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A COMPARATIVE STUDY BETWEEN पञ्चाङ्ग AND CALENDAR

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Abstract:

This research delves into the concept of 'संवत्सर,' the chronological measure of life in the material universe. Etymologically derived from सम्and वत्सरन्symbolizing the cyclical flow of seasons, scholars posit that a संवत्सर is completed when Earth orbits the Sun. The 365-day duration is intricately divided using two primary methods. The पञ्चाङ्ग is widely based on the concept of ज्योततष which is a component of the Six वेदाङ्ग, encompasses ततति, वार, नक्षत्र, योग, and करण. This calendar system is widely adopted in various Indian and non-Indian countries. The research aims to present a comparative analysis in between पञ्चाङ्ग and Calendar in the terms of forthcoming months, weeks, Constellations and seasons, shedding light on its significance.

Introduction:

Our solar system is home to several celestial bodies, but Earth stands out as the only planet known to support life. Time measurement was developed to keep up with the cycle of birth and death that governs human life. It is essential to note In the Indian Subcontinent, primarily, time in terms of month and year was measured in two ways.

1. **पञ्चाङ्ग (पञ्च+अङ्ग):** is a time measurement system in Hindu culture that has its roots in षड् वेदाङ्ग named as ज्योतिष It comprises five components Tithi, Var, Nakshatra, Yoga, and Karana.
2. **Calendar:**

   The calendar is a time measurement system from Western countries. The term's etymology can be traced back to the Latin word Kalendae, which evolved and is now commonly known as the calendar or Dindarshika in Marathi.

   The Panchang and calendar systems differ in their use, with the former being an ancient Hindu astrological calendar utilized for religious ceremonies, while the latter divides time equally. A comparative analysis of these systems can help deepen our understanding of time measurement across diverse cultures through factors like year, constellations, months, Paksha, days, and tithi. Let's explore how solar and lunisolar calendars are utilized to schedule significant events in life.

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1. Year (संवत्सरम्):

Both "year" and "संवत्सर" (Sanvatsara) are units of time, but they are associated with different calendar systems and have distinct meanings. The Gregorian calendar measures a year as approximately 365.25 days long, while a संवत्सर represents a cycle of time in the Hindu lunar-solar calendar, which is based on lunar months and involves adjustments to synchronize with the solar year. The underlying astronomical principles and specific cultural and religious traditions of each concept differ.

The origin of the Hindu or Indian Calendar can be traced back to King Chastana, who introduced it 78 years after the Julian calendar. He used the Brahmi script to mint a coin on which the year was mentioned. King Chastana was the first emperor of the Shaka Dynasty.

The Gregorian calendar and the Hindu calendar are two distinct calendar systems with different meanings. The Gregorian calendar measures a year as approximately 365.25 days long, while a संवत्सर represents a cycle of time in the Hindu lunar-solar calendar, which is based on lunar months and involves adjustments to synchronize with the solar year. Each concept's underlying astronomical principles and specific cultural and religious traditions differ.

The origin of the Hindu calendar, or Indian calendar, can be traced back to King Chastana, who introduced it 78 years after the Julian calendar. He used the Brahmi script to mint a coin on which the year was mentioned. King Chastana was the first emperor of the Shaka Dynasty.

The Gregorian calendar's leap year is an adjustment to compensate for the slight discrepancy between the solar and calendar years. This discrepancy is caused by the fact that the Earth takes 365.2422 days to orbit the Sun, but the Gregorian calendar assumes that the year is 365.25 days long. The extra day in a leap year is added to February to keep the calendar in sync with the solar year.

The Hindu calendar's अधिक मास, or intercalary month, is also an astronomical event that occurs approximately every 32 months. This month is added to the lunar calendar to bring it back in sync with the solar year. The अधिक मास is not a leap year, as it does not occur every four years.

The Gregorian and Hindu calendars are important cultural and religious traditions used for centuries to mark the passage of time. While their underlying astronomical principles and specific cultural and religious traditions differ, both calendars allow people to organize their lives and mark important events.

2. Months (मासाः):

Divining a year into 12 months is a cultural and historical practice rooted in various ancient calendars, particularly the lunar calendar. A lunar month is the time for the moon to complete one cycle of phases, around 29.5 days. To align the lunar calendar with the solar year, some cultures created a calendar with 12 months.

The Roman calendar initially had ten months but was later modified to align with the solar year. January and February were added to the beginning of the calendar while maintaining alignment with the lunar phases. Despite the evolution and adjustment of the calendar system, the 12-month structure has been

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maintained in many modern calendars, including the widely used Gregorian calendar, which has its months named after ancient Roman culture.

- January: Named after Janus, the Roman god of beginnings and transitions.
- February: Named after the Roman festival "February."
- March: Named after Mars, the Roman god of war.
- April: The origin of the name is uncertain; it possibly refers to the blossoming of flowers and trees.
- May: Named after Maia, the Roman goddess of growing plants.
- June: Named after Juno, the Roman goddess of marriage and women's well-being.
- July: Originally called Quintilis, renamed in honor of Julius Caesar.
- August: Originally called Sextilis, renamed in honor of Augustus Caesar.
- September: Named after "septem," meaning "seven" in Latin.
- October: Named after "octo," meaning "eight" in Latin.
- November: Named after "novem," meaning "nine" in Latin.
- December: Named after "decem," meaning "ten" in Latin.

The unequal division of days among the months is due to historical adjustments to align the calendar with the solar year. Initially, the Romans used a lunar calendar with ten months, totaling about 304 days. Additional days were added to certain months to account for the roughly 365.25 days of the solar year. As a result, the distribution of days among the months became unequal, with months ranging from 28 to 31 days. These adjustments were made to better synchronize the calendar with the seasons and agricultural cycles.

3. Constellations (नक्षत्राणि) :

Constellations are groups of stars in the sky that form recognizable patterns. These patterns appear at different times due to Earth's rotation around the Sun. Consequently, different constellations become visible at different times of the year. The Sun, Moon, and Earth positions determine the moon phases we see. The moon's phases repeat in a 28-day cycle due to the relative positions of these celestial bodies. Since the Earth completes one rotation in 24 hours, it covers 360 degrees. This means that each zodiac is 30 degrees, and each constellation is 13.33 degrees. There are 27 constellations in the sky. While the Sun is rotating around the Sun, it covers one zodiac in one month. This implies that the Sun covers 2.25 constellations in a month. On the other hand, the moon covers one constellation in a day. Let me rephrase the text to make it clearer and correct any errors:

To better understand a concept, let's take an example. Today's date is January 6th, and the Sun is currently in the zodiac sign of Capricorn, which originates from the constellation of Capricornus, the goat. This spans from the 270th to the 300th degree of the zodiac, corresponding to celestial longitude. According to the tropical zodiac, the moon is currently in the constellation of Swati.

The Indian calendar follows the lunisolar system, but the Marathi months are based solely on the moon. Each month begins with चैत्र and ends with फाल्गुन. The moon takes around 29 days to complete one rotation

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around the Earth, while there are 27 constellations. Every month varies between 30 to 31 days, and the moon covers one constellation in a day. Our ancestor's thoughts are based on the Shaka calendar, which begins with a new moon day. The month's name is determined by the constellation in which the moon is located when it transforms into a full moon day. For instance, Gudi Padwa is celebrated on April 9th, and the constellations for that day are Revati and Ashwini. The Full Moon Day falls on April 23rd, and the constellation for that day is Chaitra.

Name of the Months (2024-2025)	Name of the constellation	Dates according to this count
चैत्र	चित्रा	23rd April
वैशाख	विशाखा	23rd may
जेष्ठ	जेष्ठा	22nd June
आषाढ	पूर्वाशाढा	21st July
श्रावण	श्रवण	19th Augst
भाद्रपद	पूर्वा भाद्रपदा	18th September
अश्विन	अश्विनी	17th October
कार्तिक	कृत्तिका	15th November
मार्गशीर्ष	मृगशीर्ष	15th December
पौष	पुष्य	14th January
माघ	मघा	12th February
फाल्गुन	पूर्वा फाल्गुनी	14th March

4. पक्ष:

The Hindu calendar divides each month into two parts, known as Paksha. The first part is called Krishna Paksha, which begins with Pratipada and ends with Purnima. The second part is Shukla Paksha, which starts with Pratipada and ends with Amavasya.

There are two types of calendars that people refer to. The first one is the Shaka calendar, which is an Amavasyant calendar. This means that the new month starts with Krishna Paksha. The second one is the Vikram calendar, which is a Purnimant calendar. This means that the new month starts with Shukla Paksha.

For instance, some states like Maharashtra and southern states follow the Shaka calendar. Their new year (Gudi Padwa) starts the day after Amavasya. On the other hand, northern states follow the Vikram calendar, which starts the day after Purnima. Due to this, these people are 15 days ahead of the festivals.

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This concept is not present in the Gregorian calendar as it does not divide the month into two parts like the Hindu calendar.

5. Days (वासरः):

There are seven days a week and at least 4 to 5 weeks a month.

The origin of the seven-day week can be traced back to ancient Babylon. Around the 6th or 7th century BCE, the Babylonians followed a seven-day cycle linked to the seven classical planets. These planets were visible to the naked eye at that time. Each day of the week was named after one of these planets. Greek also followed the same order, and Gregorian calendars were derived from the Chaldean order.

According to the पञ्चाङ्ग, a new day starts when the Sun rises. The week's chronology determines the position of the Sun next to a planet. For example, after Sunday, the Sun rises next to the moon and stays in that position for an hour. Then, it moves to the next planet in the sequence, ultimately covering all seven planets in 24 hours, repeating the cycle repeatedly.

Chaldean order. पञ्चाङ्ग (based on the position of the rising sun)

शनी	रवी
गुरु	सोम
मंगल	मंगल
सूर्य	बुध
शुक्र	गुरु
बुध	शुक्र
सोम	शनी

Days of the week have origins in mythology, religion, and celestial bodies. The names and their origins are according to the Gregorian and Hindu calendars, which are given below.

- Sunday: Named after the Sun.
- Monday: Named after the Moon.
- Tuesday: Named after the Norse god Tyr.
- Wednesday: Named after the Norse god Odin.
- Thursday: Named after the Norse god Thor.
- Friday: Named after the Norse goddess Frigg.
- Saturday: Named after the Roman god Saturn.

These names have evolved over centuries, influenced by the beliefs of different cultures. The seven-day week we use today comes from Roman, Norse, and other traditions. Hindu culture associates each day of the week with a specific planet or god, believed to impact activities. Here are the Hindu weekdays and their reasons:

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- Sunday(रविवासरः): dedicated to Sun god Surya
- Monday(सोमवासरः): associated with the moon
- Tuesday(मङ्गलवासरः): dedicated to planet Mars
- Wednesday(बुधवासरः): associated with planet Mercury
- Thursday(गुरुवासरः): dedicated to guru Bṛhaspati
- Friday(शुक्रवासरः): associated with planet Venus
- Saturday(शनिवासरः): dedicated to the planet Saturn

These associations have significance in Hindu astrology, and people often choose specific days for performing certain rituals based on them.

6. तिथि:

In the Hindu calendar, the concept of "paksha" is important, which includes "tithi" or lunar day. Each Paksha consists of 15 tithis and two pakshas in a month. This concept is based on the rotation of the moon. The first fortnight starts with "pratipada" (the first day after the new moon day) and ends with "Purnima" (the full moon day), while the second fortnight starts with "pratipada" (the first day after the full moon day) and ends with "amavasya" (new moon day).

On the other hand, the Gregorian calendar is based on the rotation of the Sun. A day in the Gregorian calendar lasts 24 hours, based on the Earth's rotation. However, the Hindu calendar is lunisolar, which means that a day is counted based on the time of the Sun rising. Conversely, tithi is based on the moon's rotation, so the duration of each tithi can vary. Therefore, this concept is unique to the Hindu calendar. A day in the Hindu calendar starts at midnight and ends at 11:59 pm, but tithi is not based on hours, and there are no exact hours in one tithi.

Conclusion:

A calendar is a tool used to measure time and organize daily activities. The system divides time into days, weeks, and months. There are two types of calendars: solar-based and lunar-based. The solar calendar is based on the movement of the Sun and provides a uniform measure of time. It is used worldwide for civil and administrative purposes. The Gregorian calendar is the most widely used solar-based calendar today. It was introduced by Pope Gregory XIII in 1582 to replace the Julian calendar. On the other hand, the lunar calendar is based on the moon's cycles and is used for religious and cultural events. It is widely used in many countries.

Presently, people use both calendars simultaneously for various purposes. However, these calendars have limitations. The solar calendar does not consider the moon's phases, while the lunar calendar does not provide a uniform measure of time. Therefore, a hybrid calendar that combines the Shaka and Gregorian calendars would be wise to consider. The Shaka calendar is a lunar-solar-based calendar widely used in India. It is based on the moon's movement and is divided into years, constellation months, Paksha, weeks, and this. The Gregorian calendar, on the other hand, is widely used in the Western world. It is based on the movement of the Sun and is divided into months, weeks, and days. A hybrid calendar that combines the best of both worlds would be ideal.

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This would be a combination of tradition and modern administration. The hybrid calendar would consider the moon's phases and provide a uniform measure of time. It would be useful for civil and religious purposes and help people organize their time and plan their activities more efficiently. In conclusion, a hybrid calendar would be a step towards a more harmonious world where people of different cultures and religions can work together towards a common goal.

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