Civil Engineering Magazine

July – Dec 2021

Tech and Trendz

Contents

Departmental Events
Guest lecture on “Concrete Durability”

Er. K Venkataraman, Ultra Tech Cements, A.P

Sri. R. Ajay Kumar, Ultra Tech Cements, A.P

Dr. V. Ramakrishna, Professor and Head, Department of Civil Engineering, LBRCE addressing the gathering

Event	Guest lecture on “concrete for durability
Date/ duaration	25.12.2021
Resorce person	Er. K Venkataraman, Regional Head - Technical Customer Solutions, Ultra Tech Cements, Andhra Pradesh
Name of the Coordinator	Sri. K. Harish Kumar, Assistant Professor
Outcome of event	This program is helpful for the students to understand the details of every aspect of durability of concrete, the technicalities of construction field and also making them aware of the advancements therein

FDP Program on “Environmental and Water resources modeling and management”

Q&A Session with Resource Person
Dr. M. Chandrasekhar

Resource Person:
Dr. S. Balaprasad

Event	Online Three days FDP program on “Environmental and Water resources modeling and Management”
Date/ duaration	04.6.2021 – 07.06.2021
Resorce person	1. Prof. Vasan Arunachalam, Associate Dean of Academic, BITS Pilani, Hyderabad Campus. 2. Dr. M. Chandrasekhar, Professor, Department of Civil Engineering, NIT Warangal. 3. Dr. S. Bala Prasad, Professor, Department of Civil Engineering, Andhra University, Visakhapatnam.
Name of the Coordinator	Sri. K. Harish Kumar, Assistant Professor
Outcome of event	Will be exposed to the basic concepts on mathematical modelling and optimization with references to a real-world planning problem. Faculty can take up research in local regions and guide/supervise students for dissertation or project work. Learn the fundamental process of air pollution dispersion modeling process. Use of ALOHA model to estimate the chemical concentrations at different receptors

Webinar on a virtual tour of “UltraTech cement”

HOD Dr. V. Ramakrishna addressing event

Presentation of Resource Person

Event	One day on online webinar on virtual tour of India’s largest cement manufacturing plant
Date/ duaration	09-06-2021
Resorce person	Dr. Ram Pant,RCM-Ultra Tech Cement Ltd
Name of the Coordinator	Sri. Eeshwar Ram.J , Assistant Professor
Outcome of event	The virtual industrial visit has given a good exposure to the students with regard to mixing and making of cement, which is an essential requirement of construction of structures at the site.

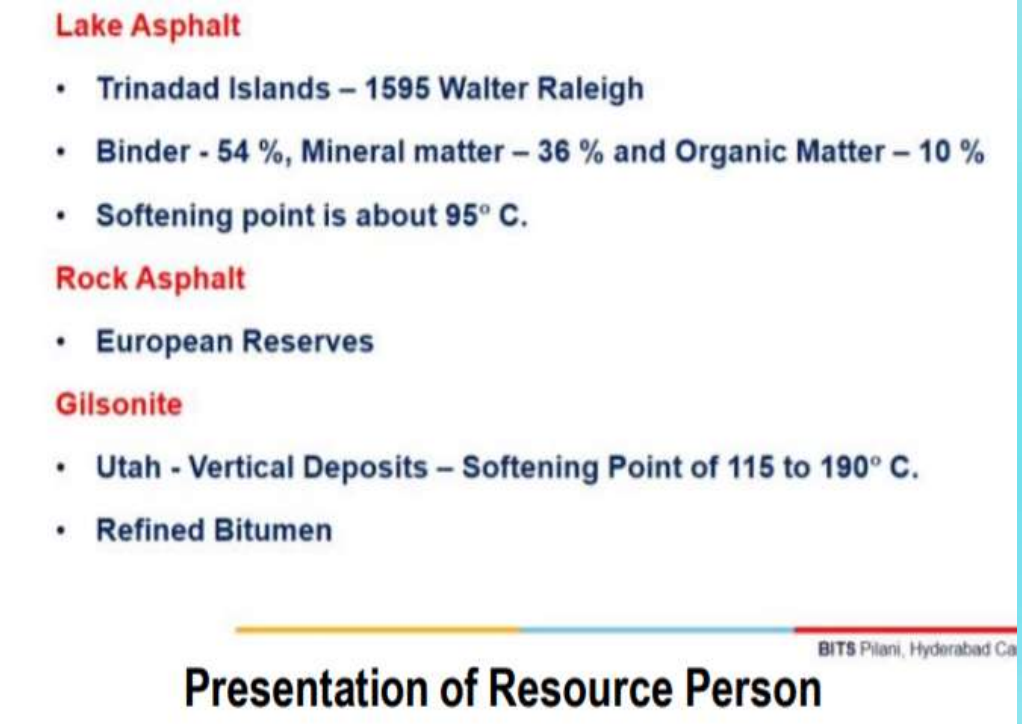
Webinar on “Retrofitting of structural elements”

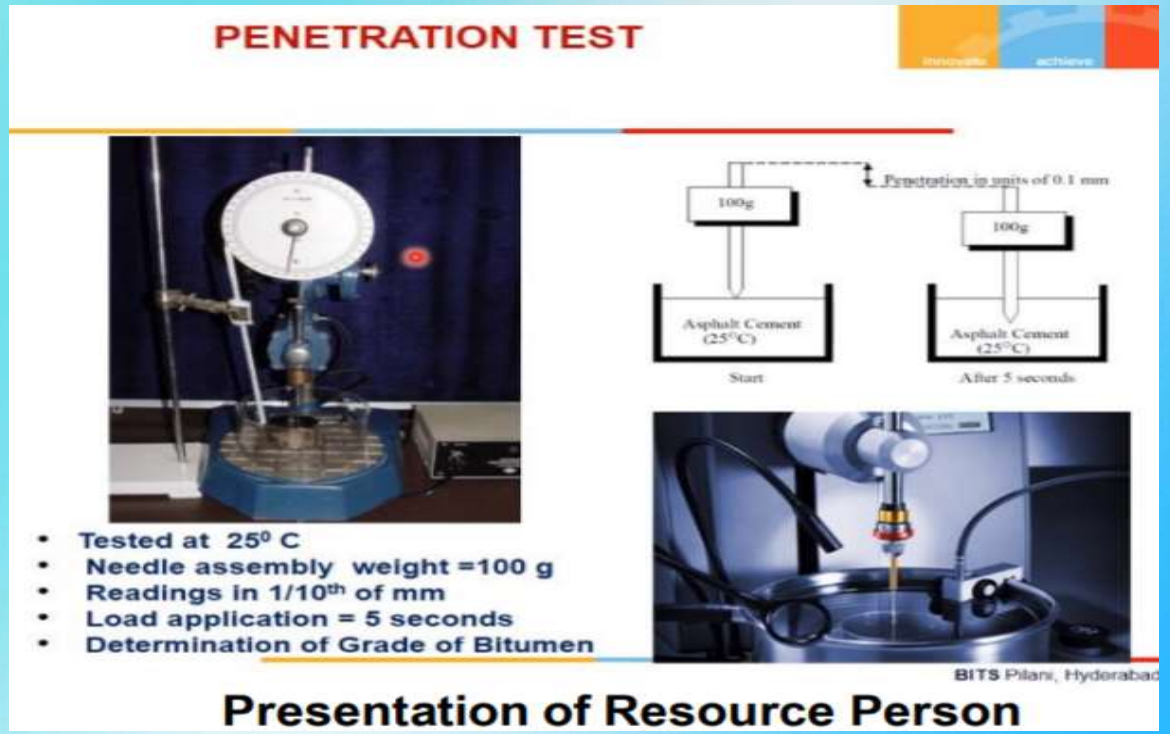
RESOURCE PERSON
Dr P. POLURAJU

Chair Person,
Indian Concrete Institute,
Vijayawada Centre

Event	One day on online webinar on “Rretrofitting of structural elements”
Date/ duaration	10-06-2021
Resource person	Dr P.Poluraju, Professor, K L Deemed to be University
Name of the Coordinator	Sri. B.Rama Krishna , Assistant Professor
Outcome of event	Faculty and other relevant participants can take up research for their Ph.D. works & guide/supervise the students for dissertation or project work

Webinar on “Characteristics of Highway bitumen materials”



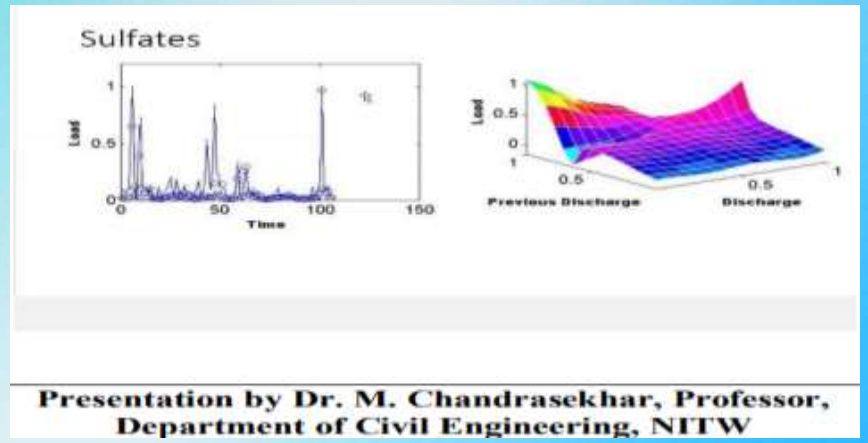


Event	Online webinar on “Highway materials - Bitumen characterization”
Date/ duaration	17-06-2021
Resorce person	Dr V. Vinayaka Ram, Associate Professor, BITS - Pilani, Hyderabad Campus
Name of the Coordinator	P. Mohana Gangaraju, Asst Professor
Outcome of event	Understanding of bitumen characterization along with introduction to advancements

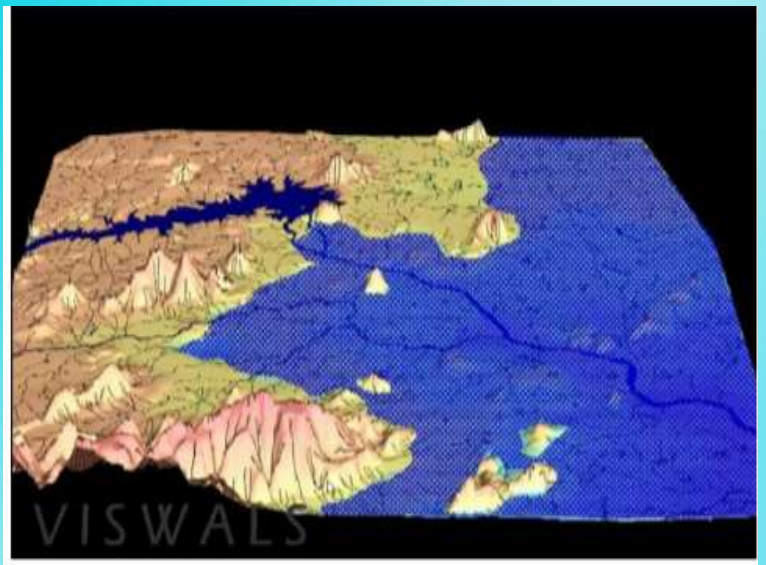
FDP Program on "Environmental and Water resources modeling and Management"

Welcome address by **HOD Dr V. Ramakrishna**

Inaugural address by **Principal Dr K. Appa Rao**



Presentation by Dr. M. Chandrasekhar, Professor, Department of Civil Engineering, NITW



Presentation by Dr. K. B. Chari, Scientist, GIS Labs, Hyderabad

Event	Online two days FDP on "Advanced topics in water resources and Environmental Engineering".
Date/ duaration	01-12-2021 to 02-12-2021
Resorce person	1. Dr.M.Chandrasekhar, Professor, Department of Civil Engineering, NIT Warangal. 2. Dr. K. B. Chari, Scientist, GIS Labs, Hyderabad.
Name of the Coordinator	P. Mohana Gangaraju, Asst Professor. P. Keerthi, Assistant Professor.
Outcome of event	Faculty can take up research in local regions & guide/ supervise students for dissertation or project work. It enables the participants to appreciate the role of geospatial technologies in the risk management and mitigation of disasters

Achievements

Academic achievers

V.Srilatha (9.93/10,1st year 2019-20)
P.Tharaka Lakshmi (9.59/10,2nd year 2020-21)
S.Harika (9.36/10,1st year 2020-21)
K.Siva Satayanarayana (9.1/10,3rd year 2020-2021)

Project-Expo: First prize

B.Yamini (3rd year)
P.Keerthi (3rd year)

Extra-curricular achievements

Running race(200m): Second prize

K.Harika (3rd year)

Cricket: Winners

V.Pujitha(3rd year)
M.Niharika(3rd year)
Y.Shubashini(3rd year)
V.Nanditha(3rd year)
Y.Chandrika(3rd year)
B.L.Lavanya(3rd year)
B.Yamini(3rd year)
P.Dhanya(3rd year)
J.Naveena (3rd year)
A.Swetha (3rd year)
A.Pujitha (2rd yea)
S.Henna Kausar(3rd year)

Placements

S.NO	COMPANY	SELECTED
1	Cognizant Gen C	G.Lakshmi Anuhya, J.Eeswari Pavani Lakshmi, P.Phani Poornima, C.Venkata Naga Sai Surya, K.Madhu
2	TCS	Kota Siva Satya Narayana
3	CSS Corp	S.Deepthi
4	Formonitech	Ch.Naga Sowmya, K.Madhu G. Ranjith Nayak C. Venkata Naga Sai Santhikala

Research Publications

1.Venkateswara Rao.J, Gopi Shankar K "Development of Mix Design and Correlation Studies Between Mechanical Properties of Ternary Blended High Strength Concrete" Lecture Notes in Civil Engineering ISSN : 2366-2565/2366- 2551, Volume -1, Dec(2021), pp 978-981, Published in Scopus Index Journal.

2.B.Narasimha Rao, R.Rajendran, P.Preethi, A.R.Mohammed shais, D.Naveen, R.Prem Anand, S.Narentheran, N.Lingeshwaran and S.Pratheba "Strength Analysis of geo-polymer concrete based on GGBS/rise husk and p-sand" Materials Today Proceedings ISSN : 2214-7853, Volume -47, Issue 15 August(2021), pp 5499- 5502, Published in Scopus Index Journal.

3. J. Rangaiah, V. Mallikarjuna, P.Uday Bhaskar "Water Demand Analysis for Selected Rural Regions in Visakhapatnam District" IOP Conference Series: Earth and Environmental Science ISSN : 1755-1315/1755-1307, Volume -796, Issue August(2021), pp 1 to 11, Published in Scopus Index Journal.

4. K. Harish Kumar, N. Veerendra Babu and N. Lingeshwaran "A study on the repair of concrete structure using non destructive tests" Materials Today Proceedings ISSN: 2214-7853, Volume -47, Issue 15 July(2021), pp 5439-5446, Published in Scopus Index-Journal

5.M.Satyanarayana and N. Lingeshwaran "An experimental study on heat insulation panels & Brick walls" Materials Today Proceedings ISSN: 2214-7853, Volume -47, Issue 15 July(2021), pp 5432-5438, Published in Scopus Index Journal.

6.Dr. V. Ramakrishna, N. Saigiri, K. Chakribabu, Saliha Sultana and M. Dhanunjay "Modeling and Prediction of Traffic Noise Levels" IOSR Journal of Engineering ISSN: 2250-3021, Volume -11, Issue 1, Jan (2021), pp 4 to 13, Published in Scopus Index Journal.

Student article

Burj Khalifa

General information

Status	Completed
Type	Mixed-use
Architectural style	Neo-futurism
Location	Dubai
Country	United Arab Emirates
Construction started	6 January 2004
Completed	1 October 2009
Opened	4 January 2010
Cost	US$1.5 billion

Technical details

Architectural	828 m (2,717 ft)
Tip	829.8 m (2,722 ft)
Top floor	584.5 m (1,918 ft)
Observatory	555.7 m (1,823 ft)
Structural system	Reinforced concrete, steel, and aluminium
Floor count	154 + 9 maintenance
Floor area	309,473 m^2 (3,331,100 sq ft)
Architect	Adrian Smith
Structural engineer	Bill Baker
Main contractor	Samsung C&T

Compiled by
P.Tharaka Lakshmi
(19761A0133)

History

- Burj Khalifa is a very tall skyscraper in Dubai, United Arab Emirates and is the tallest building ever built, at 828 metres (2,717 feet). Before the building opened, it was called Burj Dubai.
- The building is 162 stories high. Construction of the tower was started in 2004. The building was officially opened on 4 January 2010. It is the tallest structure made by humans in the world.
- The building is more than 300 metres (980 feet) taller than Taipei 101. Taipei 101 was the tallest building until 2010 before Burj Khalifa was built.
- It was built by Samsung Engineering & Construction, Besix, and Arabtec. The tower cost US $1.5 billion to build.
- The building is part of a 2 kilometers (1.2 miles) building project on Sheikh Zayed Road, Downtown Burj Khalifa. It is near Dubai's main business district.

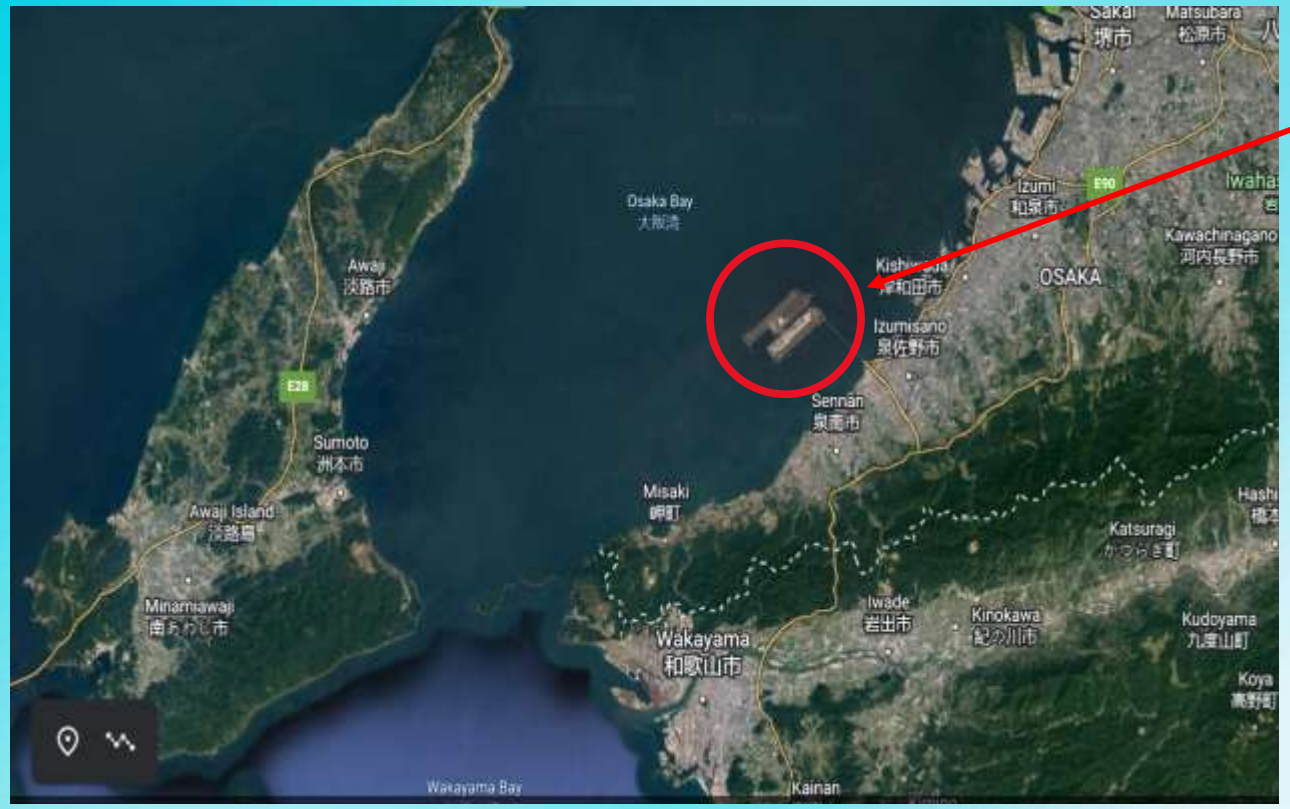
Building and planning

- The main contractor was Samsung C&T of South Korea. They also built the Taipei 101 and Petronas Twin Towers. Other contractors who helped with the building included Belgian group Besix and Arabtec from the UAE.
- The Turner Construction Company was chosen as the construction project manager. The design architect, Adrian Smith, did not like the first design of the upper part of the building.
- He added 27 new floors and an aluminum spire to the top of the plans.
- The design of Burj Khalifa is based on those used in Islamic architecture. Burj Khalifa has been said to have had several other planned height increases since it was first built. This has not been proven to be true yet.
- The TV/radio communications mast was added to the tower's plans in 2007. This was after building work had begun in 2006. There are pressurized, air-conditioned refuge floors about every 35 floors. These were put into the tower in case of an emergency or fire.

- The unusual design and engineering problems of building Burj Khalifa have been shown in many television documentaries. These include the *Big, Bigger, Biggest* series on National Geographic and Five channels, and the *Mega Builders* series on the Discovery Channel.
- The most important building material of Burj Khalifa is reinforced concrete. A special concrete was needed because of the high pressure of the building's weight and the hot local climate of Persian Gulf temperatures that can reach 50 °C (122 °F). Any major cracks could have caused a large amount of damage to the building.
- The foundation of the building is 15 metres (49 feet) deep. It was built with 192 columns being put into the ground. Each column was 1.5 metres (4 feet 11 inches) in diameter and 43 metres (141 feet) long. 55,000 tonnes (121,000,000 pounds) of steel rebar were used in the construction of the tower.
- It took 22 million man-hours to build. A high density, low permeability concrete was used in the foundations of Burj Khalifa. A cathodic protection system is used to lessen any bad effects from corrosive chemicals in local groundwater.
- A fountain system was built outside the tower. It was designed by WET Design of California. They built and planned out the fountains at the Bellagio Hotel Lake in Las Vegas.
- The fountain cost UAE 800 million. It is lit by 6,600 lights and 50 coloured projectors. The fountain is 84 metres (275 feet) long. It shoots water 46 metres (150 feet) into the air to the sounds of classical and modern Arabic and world music. On 26 October 2008, the fountain was named the Dubai Fountain.
- Emaar Properties said on 9 June 2008 that construction of Burj Khalifa was slowed because of changes to finishes. An Emaar official said that the luxury finishes that were decided on in 2004, when the tower was first planned, were being replaced by better finishes.
- The design of the apartments was also made better. This was done to make them both look better and work better. There were problems with the marble decorations, flooring, the top floors' sanitation system, broken glasswork and a poorly done mural of the Sultan of Oman. The new ending date of 2 December 2009, was then given. Burj Khalifa opened on 4 January 2010.

Civil Engineering Marvels

Kansai International Airport



- **Kansai International Airport** is the primary international airport in the Greater Osaka Area of Japan and the closest international airport to the cities of Osaka, Kyoto, and Kobe.
- It is located on an artificial island in the middle of Osaka Bay off the Honshu shore, 38 km (24 mi) southwest of Ōsaka Station, located within three municipalities, including Izumisano (north), Sennan (south), and Tajiri (central), in Osaka Prefecture.

Compiled by
S. Phanindra reddy
(19761A0145)

History

- In the 1960s, when the Kansai region was rapidly losing trade to Tokyo, planners proposed a new airport near Kobe and Osaka.
- The city's original international airport, Itami airport located in the densely populated suburbs of Itami and Toyonaka was surrounded by buildings; it could not be expanded, and many of its neighbours had filed complaints because of noise pollution problems.
- After the protests surrounding New Tokyo International Airport (now Narita international airport), which was built with expropriated land in a rural part of Chiba prefecture, planners decided to build the airport offshore.
- The new airport was part of several new developments to revitalize Osaka, which had been losing economic and cultural ground to Tokyo for most of the century.

Construction

- An artificial island was proposed, 4 km (2+1⁄2 mi) long and 2.5 km (1+1⁄2 mi) wide. Engineers needed to overcome the extremely high risks of earthquakes and typhoons (with storm surges of up to 3 m or 10 ft).
- The water depth is 18 m on top of 20 m of soft Holocene clay which holds 70% water. A million sand drains were built into the clay to remove water and solidify the clay. Construction started in 1987.
- The sea wall was finished in 1989 (made of rock and 48,000 tetrapods). Three mountains were excavated for 21 million cubic meters (27 million cubic yards), and 180 million cubic meters (240 million cubic yards) were used to construct island 1. Over 3 years, 10,000 workers using 80 ships took 10 million.
- In 1990, a three- kilometers bridge was completed to connect the island to the mainland at Rinku Town, for $1 billion. Completion of the artificial island increased the area of Osaka Prefecture just enough so that it is no longer the smallest prefecture in Japan (Kagawa prefecture is now the smallest).

- Prime Minister Yasuhiro Nakasone responded to American concerns, particularly from Senator Frank Murkowski, that bids would be rigged in Japanese companies' favor by providing special offices for prospective international contractors, which ultimately did little to ease the participation of foreign contractors in the bidding process.
- The bidding and construction of the airport was a source of international trade friction during the late 1980s and early 1990s.
- Later, foreign airlines complained that two-thirds of the departure hall counter space had been allocated to Japanese carriers, disproportionately to the actual carriage of passengers through the airport.
- The island had been predicted to sink 5.7 m (18 ft 8 in) by the most optimistic estimate as the weight of the material used for construction compressed the seabed silts. However, by 1999, the island had sunk 8.2 m (26 ft 11 in) – much more than predicted.
- The project became the most expensive civil works project in modern history after twenty years of planning, three years of construction and US$15bn of investment.
- Much of what was learned went into the successful artificial islands in silt deposits for New Kitakyushu Airport, Kobe Airport, and Chūbu Centrair International Airport.
- The lessons of Kansai Airport were also applied in the construction of Hong Kong International Airport.
- In 1991, the terminal construction commenced. To compensate for the sinking of the island, adjustable columns were designed to support the terminal building. These are extended by inserting thick metal plates at their bases.
- Government officials proposed reducing the length of the terminal to cut costs, but architect Renzo Piano insisted on keeping the terminal at its full planned length. The airport was opened on 4 September 1994.
- On 17 January 1995, Japan was struck by the Great Hanshin earthquake, the epicentre of which was about 20 km (12 mi) away from KIX .
- As of 2008, the total cost of Kansai Airport was $20 billion including land reclamation, two runways, terminals, and facilities.

- On 17 January 1995, Japan was struck by the Great Hanshin earthquake, the epicenter of which was about 20 km (12 mi) away from KIX.
- Due to its earthquake engineering, the airport emerged unscathed, mostly due to the use of sliding joints. Even the glass in the windows remained intact.
- On 22 September 1998, the airport survived a typhoon with wind speeds over 60 m/s (130 mph). On 19 April 2001, the airport was one of ten structures given the "Civil Engineering Monument of the Millennium" award by the American Society of Civil Engineers.
- As of 2008, the total cost of Kansai Airport was $20 billion including land reclamation, two runways, terminals, and facilities. Most additional costs were initially due to the island sinking, expected due to the soft soils of Osaka Bay.
- After construction the rate of the sinking was considered so severe that the airport was widely criticized as a geotechnical engineering disaster. The sink rate fell from 50 cm (20 in) per year in 1994 to 7 cm (3 in) per year in 2008.

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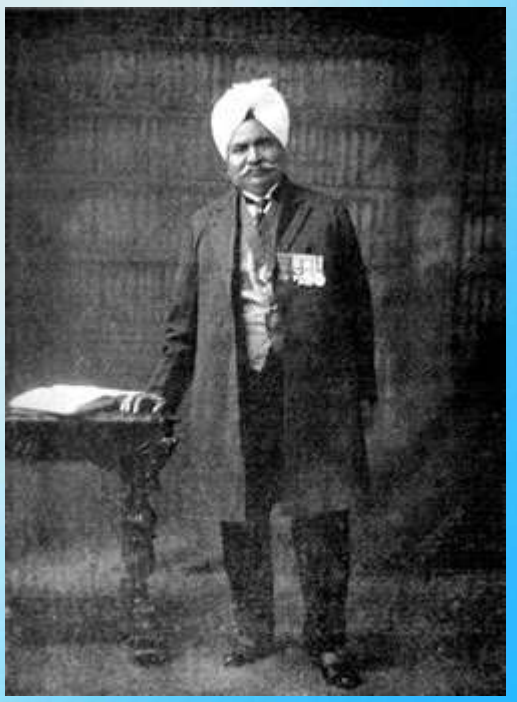
Famous Engineer

Born	13 April 1851 Mangtanwala, Nankana Sahib District, Punjab, British India (now Pakistan)
Died	10 July 1927 (aged 76) London, England



Sir Ganga Ram

Early life:

- Ganga Ram was born on 1851 April 13 in Mangtanwala, a village in the Nankana Sahib District of Punjab Province in British India (now in Pakistan) into a Punjabi Hindu family.
- His father, Doulat Ram, was a junior sub-inspector at a police station in Mangtanwala. Later, he shifted to Amritsar and became a copywriter for the court. Here, Ganga Ram passed his matriculation examination from the Government High School and joined the Government College, Lahore in 1869.

- In 1873, after a brief Service in Punjab P.W.D devoted himself to practical farming.
- He obtained, on lease from the government, 50,000 acres (20,000 ha) of barren, unirrigated land in Montgomery and within three years converted that vast desert into smiling fields, irrigated by water lifted by a hydroelectric plant and running through a thousand miles of irrigation channels, all constructed at his own cost.
- This was the biggest private enterprise of the kind, unknown and unthought-of in the country before. Sir Ganga Ram earned millions most of which he gave to charity.
- In the words of Sir Malcolm Hailey, the Governor of Punjab, “he won like a hero and gave like a Saint”. He was a great engineer and a great philanthropist. He designed and built the General Post Office, Lahore Museum, Aitchison, Mayo School of Arts (now the National College Of Arts), Ganga Ram Hospital, Lahore 1921, Lady Mclagan Girls High School, the chemistry department of the Government College University, the Albert Victor wing of Mayo Hospital, Sir Ganga Ram High School (now Lahore College for Women), the Hailey College of Commerce (now Hailey College of Banking & Finance), Ravi Road House for the Disabled, the Ganga Ram Trust Building on “The Mall" and Lady Maynard Industrial School.
- He also constructed Model Town and Gulberg town, once the best localities of Lahore, the powerhouse at Renala Khurd as well as the railway track between Pathankot and Amritsar.
- After the partition of India and Pakistan, another hospital Sir Ganga Ram Hospital, New Delhi was built in 1951 in his memory.

The Lahore Museum building was designed in the Indian Revival architectural style by Sir Ganga Ram.

Compiled by

P . Sreeja Niveditha

(19761A0129)

Trick Zone

Riddles

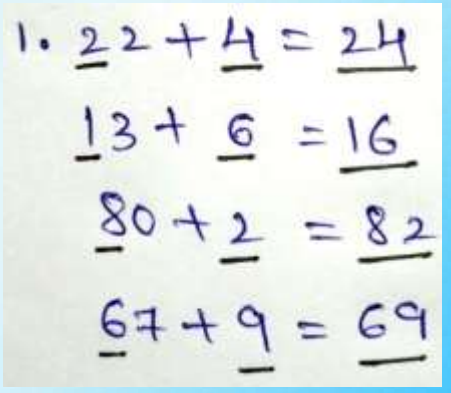
1. What starts with “e” and ends with “e” but only has one letter in it?
2. How can a girl go 25 days without sleep?
3. If it takes eight men ten hours to build a wall, how long would it take four men?
4. If you have a bowl with six apples and you take away four, how many do you have?
5. If you had only one match and entered a dark room containing an oil lamp, some kindling wood, and a newspaper, which would you light first?
6. If you spell “sit in the tub” s-o-a-k, and you spell “a funny story” j-o-k-e, how do you spell “the white of an egg”?

Answers:

1. An envelope
2. She sleeps at night
3. No time, because the wall is already built
4. The four you took
5. The match
6. E-G-G W-H-I-T-E

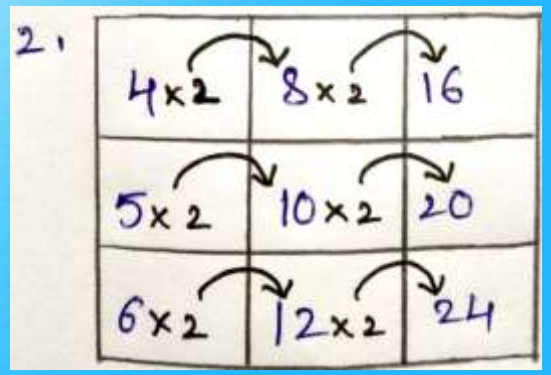
Number Puzzles

1. 22+4 = 24
13+6 = 16
80+2 = 82
67+9 =??



2.

4	8	16
5	10	20
6	12	?

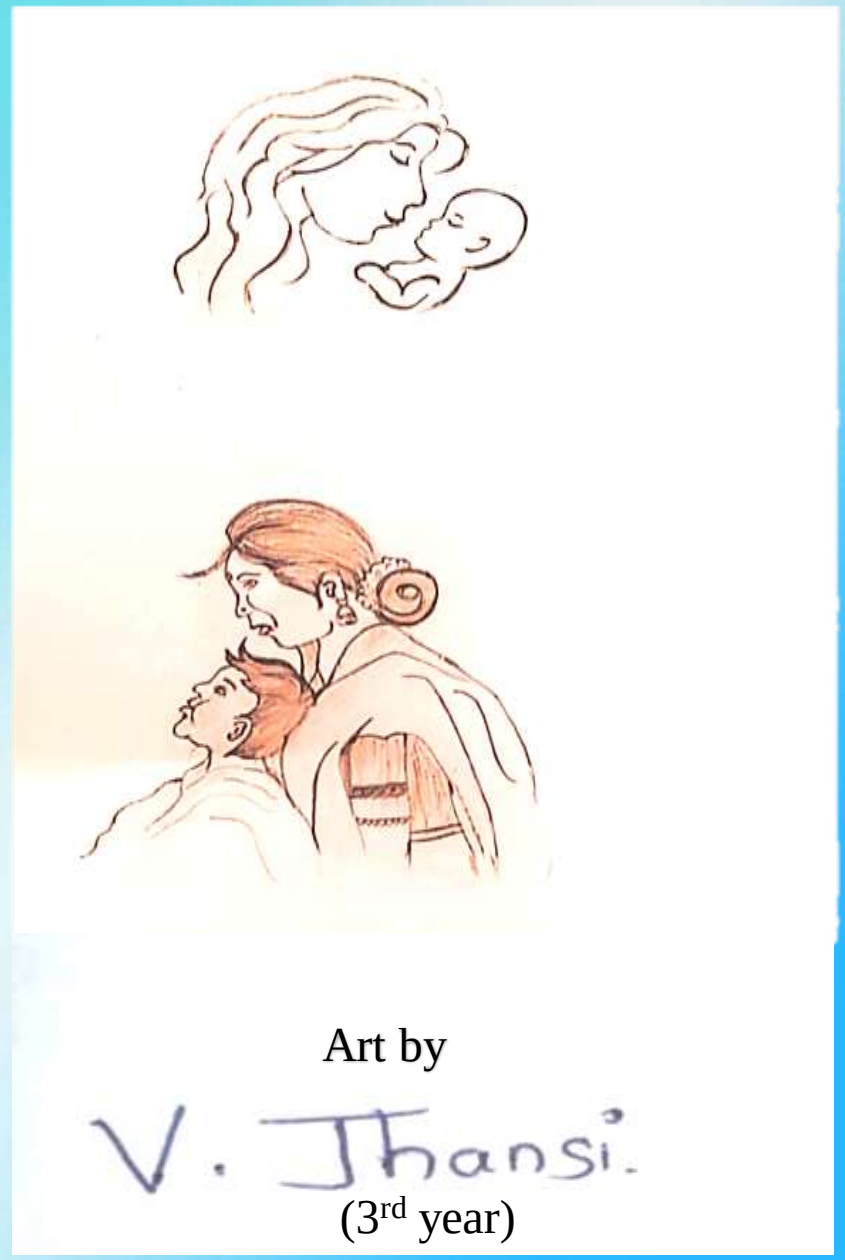


Arts

Art by

P. Tharaka Lakshmi

(3rd year)



Art by

V. Jhansi.

(3rd year)