and colon cancer. Switching to fish, chicken, nuts and beans is a much healthier choice. Similarly, switching from butter to olive oil is also a healthier option. Processed food items contain high levels of Sodium and Glucose which can cause imbalance in the health. Unsaturated fats are good for health. Chicken and Turkey are low in saturated fats compared to other types of red meats.

6. **Associate how refined grains, sugary drinks, sweets and salts have a negative effect on health?**

Refined grains include white bread, rice and pasta. Potatoes too fall into this category of foods that should be eaten sparingly. These items are high in sodium and increase the risk of heart diseases and result in weight gain. This is because refined grains and sugary drinks cause an accelerated increase in blood sugar levels whole grains like wheat and brown rice cause a more gradual increase in blood sugar. Foods that are rich in salt like potato chips, cheese and sauces contain high sodium levels that may lead to heart attack and stroke**.**

7. **State how fruits and vegetables provide benefit for a human being.**

Fruits and Vegetables:

The next group of food items above the fats and oils in the food pyramid are "fruits and vegetables," contain innumerable benefits. It can decrease chances of heart attacks or stroke, possibly protect against some types of cancers, lower blood pressure, helps to avoid painful intestinal ailment called diverticulitis and guards against cataract and macular degeration.the major causes of vision loss amongst people over the age of 65.

UNIT V

1. Explain in brief how Zhou Qunfei, from a humble beginning grew to be a billionaire.

Zhou Qunfei was born in a tiny village in China. She was the youngest of the three children in her family. She lost her mother when she was five. Her father was a skilled craftsman as he lost his eye-sight and a finger in an industrial accident. She helped her family raise pigs and ducks for their livelihood. She is remarkable for her neatness of appearance, her round, owl-like glasses and her cherubic face.

Despite being a brilliant student, Qunfei dropped out of school at the age of 16. She landed a job that required her to work from 8am to 12pm, polishing glass. The whole hours spent were very long, and monotonous and she fed up with working hours. After three months, she firmly decided to quit the job but her boss got impressed with the letter and promoted her too.

2. Enumerate where is Zhou Qunfei 'most at home'? What does it mean to 'be most at home'?

In the factory, glass is cut, ground down to size, bored and polished to give each plate a transparent finish. Then the plates are strengthened in a potassium ion bath, painted and cured. Finally, they are cleaned and coated with anti-smudge and anti-reflection films. Zhou is obsessive about the standards maintained in her factory. From her office, door leads to an apartment. She uses this apartment to rest, so that she can have access to the factory floor day and night.

Zhou Qunfei, the world's richest self-made woman was the founder of Lens Technology and attributes herself success to perseverance. She counts a $27 million estate in Hong Kong among her acquisitions. But she is at most at home on the floor of her factory.

3. Discuss what was the job Zhou Qunfei has taken up & why did she resign & to what outcome?

Zhou Qunfei has taken up a job that required her to work from 8am to 12pm, polishing glass. The whole hours spent were very long, and monotonous and she fed up with working hours. After three months, she firmly decided to quit the job but her boss got impressed with the letter and promoted her too.

4. Describe what was Zhou Qunfei's first business endeavor?

When Zhou Qunfei had saved enough money, she took the help of her relatives and set up a workshop for making watch lenses. Much of what she knew about making lenses was self-taught. She began to work out different ways of improving the quality of the lenses. She began to acquire a reputation for making the finest watch lens available in the market.

Today, there are several competitors in this area, but Lens Technology still remains a tier-one player. Ms. Zhou is very hands-on with her job. She still tours the factory floor and sits down at the machines to work them herself. This is her way of finding any faults in the process or equipment that are in use.

5. Identify why Motorola approached Lens Technology and not any other lens maker?

The advent of mobile phone made her a billionaire. In 2003, she received a call from the mobile giant Motorola. They wanted her to make screens for mobile phones. Until them mobile screens for were made of plastic. But glass would be more resistant to scratches and provide sharper images for texts and multimedia. As the work and the material used by Lens Technology was of good quality, Motorola approached Lens Soon, HTC, Nokia and Samsung placed orders with her. Then, in 2007, Apple entered the market with the iPhone, which is a keyboard-enabled glass touch screen. Within five years, she set up manufacturing plants in three cities.

6. Sketch how the advent of mobile phone made Zhou Qunfei a billionaire?

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Soon, HTC, Nokia and Samsung placed orders with her. Then, in 2007, Apple entered the market with the iPhone, which is a keyboard-enabled glass touch screen. Within five years, she set up manufacturing plants in three cities.

7. Summarize in your own words how and what made Zhou Qunfei, a successful self-made business woman.

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When Zhou Qunfei had saved enough money, she took the help of her relatives and set up a workshop for making watch lenses. Much of what she knew about making lenses was self-taught. She began to work out different ways of improving the quality of the lenses. She began to acquire a reputation for making the finest watch lens available in the market.

She is a fastidious woman who is observant of the smallest details.She attributes herself success to perseverance. She remembers where she comes from and does not take her present position for granted. She is a role model and a source of inspiration for all the women. Zhou chose to work and run a business. And it is a choice she never regrets.