ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

AN AUTONOMOUS INSTITUTION

(Unit of Alva's Education Foundation (R), Moodbidri)

Shobhavana Campus, MIJAR-574225, Moodbidri, D.K., Karnataka, Affiliated to VTU, Belagavi

Approved by AICTE New Delhi. Recognized by Govt. of Karnataka.

Accredited with 'A+' grade by NAAC & NBA (ECE & CSE)

DEPARTMENT OF CIVIL ENGINEERING

A.Y. 2023 – 24

Course : RAILWAY, HARBOR, TUNNELL & AIRPORTS

Course Code : 21CV643

Semester : VI

Section : A

Faculty Details

Name : SANTHOSH K

Qualification : M.Tech in Structural Engineering

Department : Civil Engineering

Contact Number : 7259724347

Email Id : Santhosh135@aiet.org.in

Specimen Signature :

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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CALENDAR OF EVENTS (B.E. EVEN/ MBA ODD SEMESTER 2023-24)

VISION
"Transformative education by pursuing excellence in Engineering and Management through enhancing skills to meet the evolving needs of the community"

MISSION
• To bestow quality technical education to imbibe knowledge, creativity and ethos to students community.
• To inculcate the best engineering practices through transformative education.
• To develop a knowledgeable individual for a dynamic industrial scenario.
• To inculcate research, entrepreneurial skills and human values in order to cater the needs of the society.

WEEK	MONTH	DAYS							ACTIVITIES
		MON	TUE	WED	THU	FRI	SAT	SUN	
01	JANUARY 2024	1	2	3	4	5	6	7	14: Makara Sankranti 26: Republic Day 30-31: Student Mentoring
02		8	9	10	11	12	13	14	
03		15	16	17	18	19	20	21	
04		22	23	24	25	26	27	28	
05		29	30	31					
06	FEBRUARY 2024				1	2	3	4	7: Commencement of I Semester MBA 12: Commencement of VIII Semester 28-29: Student Mentoring
07		5	6	7	8	9	10	11	
08		12	13	14	15	16	17	18	
09		19	20	21	22	23	24	25	
10		26	27	28	29				
11	MARCH 2024				1	2	3	6: Commencement of II Semester 8: Maha Shivaratri 9: Last Working Day of V Semester 25-26: CIE Test – I for VIII Semester 26-28: CIE Test – I for I Semester MBA 27-28: Student Mentoring 29: Good Friday
12		4	5	6	7	8	9	10	
13		11	12	13	14	15	16	17	
14		18	19	20	21	22	23	24	
15		25	26	27	28	29	30	31	
16	APRIL 2024	1	2	3	4	5	6	7	9: Yugadi 11: Ramadan 15: Commencement of IV Semester 20-24: CIE Test – I for II Semester 20-22: CIE Test – II for VIII Semester 24-26: CIE Test – II for I Semester MBA 29-30: Student Mentoring
17		8	9	10	11	12	13	14	
18		15	16	17	18	19	20	21	
19		22	23	24	25	26	27	28	
20		29	30						
21	MAY 2024			1	2	3	4	5	1: May Day 9-11: CIE Test – III for VIII Semester 10: Basava Jayanthi/ Akshaya Trithiya 11: Last Working Day of VIII Semester 23-25: CIE Test – III for I Semester MBA 24-27: CIE Test – I for IV Semester 29: Last Working Day of I Semester MBA 30-31: Student Mentoring
22		6	7	8	9	10	11	12	
23		13	14	15	16	17	18	19	
24		20	21	22	23	24	25	26	
25		27	28	29	30	31			
26	JUNE 2024						1	2	15-20: CIE Test – II for II Semester 17: Bakrid 22-25: CIE Test – II for IV Semester 27-28: Student Mentoring 29: Last Working Day of II Semester
27		3	4	5	6	7	8	9	
28		10	11	12	13	14	15	16	
29		17	18	19	20	21	22	23	
30		24	25	26	27	28	29	30	
31	JULY 2024	1	2	3	4	5	6	7	17: Muharram 20-23: CIE Test – III for IV Semester 25-26: Student Mentoring 27: Last Working Day of IV Semester
32		8	9	10	11	12	13	14	
33		15	16	17	18	19	20	21	
34		22	23	24	25	26	27	28	

Date: 10/04/2018

Vision Statement of the Institute:

Transformative education by pursuing excellence in Engineering and Management through enhancing skills to meet the evolving needs of the community

Mission Statement of the Institute:

1. To bestow quality technical education to imbibe knowledge, creativity and ethos to students community.

2. To inculcate the best engineering practices through transformative education.

3. To develop a knowledgeable individual for a dynamic industrial scenario.

4. To inculcate research, entrepreneurial skills and human values in order to cater the needs of the society.

Dr. Peter Fernandes

Principal

AIET, Moodbidri

PRINCIPAL

Alva's Institute of Engg. & Technology,

Mijar. MOODBIDRI - 574 225, D.K

Dr. M Mohan Alva

Chairman

AEF, Moodbidri

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
Shobhavana Campus, Mijar, Moodabidri, Mangalore Taluk, D.K – 574225
Phone: 08258-262725, Fax: 08258-262726

ALVA'S
Education Foundation

DEPARTMENT OF CIVIL ENGINEERING

VISION OF THE INSTITUTE

"Transformative education by pursuing excellence in engineering and Management through enhancing skills to meet the evolving needs of the community"

MISSION OF THE INSTITUTE

- To bestow quality technical education to imbibe knowledge, creativity and ethos to students community.
- To inculcate the best engineering practices through transformative education.
- To develop a knowledgeable individual for a dynamic industrial scenario.
- To inculcate research, entrepreneurial skills and human values in order to cater the needs of the society.

VISION OF THE DEPARTMENT

To become a leader in the field of Civil Engineering by imparting quality education in developing highly competent manpower and promote research to meet the current and future challenges in Civil Engineering.

MISSION OF THE DEPARTMENT

- To impart knowledge by creating conducive teaching-learning environment.
- To produce civil engineers of high caliber, technical skills and ethical values, to serve the society.
- To promote innovation in the minds of futureengineers to face the challenges.

DEPARTMENT OF CIVIL ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

- To provide the students a strong foundation in Basic Sciences that will enable them to identify and solve real time problems in Civil engineering for Industries and Research activities.

- To develop abilities and talents, leading to creativity and productivity in professional and industrial field beyond the curriculum and thus enhance the employability skill.

- To explore and apply the modern engineering tools for planning, design, execution and maintenance of works those are technically and economically viable, and socially acceptable.

PROGRAM SPECIFIC OUTCOMES

- **PSO1:** The graduates will be able to plan, analyse, design and execute cost effective Civil engineering structures without over exploitation of natural resources.

- **PSO2:** The graduates will have the ability to take up employment, entrepreneurship, research and development for sustainable civil Society

- **PSO3:** The graduates will be able to pursue opportunities for personal and professional growth, higher studies, demonstrate leadership skills and engage in lifelong learning by active participation in civil engineering profession.

- **PSO4:** The graduates will be able to demonstrate professional integrity and an appreciation of ethical, environmental, regulatory and issues related to civil engineering projects.

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DEPARTMENT OF CIVIL ENGINEERING

TIMETABLE   w.e.f: 29/04/2024

Academic Year	Scheme	Semester	Section	Class Coordinator	Room No
2023-24	2021	VI	A	Ms. Anusha B. Rao	504

DAY \ TIME	9.00 To 9.50	9.50 To 10.40	10.40 To 11.00	11.00 To 11.50	11.50 To 12.40	12.40 To 1.40	1.40 To 2.30	2.30 To 3.20	3.30 To 5.00
MON	CME (VKS)	CT (ABR)	T E A B R E A K	DSS (DPB)	RHTA (SK)	L U N C H B R E A K	CONCRETE TECHNOLOGY LAB (ABR)		
TUE	CME (VKS)	INTERNSHIP		RHTA (SK)	DSS (DPB)		APTITUDE (ABR)	COMPUTER AIDED DETAILING OF STRUCTURE LAB (SP, DPB)	
WED	CME (VKS)	APTITUDE (ABR)		DSS (DPB)	MMM		CT (ABR)	LIBRARY	PHYSICAL EDUCATION (DK)
THU	CME (VKS)	RHTA (SK)		DSS (DPB)	MINI PROJECT		CT (ABR)	MINI PROJECT	APTITUDE TEST (SKS)
FRI	SAFS (RP)	CT (ABR)		INTERNSHIP	SAFS (RP)		RHTA (SK)	DSS (DPB) Tutorial	LIBRARY
SAT	SAFS (RP)	MINI PROJECT			SAFS (RP)		ARCHITECTURE CLASS		

Allocation of Courses

Course Code	Course Initial	Course Title	Name of the Faculty	Faculty Initial
21CV61	RSMC	CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP (CME)	Mr. VARADARAJ K S	VKS
21CV62	IPCC	CONCRETE TECHNOLOGY (CT)	Mr. ANUSHA B RAO	ABR
21CV63	PCC	DESIGN OF STEEL STRUCTURE (DSS)	Mr. B DURGAPRASAD BALIGA	DPB
21CV645	PEC	RAILWAYS, HARBOR, TUNNELING AND AIRPORT (RHTA)	Mr. SANTHOSH K	SK
21AG653	OEC	SUSTAINABLE AGRICULTURE AND FOOD SECURITY (SA&FS)	Dr. RAHUL PHATAK	RP
21CVL66	PCC	COMPUTER AIDED DETAILING OF STRUCTURE (CADS)	Mr. SURENDRA P Mr. B DURGAPRASAD BALIGA	SP DPB
21CVMP67	MP	MINI PROJECT (MP)	MINI PROJECT GUIDES	
21INT68	INT	INNOVATION/ ENTREPRENEURSHIP/ SOCIETAL INTERNSHIP (SI)	Dr. H G UMESHCHANDRA	HGU
-		APTITUDE/ APTITUDE-TEST	Ms. ANUSHA B RAO Mr. SHANKARGIRI K S	ABR SKS
		MENTOR MENTEE MEETING (MMM)	ALLOTTED FACULTIES	

Timetable Coordinator   Dept. of Civil Engineering   Dean Academics   Principal

Alva's Institute of Engg. & Tech.
Mijar, Moodbidri

Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225, D.

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CIVIL ENGINEERING DEPARTMENT

Ref: AIET/CV/EVEN/23-24/IT6   Date: 29/04/2024

PERSONAL CLASS TIMETABLE

Faculty: PROF. SANTHOSH K.   ACADEMIC YEAR: 2023 – 24

Designation: Assistant Professor   EVEN SEMESTER

Day/Time	9.00 am – 9.50 am	9.50 am – 10.40 am		11.00 am – 11.50 am	11.50 am – 12.40 pm	L U N C H B R E A K	1.40 pm – 2.30 pm	2.30 pm – 3.20 pm	3.30 pm – 5.00 pm
Monday		2 – E GB	T E A B R E A K		6 – A RHTA			2 – C GB	
Tuesday	2 – E GB			6 – A RHTA					
Wednesday	6 – B AGT			2 – C GB					2 – I MMM
Thursday		6 – A RHTA					2 – E GB		6 – B AGT
Friday		2 – C GB		2 – E GB			6 – A RHTA		
Saturday	2 – C GB								

TEACHING WORKLOAD

Course	Course Code	Course Title	Course Type	Hours	Hrs.*Units	Total Units
CII	BETCK205B	Green Buildings (GB) [2 – C]	T	4	4*2	8
ETCII	BETCK205B	Green Buildings (GB) [2 – E]	T	4	4*2	8
PEC	21CV643	Railways, Harbors, Tunneling and Airports (RHTA)	T	4	4*2	8
PCC	18CV62	Applied Geotechnical Engineering (AGT)	T	2	2*2	4
		Mentor Mentee Meeting	O	1.5	1.5*0.5	0.75
			TOTAL	15.5 Hrs.		28.75 Units

DEPARTMENT RESPONSIBILITIES	INSTITUTE RESPONSIBILITIES
1. Class Coordinator- 4th Year 2. EMS, VTU, AICTE Work Coordinator 3. Concrete & Highway Materials Testing Laboratory In-Charge 4. Alumni Association Coordinator 5. Placement and Training Coordinator	---

SURENDRA P.
TIMETABLE COORDINATOR

H.O.D.
Dept. of Civil Engineering
Alva's Institute of Engg. & Technology
Mijar, Moodbidri - 574 225

DEAN ACADEMICS

PRINCIPAL
PRINCIPAL
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225, D.K

Copy to: 1) Principal's Table
2) Dean Academics
3) HOD – CE

RAILWAYS, HARBOUR, TUNNELING AND AIRPORTS

Course Code	21CV643	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	(3:0:0)	SEE Marks	50
Total Hours of Pedagogy		Total Marks	100
Credits	03	Exam Hours	03

Course objectives:
- Understand the history and development, role of railways, railway planning and development based onessential criteria.
- Learn different types of structural components, engineering properties of the materials, to calculate the material quantities required for construction.
- Understand various aspects of geometrical elements, points and crossings, significance of maintenance of tracks.
- Design and plan airport layout, design facilities required for runway, taxiway and impart knowledge about visualaids
- Apply design features of tunnels, harbors, dock and necessary navigational aids; also expose them to variousmethods of tunneling and tunnel accessories.

Teaching-Learning Process (General Instructions)
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.
1. Blackboard teaching/PowerPoint presentations (if needed)
2. Regular review of students by asking questions based on topics covered in the class.

Module-1

Railway Planning: Significance of Road, Rail, Air and Water transports – Coordination of all modes to achieve sustainability

– Elements of permanent way, - Rails, Sleepers, Ballast, rail fixtures and fastenings, – Track Stress, coning of wheels, creep in rails, defects in rails

Route alignment surveys, conventional and modern methods- – Soil suitability analysis – Geometric design of railways, gradient, super elevation, widening of gauge on curves- Points and Crossings (Explanation & Sketches of Right- and Left-hand turnouts only).

Teaching-Learning Process	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.

Module-2

Railway Construction and Maintenance: Earthwork – Stabilization of track on poor soil, Calculation of Materials required for track laying – Construction and maintenance of tracks – Modern methods of construct ion & maintenance – Railway stations and yards and passenger amenities- Urban rail – Infrastructure for Metro, Mono and underground railways.

Teaching-Learning Process	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.

Module-3

Harbour and Tunnel Engineering: Definition of Basic Terms: Planning and Design of Harbours: Requirements,Classification, Location and Design

Principles – Harbour Layout and Terminal Facilities, Coastal Structures, Inland Water Transport – Wave action onCoastal Structures and Coastal Protection Works.

Tunneling: Introduction, size and shape of the tunnel, tunneling methods in soils, tunnel lining, tunnel drainage and ventilation.

Teaching-Learning Process	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.

Module-4

| **Airport Planning:** Air transport characteristics, airport classification, airport planning: objectives, components, layout characteristics, and socio-economic characteristics of the catchment area, criteria for airport site selection and ICAO stipulations, typical airport layouts, Parking and circulation area. |

| Teaching-Learning Process | 1.Blackboard teaching/PowerPoint presentations (if needed)
2.Regular review of students by asking questions based on topics covered in the class. |

Module-5

| **Airport Design:** Runway Design: Orientation, Wind Rose Diagram, Runway length, Problems on basic and Actual Length, Geometric design of runways, Configuration and Pavement Design Principles, Elements of TaxiwayDesign, Airport Zones, Passenger Facilities and Services, Runway and Taxiway Markings and lighting. |

| Teaching-Learning Process | 1.Blackboard teaching/PowerPoint presentations (if needed)
2.Regular review of students by asking questions based on topics covered in the class. |

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

1. Acquires capability of choosing alignment and also design geometric aspects of railway system, runway andtaxiway.
2. Suggest and estimate the material quantity required for laying a railway track and also will be able to determinethe hauling capacity of a locomotive.
3. Develop layout plan of airport, harbour, dock and will be able relate the gained knowledge to identify requiredtype of visual and/or navigational aids for the same.
4. Apply the knowledge gained to conduct surveying, understand the tunnelling activities.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject **(duration 03 hours)**

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3

sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module

Suggested Learning Resources:

Books

1. Saxena Subhash C and Satyapal Arora, "A Course in Railway Engineering", Dhanpat Rai and Sons, Delhi.
2. Satish Chandra and Agarwal M. M, "Railway Engineering", 2nd Edition, Oxford University Press, New Delhi.
3. Khanna S K, Arora M G and Jain S S, "Airport Planning and Design", Nemch and and Brothers, Roorkee.
4. CVenkatramaiah, "Transportation Engineering", Volume II: Railways, Airports, Docks and Harbours, Bridges and Tunnels, Universities Press.
5. Bindra S P, "A Course in Docks and Harbour Engineering", Dhanpat Rai and Sons, New Delhi.

Web links and Video Lectures (e-Resources):

- . https://nptel.ac.in/courses/105107123

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Seminars/Quiz (To assist in GATE Preparations)
- Self-Study on simple topics
- Simple problems solving using Excel

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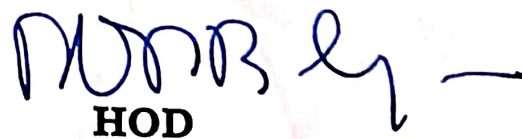
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DEPARTMENT OF CIVIL ENGINEERING

STUDENT LIST FOR THE ACADEMIC YEAR 2023-2024

III - Year

SL.NO	USN	NAME OF THE STUDENT
1	4AL21CV001	A DHANUSH
2	4AL21CV002	BINDYA G S
3	4AL21CV003	D S CHAITHRESH
4	4AL21CV004	LAISHRAM SHEKARCHANDRA
5	4AL21CV005	NIRMITHA A S
6	4AL21CV006	PRAKHYATH
7	4AL21CV007	PRASHANTH S
8	4AL21CV008	PRUTHVI M
9	4AL21CV009	RAJU ANNIGERI
10	4AL21CV010	RASHEK
11	4AL21CV011	S V VINAYAKA BHANDARKAR
12	4AL21CV012	SHREE DODDAMANI
13	4AL21CV013	SUHAS K
14	4AL21CV014	VAFA
15	4AL22CV400	GIRISH A SHINGADI
16	4AL22CV401	MEHUL V BANGERA
17	4AL22CV402	NAGENDRA
18	4AL22CV403	PAVAN
19	4AL22CV404	SHAILESH KUMAR

HOD

ATTENDANCE BOOK

Academic Year : 2023-24

Semester : VI ...... Section ...... A

Period of the Semester : From 29/4/2024 to 26/7/2024

21EV643

Subject with Code : Railway, Harbours, Tunneling & Airport

Name of the Faculty : Santhosh K

Department : Civil Engineering

VISION OF THE INSTITUTE

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- To inculcate the best engineering practices through transformative education.

- To develop a knowledgeable individual for a dynamic industrial scenario.

- To inculcate research, entrepreneurial skills and human values in order to cater the needs of the society.

VISION OF THE DEPARTMENT

✓ To become a leaders in the field of civil Engineery by imparting quality education in developing highly competent manpower and promote research to meet the current future & future challenges in civil Engg. field

MISSION OF THE DEPARTMENT

• ✓ To impart knowledge by creating condusive teaching learning environment

• To produce civil Engineer of high caliber technical skills & ethical values, to serve the society

• To promote innovation in the minds of future engineers. to face the challenges

COURSE OUTCOMES

CO1	Acquires Capability of choosing alignment & also design geometric aspects of railway system, runway, & taxiway
CO2	Suggest & estimate the material quantity required for laying a railway track & also will be able to determine hauling capacity of a locomotive
CO3	Develop & estimate the material layout & plan of air port, harbour, dock & will be able relate the gained knowledge to identify required type of visual &/o.s navigational aids for the Same
CO4	apply the knowledge gained to conduct surveying understand the tunneling activities.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	—	—	—	—	—									
CO2	2	1	—	—	—	—	—									
CO3	2	1	—	—	—	—	—									
CO4	2	1	—	—	—	—	—									
CO5	2	1	—	—	—	—	—									
CO6	—	—														

AIET	Lesson Plan & Execution	Format No.	ACD 08
		Issue No.	01
		Rev. No.	00

Name of the faculty	Santhosh. K
Semester and Section	6th Semester
Date of Commencement	29/4/2024.
Last Working Day of the Semester	✓ 07/5 26/7/2024
Source Materials List	Author.
1. A Course in Railway Sys	Saxena and Subhas C
2. Railway Engg.	Satish Chandra
3. Air port planning.	S. K Khanna.
4. Harbour Engineering.	Bindra. S. K
5.	
Subject Name	✓ Railway harbours, Tunneling & Airport

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
1	29/4	module 1 Significance of Road, Rail, Air and water	1 & 2	& Covered.	30/4	1
2	30/4	Elements of Permanent way Rails	1 & 2	Covered.	2/5	1
3	03/5	Ballast Sleepers	1 & 2	Rails classification functions	7/5	1
4	7/5	rail fixture and fastening.	1 & 2	Ballast classification	9/5	1

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
5	7/5	Railway alignment survey.	1 & 2	~~Ballast~~ Sleeper function.	13/5	(
6	9/5	Soil stability analysis	1&2	sleeper classification	14/5	1
7	11/5	Geometric design	1&2	sleepers Ballast.	16/5	(
8	13/5	Geometric Design.	1&2	Ballast. function & classification	17/5	(
9	14/5	module-2 Earthwork Stabidization	1&2	Geometrical Design.	20/5	1
10	16/5	Calculation of material. for track	1&2	Geometrical design	21/5	1
11	17/5	Construction & maintenance of track	1&2	Geometric design.	22/5	1
12	20/5	Railway station & yard	1&2	Points & crossing.	24/5	1
13	21/5	Passenger amenities.	1&2	Points & crossing.	27/5	1
14	24/5	urban Rail infrae structure	1&2	Earthwork Stabilization	29/5	7
15	27/5	mono railway	1&2	1st IA-Test	04/6	7
16	28/5	under ground railway	1&2	Calculation of material required.	5/6	1
17	30/5	module-3 Definition of basic terms	4	Calculation of materials	10/6	1

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
18	31/5	Plans and Design of Harbours	4	Construction & maintaince of track	13/6	1
19	3/6	Requirements classification	4	Construction maintaince of track	18/6	1
20	5/6	Location & Design Harbour layout	4	modern method of Construction	20/6	1
21	8/6	terminal facilities Costal Structure	4	Railway Stations yard.	22/6	1
22	10/6	Inland water transportation.	4	Passage of roadmovnt urban raid. for metro.	24/6	1
23	12/6	Tunneling Size & Shape.	4	mono & underground railway.	25/6	1
24	14/6	methods of Tunnelling.	4	Defination of Basic terms. Planning & Design.	27/6	1
25	18/6	module - 4 Air transport	3	Requirements. classification of Harbor.	02/7	1
26	20/6	classification & characteristics	3	Harbor layout Costal Structure Inland water	02/7	1
27	22/6	wind rose Diagram ronway length	3	transportation Air port Characteristics	04/7	1
28	24/6	Problems on basic & Actual length	3	air port classification & Planning.	5/7	1
29	26/6	class components layout Characteristic	3	layout and its Components	9/7	1
30	28/6	Economic Character ystic, catchment area.	3	Criteria for air port seloction of site.	11/7	1

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referre
31	26/7	Design of airport zone passenger facility	3	Parking & circulation Area.	15/7	1
32	4/7	Run way and Taxi way.	3	Run way Design wind Rose Diagram	15/7	1
33	6/7	module - 5 Run way Design	3	Runway length Numericals.	16/7	1
34	8/7	wind rose Diagram Runway length	3	Geometric Design of run way.	18/7	1
35	10/7	Geometric Design.	3	Configuration & pavement. priciple	18/7	1
36	12/7	configuration & Pavement Design.	3	Taxi way Eluments.	22/7	1
37	15/7	Airport zone	3	Airport zone facility & services.	22/7	1
38	18/7	Taxi way Design.	3	Run way & Taxiway morsing & lighting.	23/7	1
39	20/7	Runtoo Run way design.	3	Tunnelling size & shape. tunnel ding.	23/7	1
40	22/7	marking & lighting.	3	drain 3rd IA. tunnoding methods in soil	29/7	1
41	23/04/2024			Tunnel ding. tunnel drainage	30/7	1
42				tunnelling method Tunnel ventilation.	31/7	1

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR
MOODBIDRI - 574 225

ATTENDANCE CUM INTERNAL

Class : 6th
Subject : Railway, Harbor, Tunneling & Airport
No. of Classes held : 42

Subject : 21CV643

IA-test

Sl. No.	USN	Name	No. of Class Attended	% of Attendance	Internal Assessment (25) (20)	(20)	(20)	Average Marks (50)
1	HAL21CV001	A Dhanush	38	90	18	15	18	48
2	CV002	Bindya G S	41	98	17	20	20	48
3	CV003	D S Chaithresh	42	100	18	20	19	50
4	CV004	Laishram S	40	96	12	14	12	46
5	CV005	Nirmitha A S	41	98	15	18	19	48
6	CV006	Prakhyath	42	100	17	19	19	48
7	CV007	Prashanth S	41	98	16	20	20	50
8	CV008	Pruthvi M	40	96	15	17	16	49
9	CV009	Raju Annagiri	39	94	15	18	18	46
10	CV010	Rashek	40	96	16	16	18	49
11	CV011	S. V Vinayaka	38	90	16.	18	18	50
12	CV012	Shree Joddameni	37	88	18	14	11	46
13	CV013	Suhas K	41	98	20	19	20	50
14	CV014	Vafa	40	96	19	20	19	49
15	22CV400	Girish A	38	90	15	18	14	48
16	CV401	Mehul V	41	98	15	19	19	49
17	CV402	Nagendra	37	88	20	20	20	50
18	CV403	Pavan	41	98	19	20	19	48
19	22CV404	Shailesh Kumar	41.	98	17	20	19	48

Class : 6th
Subject : Railway, Harbour, Tunneling & Airpo...
No. of Classes held : 42

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY
MIJAR MOODBIDRI - 574 225

Subject : 21CV643

Sl. No.	U.S.N.	Name	Assignment-1	Assignment-2	Assignment-3	Assignment-4	Avg (20m)	Quiz (20m)	No. of Class Attended	% of Attendance	IA (20)	IA (20)	IA (20)	Average Marks (50)
1	HAL21CV001	A Dhanush	10	10	10	10	20	20	38	90	18	15	18	48
2	CV002	Bindya G S	10	10	10	10	20	20	41	98	17	20	20	48
3	CV003	D S Chaithresh	10	10	10	10	20	20	42	100	18	20	19	50
4	CV004	Laishram S	10	10	10	10	20	20	40	96	12	14	12	46
5	CV005	Nirmitha A S	10	10	10	10	20	20	41	98	15	18	19	48
6	CV006	Prakhyath	10	10	10	10	20	20	42	100	17	19	19	48
7	CV007	Prashanth S	10	10	10	10	20	20	41	98	16	20	20	50
8	CV008	Pruthvi M	10	10	10	10	20	20	40	96	15	17	16	49
9	CV009	Raju Annegiri	10	10	10	10	20	20	39	94	15	18	18	46
10	CV010	Rashek	10	10	10	10	20	20	40	96	16	16	18	49
11	CV011	S. V Vinayaka	10	10	10	10	20	20	38	90	16	18	18	50
12	CV012	Shree doddamani	10	10	10	10	20	20	37	88	13	14	11	46
13	CV013	Suhas K	10	10	10	10	20	20	41	98	20	19	20	50
14	CV014	Vafa	10	10	10	10	20	20	40	96	19	20	19	49
15	22CV400	Girish A	10	10	10	10	20	20	38	90	15	18	14	48
16	CV401	Mehul V	10	10	10	10	20	20	41	98	23	19	19	49
17	CV402	Nagendra	10	10	10	10	20	20	37	88	20	20	20	50
18	CV403	Pavan	10	10	10	10	20	20	41	98	19	20	19	48
19	22CV404	Shailesh Kumar	10	10	10	10	20		41	98	17	20	19	48

Staff Initials

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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CIVIL ENGINEERING DEPARTMENT

FIRST CONTINUOUS INTERNAL EVALUATION TEST QUESTION PAPER

Semester: VI	Date: 04/June/2024
Course Code: 21CV643	Time: 9.30 a.m. – 11.00 a.m.
Course Title: Railways, Harbors, Tunneling and Airports	Maximum Marks: 20
Modules Covered: 1	COs' Covered: CO 1
Faculty: Santhosh K	Department: Civil Engineering

Note: (1) Answer any TWO full questions, choosing ONE full question from each part.

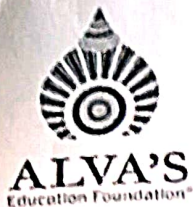| Q. No.	Questions	Marks	CO	RBT/CL
	PART – A			
1) (a)	Discuss the significance of rail, road water and air transport.	04	CO1	L2
(b)	Mention the requirements of an ideal permanent way.	06	CO1	L2
	– OR –			
2) (a)	With a neat sketch, explain the function of components of a permanent track.	05	CO1	L2
(b)	What are the requirements of a good ballast? Mention the different types of ballast.	05	CO1	L2
	PART – B			
3) (a)	With neat sketch explain coning of wheel.	05	CO1	L2
(b)	Describe the various types of gradients indicating recommended values.	05	CO1	L2
	– OR –			
4) (a)	Discuss the conventional methods of route alignment survey.	05	CO1	L2
(b)	What is creep of rail? Explain briefly the causes of creep.	05	CO1	L2

Signature of Faculty

Signature of IQAC Member

Signature of IQAC Chairman

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CIVIL ENGINEERING DEPARTMENT

FIRST CONTINUOUS INTERNAL EVALUATION TEST QUESTION PAPER REVIEW REPORT

Semester: VI

Course Code: 21CV643

Course Title: Railways, Harbors, Tunneling and Airports

Modules Covered: 1

Faculty: Santhosh K

Date: 04/June/2024

Time: 9.30 p.m. – 11.00 p.m.

Maximum Marks: 20

COs' Covered: CO 1

Department: Civil Engineering

Question No.		Course Outcome (CO)	Bloom's Taxonomy Level	Marks
1	a	CO 1	L2	04
	b	CO 1	L2	06
2	a	CO 1	L2	05
	b	CO 1	L2	05
3	a	CO 1	L2	05
	b	CO 1	L2	05
4	a	CO 1	L2	05
	b	CO 1	L2	05
Total Marks				40

[BT Level: L1-Remember, L2-Understand, L3 -Apply, L4 -Analyze, L5- Evaluate, L6- Create]

CONSOLIDATED MARKS FOR DIFFERENT BT LEVELS

BT Level	Marks at Each Level	% Marks	Remarks
L2	40	100	

SCRUTINIZER/REVIEWER REMARKS

Approved		Approved with Correction		Rejected	
Reason for Rejection					

Surendra

Name & Signature of the Scrutinizer

Date: 01/06/24

B. DURGAPRASAD BALIGA 03/06/2024

Name & Signature of the IQAC Coordinator

Date: 03/06/2024

Signature of Head of the Department 03/06/2024

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CIVIL ENGINEERING DEPARTMENT

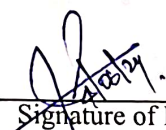### FIRST CONTINUOUS INTERNAL EVALUATION TEST: SCHEME OF VALUATION

Semester: VI
Subject Code: 21CV43
Subject Title: Railways, Harbors, Tunneling and Airports
Modules Covered: 1
Faculty: Santhosh K

Date: 04/June/2024
Time: 9.30 p.m. – 11.00 p.m.
Maximum Marks: 20

COs' Covered: CO 1
Department: Civil Engineering

Prepared by:
Name: Santhosh. K

Signature of Faculty

Approved by:
Name: Surendra. P

Signature of IQAC Member

Name: B. Durgaprasad Baliga
Signature of IQAC Chairman

Q. NO.	SOLUTION	MARKS
1 a)	**Rail transport** • Owing to the heavy expenditure on the basic infrastructure required, rail transport is best suited for carrying bulk commodities and a large number of passengers over long distances. • This is the most commonly used and cost effective long distance transport system of the country.	1M
	Road transport • Owing to flexibility of operation and the ability to provide door-to-door service, road transport is ideally suited for carrying light commodities and a small number of passengers over short distances. • The importance of roads in connecting the vast rural areas of	1M
	Air transport • Owing to the heavy expenditure on the sophisticated equipment required and the high fuel costs, air transport is better suited for carrying passengers or goods that have to reach their destinations in a very short period of time. • Air transport is an integral part of transport infrastructure and a significant sector of the economy. • Airports are recognized for their ability to multiply business activity in their proximity and stimulate further development	1M
	Water transport • Owing to low cost of infrastructure and relatively slow speeds, water transport is best suited for carrying heavy and bulky goods over long distances, provided there is no consideration of the time factor. • Water transport is the cheapest and the oldest mode of transport. • It operates on a natural track and hence does not require huge capital investment in the construction and maintenance of its track except in case of canals.	1M
1b)	**Requirements of Permanent track** • They should be of proper composition of steel and should be manufactured by open fireplace or duplex process. • The vertical stiffness should be high enough to transmit the load to several sleepers underneath. The height of rail should therefore adequate. • Rails should be capable of withstanding lateral forces. Large width of head and foot	6 M

endows the rails with high lateral stiffness.
- The head must be sufficiently deep to allow for an adequate margin of vertical wear. The wearing surface should be hard.
- Web of rails should be sufficiently thick to bear the load coming on it and should provide adequate flexural rigidity.
- Foot should be wide enough so that rails are stable against overturning especially on curves.
- Bottom of the head and top of the foot of rails should be so shaped as to enable the fish plates to transmit the vertical load efficiently from the head to the foot at rail joints.
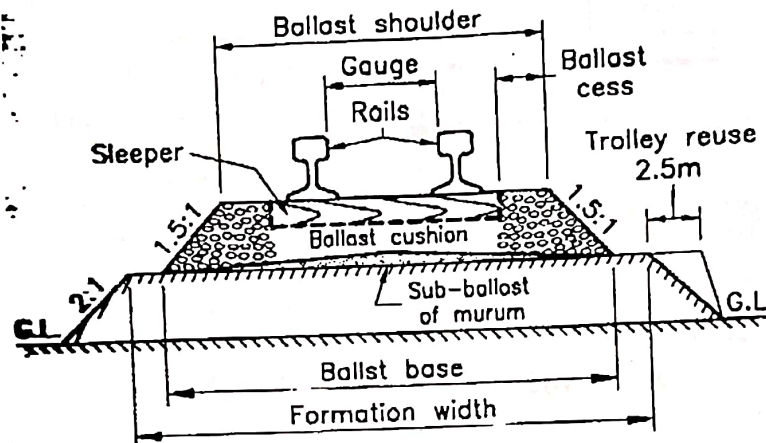
2 a)

2 M

Fig. 1 C/S of Permanent Track.

- The track or permanent way is the rail road on which trains run.
- The combination of rails, fitted on sleepers and resting on ballast and subgrade is called the railway track or permanent way.
- In a permanent way, the rails are joined in series by fish plates and bolts and then they are to sleepers by different types of fastenings.
- The sleepers properly spaced, resting on ballast, are suitably packed and boxed with ballast.
- The layer of ballast rests on the prepared subgrade called the formation.
- The rails act as girders to transmit the wheel load to the sleepers.

3M

2 b)

- The size of the ballasts used varies from 1.9 cm to 5.1 cm gauge.
- Stones of larger sizes are not desirable and the maximum size as 5.1 cm is preferable, as interlocking of stones of this size is better than that of stone of larger sizes.
- The best ballast is that which contains stones varying in size from 1.9 cm to 5.1 cm with reasonable proportion of intermediate sizes.
- The exact size of the ballast depends upon the type of sleeper used and location of the track as below –
  - Ballast size for wooden sleepers tracks = 5.1 cm. (gauge)
  - Ballast size for steel sleepers tracks = 3.8 cm. (gauge)
  - Ballast size for under switches and crossings = 2.54 cm. (gauge)

Types of Ballast
  - Broken Stone

3 M

2 M

3a)

- Sand Ballast
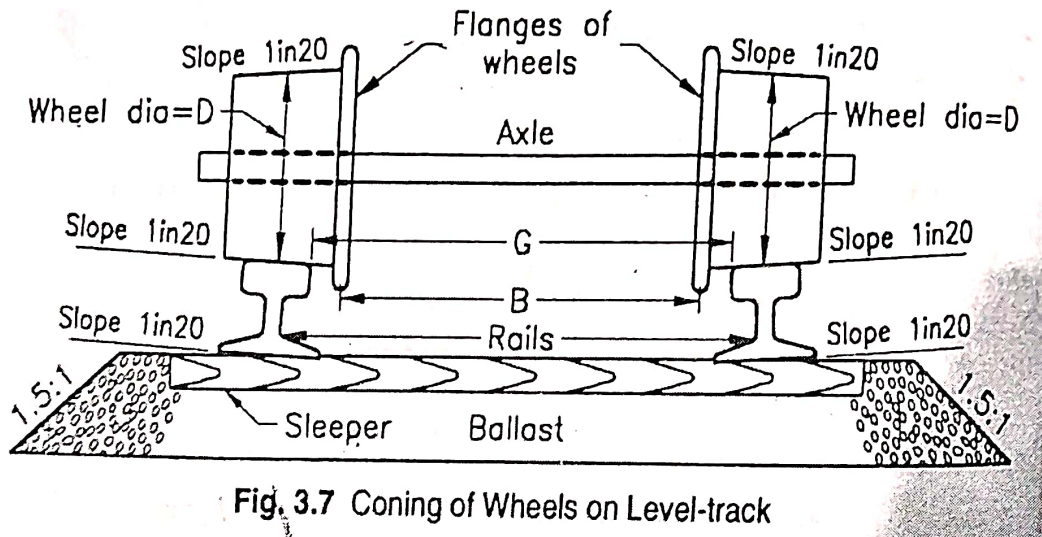- Gravel Ballast
- Cinder ballast
- Brick Ballast

Fig. 3.7 Coning of Wheels on Level-track

- The distance between the inside edges of wheel flanges is generally kept less than the gauge of the track.
- So there is a gap between the wheel flanges and running edges of the rails, nearly equal to 1cm on either side.
- These wheels are coned at a slope of 1 in 20.

3b)

The following types of gradients are used on the railways:

(a) Ruling gradient

(b) Pusher or helper gradient

(c) Momentum gradient

(d) Gradients in station yards

4 a)

In order to have a proper and satisfactory new route, various surveys are carried out:

1. Reconnaissance Survey

2. Preliminary Survey

3. Location Survey

Reconnaissance Survey: It is the first engineering survey. It is a rough and visual identification about location and check map data to live location. A reconnaissance survey can divided into two parts:

1. Traffic survey

2. Engineering survey

Preliminary Survey: Object of preliminary survey

- To conduct the survey work along the alternative routes found out by reconnaissance survey
- To determine with greater accuracy the cost of the railway line along these alternative routes.

Detailed Survey (Final Location Survey)

- The object of final location survey is to transfer or refix the final location of alignment from paper to the ground, in order to carry out the ground survey of this alignment in detail.
- Before getting the sanction of a railway project, a detailed survey is necessary.
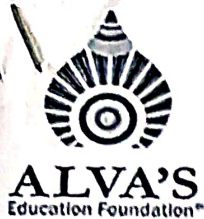
4 b)

Creep of rails

- It is defines as the longitudinal movement of rails with respect to sleepers in a track.
- Creep is common to all railway tracks, but varies in magnitude considerably, the rail in some places moves by several centimeters in a month while in other location the movement of rails may be negligible.

Causes of Creep of Rail

- Acceleration or Starting of Train: At the time of acceleration, Wheel gives lateral thrust which causes creep of rail.
- De-accelerating or Stopping of Train: If sudden stopping of train takes place, braking effect tends to push the rail forward and thus causes creep in forward direction.
- Wave action or Wave Theory: As train is passing under the rolls the portion under the rolling wheels is compressed and depressed slightly due to wheel loads. As more the wheel moves this depression also moves and the portion which is under depression previously comes back to its original position.
- Percussion Theory: This type of creep of rail occurs due to impact of load. In this type, when the wheels of rail passes over the joint, the trailing rails gets depressed down and the wheels gives impact to the facing of rail.

2M

1M

1M

4M

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CIVIL ENGINEERING DEPARTMENT

SECOND CONTINUOUS INTERNAL EVALUATION TEST QUESTION PAPER

Semester: VI

Course Code: 21CV643

Course Title: Railways, Harbors, Tunneling and Airports

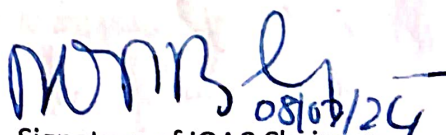Modules Covered: 2 & 3

Faculty: Santhosh K

Date: 09/07/2024

Time: 3.00 p.m. – 4.30 p.m.

Maximum Marks: 20

COs' Covered: CO 2 & 3

Department: Civil Engineering

Note: (1) Answer any TWO full questions, choosing ONE full question from each part.

Q. No.	Questions	Marks	CO	RBT/CL
	PART – A			
1) (a)	Estimate the quantity of materials required per km length of B G track Given weight of rail per km length is 45 kg/m, Length of rail is 12.8m and sleeper density (n+5).	10	CO2	L3
	– OR –			
2) (a)	Discuss the methods of stabilization of track on poor soil.	05	CO2	L2
(b)	Explain the modern methods of track maintenance.	05	CO2	L2
	PART – B			
3) (a)	Explain the classification of railway station.	05	CO2	L2
(b)	Draw the layout of artificial harbor and explain the functions of its components	05	CO3	L2
	– OR –			
4) (a)	Write the advantages and limitations of underground railway.	05	CO2	L2
(b)	List the types of breakwater and write the characteristics of mound breakwater	05	CO3	L2

Signature of Faculty
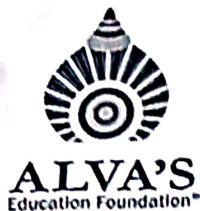
Signature of IQAC Member

Signature of IQAC Chairman

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CIVIL ENGINEERING DEPARTMENT

SECONDCONTINUOUS INTERNAL EVALUATION TEST QUESTION PAPER REVIEW REPORT

Semester: VI	Date: 09/07/2024
Course Code: 21CV643	Time: 3.00 p.m. – 4.30 p.m.
Course Title: Railways, Harbors, Tunneling and Airports	Maximum Marks: 20
Modules Covered: 2 & 3	COs' Covered: CO 2 & 3
Faculty: Santhosh K	Department: Civil Engineering

Question No.		Course Outcome(CO)	Bloom's Taxonomy Level	Marks
1	a	CO 2	L3	10
2	a	CO 2	L2	05
	b	CO 2	L2	05
3	a	CO 2	L2	05
	b	CO 3	L2	05
4	a	CO 2	L2	05
	b	CO 3	L2	05
Total Marks				40

[BT Level: L1-Remember, L2-Understand, L3 –Apply, L4 –Analyze, L5- Evaluate, L6- Create]

CONSOLIDATED MARKS FOR DIFFERENT BT LEVELS

BT Level	Marks at Each Level	% Marks	Remarks
L2	30	75	
L3	10	25	

SCRUTINIZER/REVIEWER REMARKS

Approved		Approved with Correction		Rejected	
Reason for Rejection					

Shankaragiri K S

Name & Signature of the Scrutinizer

Date:

B. DURGAPRASAD BALIGA   08/07/24

Name & Signature of the IQAC Coordinator

Date: 08/07/24

Signature of Head of the Department   08/07/24

FIRST CONTINUOUS INTERNAL EVALUATION TEST: SCHEME OF VALUATION

Semester: VI
Subject Code: 21CV43
Subject Title: Railways, Harbors, Tunneling and Airports
Modules Covered: 2 &3
Faculty: Santhosh K

Date: 09/07/2024
Time: 3.00 p.m. – 4.30 p.m.
Maximum Marks: 20

COs' Covered: CO 2 &3
Department: Civil Engineering

Prepared by:
Name: Santhosh. K

Signature of Faculty

Approved by:
Name: Shankaragoul & S

Signature of IQAC Member

Name: B. Durgaprasad Baliga
Signature of IQAC Chairman

Q. NO.	SOLUTION	MARKS
1a)	Number of rails per km $= \dfrac{1000}{\text{Length of rail}} \times 2$ Length of B.G. rail $= 12.8\ m$ $= \dfrac{1000}{12.8} \times 2 = \underline{157}$	3m
	weight of rails in tonnes per km $= 157 \times 12.8 \times \dfrac{45}{1000} = 90.4$ $\approx \underline{91\ tonnes}$	2m
	Sleepers No. of sleeper per km $= \frac{1}{2} \times 157 \times (12.8 + 5)$ $= \underline{1398}$	2m
	Fish plate $= 2 \times 157 = \underline{314\ nos}$	1m

Bearing plates = 2 × No. of sleepers

$$= 2 × 1318 = \underline{2636}$$

Dog spikes = 4 × No. of sleepers

$$= 4 × 1318 = \underline{\underline{3272}} \text{ Nos}$$

(Above 3272 is written 5598)

D

2 a) Methods of stabilization of track on poor soil.

i) Layer of Moorum

A layer of Moorum varying in thickness from 12" to 24" is laid under ballast
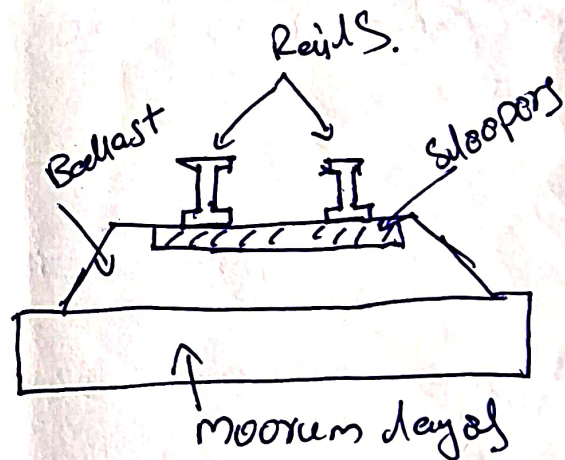
ii) Cement Grouting.

→ Steel tubes of 1¼" in dia is driven into the formation

→ Cement grout is forced under a pressure

1m

1m

2m
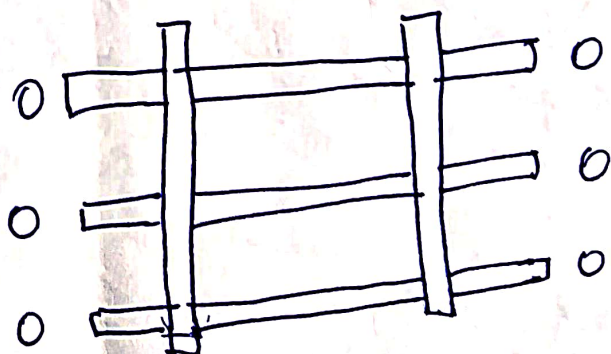
1m

Sand piles (1m)

→ vertical bore hole
of 12" dia is made

→ Space is filled with
Sand & well rammed.
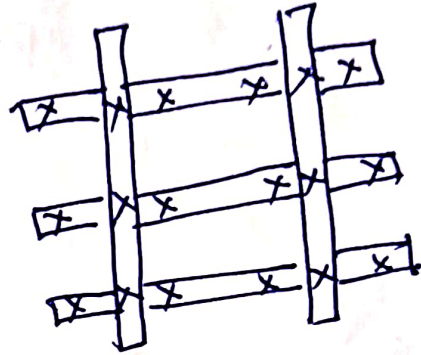
Use of chemicals (1m)

→ Chemical used in place of cement
grout to consolidated soil.

2. b) modern methods of track maintainance

i) mechanical Tamping 2m

→ off track tamping

→ on track tamping.

ii). measured shovel Packing -: track (2m)
defects like un evenness and voids
are accurately measured, the track is
lifted by means of Jack & measured
quantities. of small broken stone chipping
are placed under the Sleepers.

(1m)

iii) Direct track maintainance.

3.a) Railway station classifications

Based on operational.   (2M)

   i) Block station

            → Class A

            → Class B

            → Class C

   ii) Non- Block Station / Class D.   (1m)

Based on functional   (2m)

     → wayside station

     → Junction station

     → Terminal station

3.b) Requirements of Railway station.   (5m)

   → Public Requirement → Booking office

                  → Plat form

                  → Sanitary arrangement

                  → Drinking water

                  → waiting Room.

3.b)

2m

3m
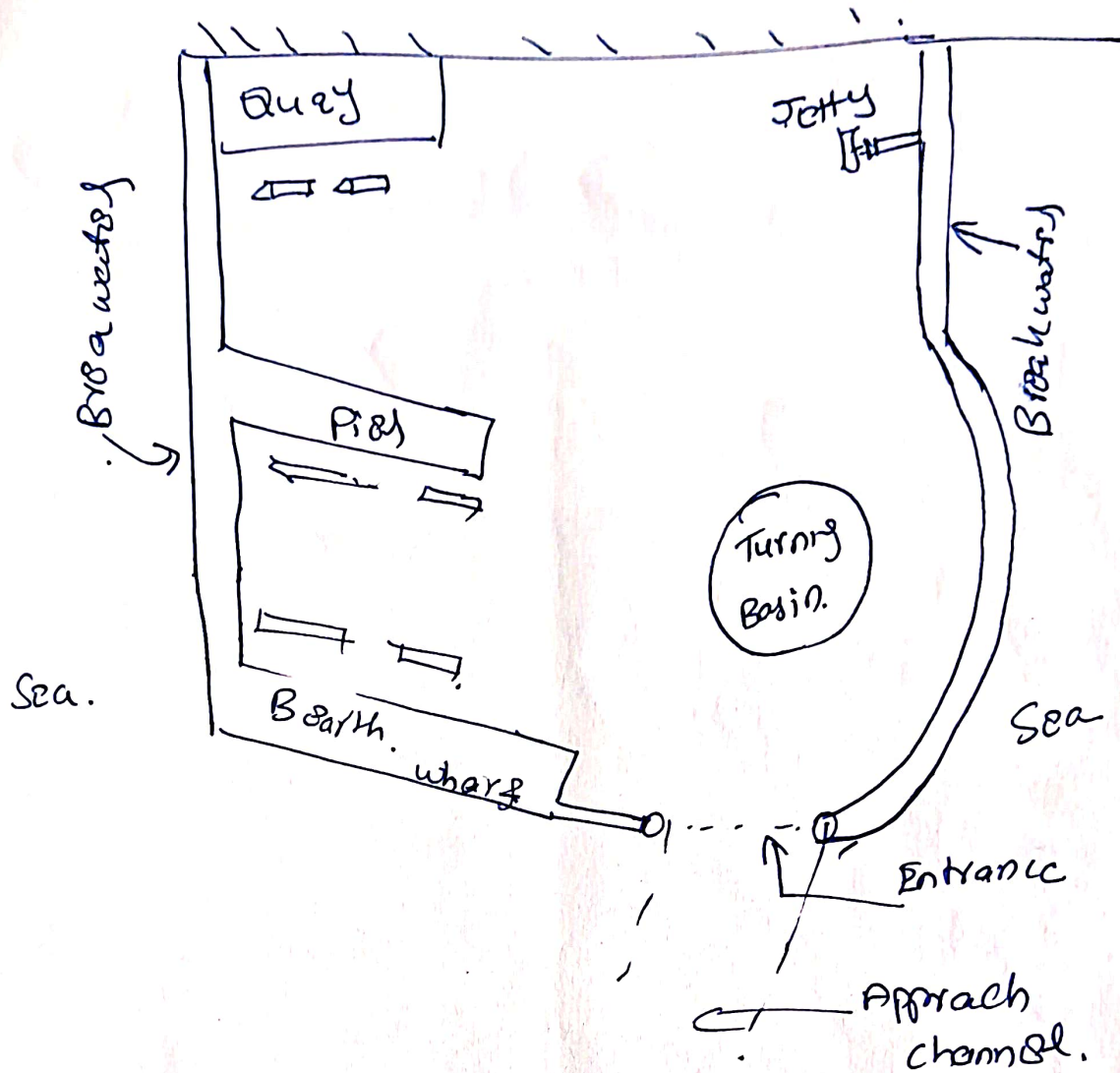
Functions of-

Piers -! Built perpondicules the sea shore

wharf —! Platform for landing

Berth—! Facility for parking the vessels.

Entrance Aproach !— Facility for the entry of ship

Quay —! Parsullal wall given protoction and also utility for berth.

Break water !— Resist the forces from waves.

4.a) Advantages   3m

→ No road crossing.

→ High speed,

→ very high concentration of human traffic

Disadvantages   2m

→ very costly

→ special attention to be given for drainage

→ water supply sewage system of the city are affected.

4.b) Types of breakwater   2m

→ Mound Breakwater

→ vertical wall

→ composite wall

→ special Breakwater

Characteristics

→ Dissipation of kinetic Energy

→ No possibility of sliding

→ No possibility of over turning

→ No. binding material are to be provided

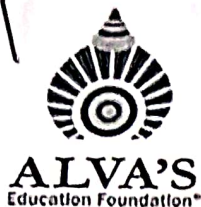→ Natural foundation is unprepared.

write only

3

3m

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
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Shobhavana Campus, Mijar, Moodbidri
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CIVIL ENGINEERING DEPARTMENT

THIRD CONTINUOUS INTERNAL EVALUATION TEST QUESTION PAPER

Semester: VI	Date: 29/07/2024
Course Code: 21CV643	Time: 9.30 a.m. – 11.00 a.m.
Course Title: Railways, Harbors, Tunneling and Airports	Maximum Marks: 20
Modules Covered: 4 & 5	COs' Covered: 3 & 4
Faculty: Santhosh K	Department: Civil Engineering

Note: (1) Answer any TWO full questions, choosing ONE full question from each part.

Q. No.	Questions	Marks	CO	RBT/CL
	PART – A			
1) (a)	Explain the factors considered in the selection of site for airport	05	CO3	L2
(b)	Write a short note on parking and circulation area	05	CO3	L2
	– OR –			
2) (a)	Explain the classification of airport	05	CO3	L2
(b)	Draw a neat sketch of an open parallel concepts of runway and explain the functions of its components	05	CO3	L2
	PART – B			
3) (a)	Explain the procedure of determining best direction of orienting the runway as per Type I with rose diagram with assumed data	05	CO4	L2
(b)	Write a short note on airport marking	05	CO4	L2
	– OR –			
4) (a)	An airport is proposed at an elevation of 400 m above mean sea level where the mean of maximum and mean of average daily temperatures of the hottest month are 44.8° and 26.2° respectively. The maximum elevation difference along the proposed profile of runway is 6.3 m. If the basic length of runway is 1260 m. Determine the actual length of runway to be provided.	10	CO4	L3

Signature of Faculty   Signature of IQAC Member   Signature of IQAC Chairman

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CIVIL ENGINEERING DEPARTMENT

SECOND CONTINUOUS INTERNAL EVALUATION TEST QUESTION PAPER REVIEW REPORT

Semester: VI

Course Code: 21CV643

Course Title: Railways, Harbors, Tunneling and Airports

Modules Covered: 4 & 5

Faculty: Santhosh K

Date: 29/07/2024

Time: 9.30 a.m.–11.00 a.m

Maximum Marks: 20

COs' Covered: 3 & 4

Department: Civil Engineering

Question No.		Course Outcome (CO)	Bloom's Taxonomy Level	Marks
1	a	CO3	L2	05
	b	CO3	L2	05
2	a	CO3	L2	05
	b	CO3	L2	05
3	a	CO 4	L2	05
	b	CO 4	L2	05
4	a	CO 4	L3	10
Total Marks				40

[BT Level: L1-Remember, L2-Understand, L3 –Apply, L4 –Analyze, L5- Evaluate, L6- Create]

CONSOLIDATED MARKS FOR DIFFERENT BT LEVELS

BT Level	Marks at Each Level	% Marks	Remarks
L2	30	75	
L3	10	25	

SCRUTINIZER/REVIEWER REMARKS

Approved		Approved with Correction		Rejected	
Reason for Rejection					

Name & Signature of the Scrutinizer

Date: 28/7/24

B. DURGAPRASAD BALIGA

Name & Signature of the IQAC Coordinator

Date: 27/07/2024

Signature of Head of the Department

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CIVIL ENGINEERING DEPARTMENT

THIRD CONTINUOUS INTERNAL EVALUATION TEST: SCHEME OF VALUATION

Semester: VI
Subject Code: 21CV643
Subject Title: Railways, Harbors, Tunneling and Airports
Modules Covered: 4 & 5
Faculty: Santhosh K

Date: 29/07/2024
Time: 9.30 p.m. – 11.00 p.m.
Maximum Marks: 20

COs' Covered: 3 & 4
Department: Civil Engineering

Prepared by:
Name: Santhosh. K

Signature of Faculty

Approved by:
Name:

Signature of IQAC Member

Name: B. Durgaprasad Baliga
Signature of IQAC Chairman

Q. NO.	SOLUTION	MARKS
1 a)	The factors listed below are for the selection of a suitable site for a major airport installation: • Regional plan • Airport use • Proximity to other airport • Ground accessibility • Topography • Obstructions • Visibility • Wind • Noise nuisance • grading, drainage and soil characteristics • Future development • Availability of utilities from town • Economic consideration	5 M
1b)	• Since the airport users normally arrive at the airport in automobiles, access roads and parking facilities are of vital importance in the airport design. • The circulation of traffic and location of parking lots should be such that access to the terminal building is as convenient as possible. • Access roads are planned to provide fact connections between the airport and the	3M

- travel is lost in ground transportation.
- Circulation of vehicular traffic within the terminal area is also carefully planned.
- It is essential to categorize the vehicular traffic to provide the road network satisfying the specific needs of each traffic category. Broadly the vehicular traffic is classified as passengers, visitors and service personnel.
- These groupings are referred as to the aircraft parking System

      1. Frontal or Linear System
      2. Open Apron or Transporter System
      3. Finger or Pies System
      4. Satellite System

2 M

2a)

2M

Based on Take-off & Landing

- ❖ Conventional Take-Off and Landing Airport (CTOL)
     Runway Length > 1500 m
- ❖ Reduced Take-Off and Landing Airport (RTOL)
     Runway Length 1000 to 1500 m
- ❖ Short Take-Off and Landing Airport (STOL)
     Runway Length 500 to 1000 m
- ❖ Vertical Take-Off and Landing Airport (VTOL)
     Operational area 25 to 50 sq m.

Based on Function.

1M

- ❖ **Civil Aviation**

  It is one of two major categories of flying, representing all non-military **aviation**, both private and commercial.

  - • **Domestic**
  - • **International**
  - • **Regional airport**

- ❖ **Military Aviation**

  Military aviation is the use of military aircraft and other flying machines for the purposes of conducting or enabling aerial warfare, including national airlift capacity to provide logistical supply to forces stationed in a theater or along a front.

Based on Geometric Design:

1M

- Properly designed airport geometry provides optimum efficiency in traffic operation with maximum safety.
- Geometric design of runway is considered as the major part of the design of runway.

1M

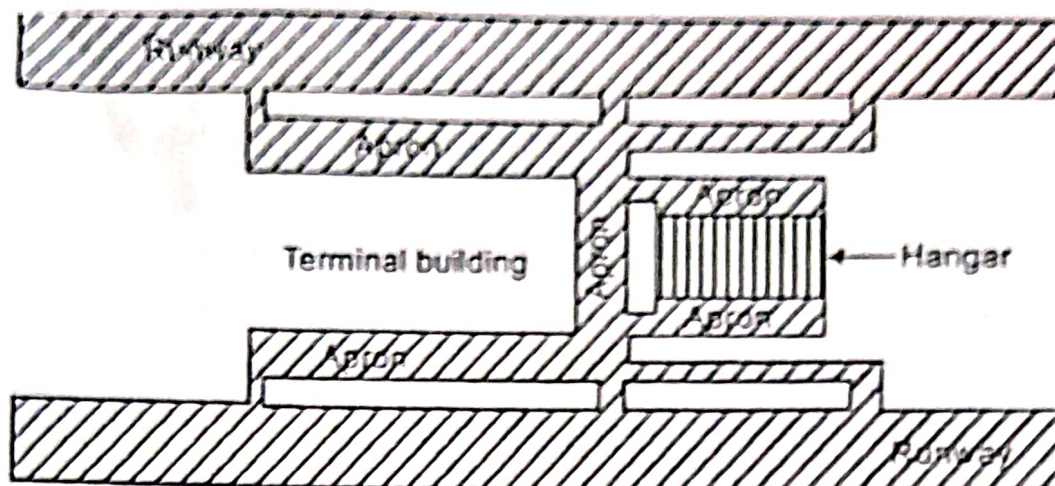## Based on Aircraft Wheel Characteristics:

Aircraft wheels are an important component of a landing gear system. With tires mounted upon them, they support the entire weight of the **aircraft** during taxi, takeoff,

2 b)
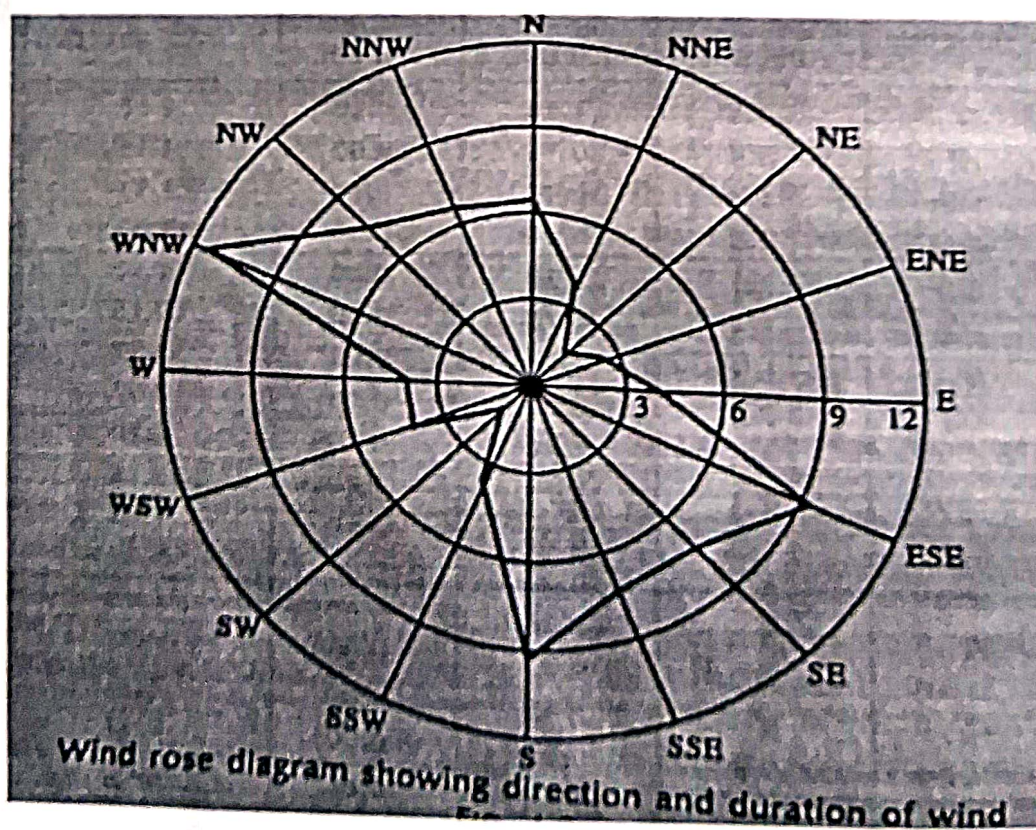

the main components of airport are

- Runway
- Terminal Building
- Apron
- Taxiway
- Aircraft Stand
- Hanger
- Control Tower
- Parking

3a)

Wind rose diagram showing direction and duration of wind

2M

3 M

2M

> The radial lines indicate the wind direction and each circle represents the duration of wind to a certain scale.
> From the wind data it is observed that the total % of time in a year during which the wind blows from north direction is 6.10 %.
> This value is plotted along the north direction in figure.
> Similarly other values are also plotted along the respective directions.
> All plotted points are then joined by straight lines.
> *The best direction of runway usually along the direction of the longest line on wind rose diagram.*
> *from the figure WNW- ESN is the best orientation for the run way*

3 b)

❖ **Runway and Taxiway Marking** In order to aid pilots in guiding the aircraft on runways and taxiways, pavements are marked with lines and numbers. These markings are of benefit primarily during the day and dusk.

❖ **Runway Designators** The end of each runway is marked with a number, known as a runway designator, which indicates the approximate magnetic of the runway in the direction of operations.

❖ **Runway Threshold Markings** Runway threshold markings identify to the pilot the beginning of the runway that is safe and available for landing.

❖ **Centerline Markings** Runway centerline markings are white, located on the centerline of the runway, and consist of a line of uniformly spaced stripes and gaps.

❖ **Aiming Points** Aiming points are placed on runways of at least 4000 ft in length to provide enhanced visual guidance for landing aircraft.

❖ **Touchdown Zone Markings** Runway touchdown zone markings are white and consist of groups of one, two, and three rectangular bars symmetrically arranged in pairs about the runway centerline

4a.

Check for elevation

$$\frac{7}{100} \times \frac{400}{300} = \underline{118 \ m}$$

$$\text{length} = 118 + 1260 = \underline{1378 \ m}$$

check for Temperature

$$= 15 - \left(\frac{6.5}{100} \times 400\right) = \underline{\underline{12.4}}$$

2m

Reference temp = $\underline{\underline{32.4}}$

Rise in Temp = $\underline{\underline{20^\circ C}}$

2m

Corrected length = $\underline{\underline{276}}$

$$= 1378 + 276 = \underline{\underline{1654 \, m}}$$

According to ICAO.

$$\% \text{ of correction} = \frac{394}{1260} \times 100 = \underline{\underline{31\%}} \quad 2m$$

Should be $< 35\%$.

20% for every gradient 1% Gradient

$$\left(\frac{20}{100} \times 1654\right) \times \frac{0.5}{1} = \underline{\underline{165.4}}$$

2m

Total length = $165.4 + 1654 = \underline{\underline{1819 \, m}}$

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Department	Civil Engineering	Assignment No.	01
Course Title	Railways, Harbors, Tunneling and Airports	Max. Marks	50
Course Code	21CV643	Date of announcement	10/06/2024
Subject Teacher	Santhosh K	Date of submission	20/06/2024
Branch/Semester	CE/VI	Modules covered	Module – 1

Q. No.	Questions	Marks	COs	BTL
	Module – 1			
01	With a neat sketch, explain the function of components of a permanent track.	10	CO1	L2
02	Explain the function and requirements of following i) Rail ii) Ballast iii) Sleepers	10	CO1	L2
03	With neat sketch explain coning of wheel. Also write the advantages	10	CO1	L2
04	With neat sketch explain the right hand and left left turn out.	10	CO1	L2
05	Write a short note on Geometric Design of Track.	10	CO1	L2

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Shobhavana Campus, MIJAR-574225, Moodbidri, D.K., Karnataka
Ph: 08258-262725;Mob:722262724,7026262725,mail:principalaiet08@gmail.com

Department	Civil Engineering	Assignment No.	02
Course Title	Railways, Harbors, Tunneling and Airports	Max. Marks	10
Course Code	21CV643	Date of announcement	15/06/2024
Subject Teacher	Santhosh K	Date of submission	25/06/2024
Branch/Semester	CE/VI	Modules covered	Module – 2

Q. No.	Questions	Marks	COs	BTL
	Module – 2			
01	Estimate the quantity of materials required per km length of B G track Given weight of rail per km length is 45 kg/m, Lengthy of rail is 12.8 m and sleeper density (n+5).	10	CO2	L3

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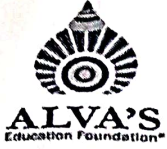Recognized by Government of Karnataka.
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Department	Civil Engineering	Assignment No.	03
Course Title	Railways, Harbors, Tunneling and Airports	Max. Marks	40
Course Code	21CV643	Date of announcement	02/06/2024
Subject Teacher	Santhosh K	Date of submission	15/07/2024
Branch/Semester	CE/VI	Modules covered	Module – 3

Q. No.	Questions	Marks	COs	BTL
	Module – 1: Simple Stresses and Strains			
01	With a neat sketch, explain the function of components of aartificial harbor.	10	CO3	L2
02	Draw the typical layout of harbour and explain the components	10	CO3	L2
03	Explain the various method of ventilation in the tunnelling	10	CO4	L2
04	Explain the Classificatiob of breakwater and write the charcteristics of mound breakwater	10	CO3	L2

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Department	Civil Engineering		Assignment No.	01ₕ
Course Title	Railways, Harbors, Tunneling and Airports		Max. Marks	10
Course Code	21CV643		Date of announcement	10/07/2024
Subject Teacher	Santhosh K		Date of submission	30/07/2024
Branch/Semester	CE/VI		Modules covered	Module – 5

Q. No.	Questions	Marks	COs	BTL
	Module – 1: Simple Stresses and Strains			
01	The max of mean and average daily kilometre on a parallel airport site are 36° C and 24° C. A runway basic length 2400m is to be located just a few meter about MSL and the proposed longitudinal gradient are 0 to 600 is +5% , 600 – 1000 is -0.3%, 1100to 1900 is 0.6%, 1900 to end is+0.2%. Determine the actual length of the runway.	10	CO4	L3

Faculty

Rubrics for the Academic year 2023-24

Subject name: Railways, Harbors, Tunneling and Airports

Subject code: 21CV643

CIE Calculation:

Internal assessment test marks –Max. 20 X 3 = 60 marks

Assignments – Max. 10 X 2 = 20 marks

Any two of Quiz / Seminar / Group Discussion = 20 Marks

Total Internal (CIE) marks are reduced to 50 Marks

SEE Calculation: As per university Scheme (for 50 marks)

Result is declared as follows:
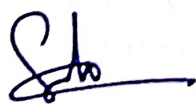
If SEE + CIE >= 40 then student is considered as PASS

If SEE + CIE < 40 then student is considered as FAIL

Rubrics for Internal Assessment test: As per the scheme of valuation.

Rubric for Quiz: MCQ with each questions caring 1 mark.

Rubrics for Assignment:

On time submission	1-5 days delay	More than 5 days delay	Not submitted	Leaving question
Full marks as per scheme	1 mark less from the total allotted marks	2 marks less from the total allotted marks	0 mark	Marks will be deducted according to the scheme

Faculty

21CV643 -Railways, Harbor, Tunneling & Airport QUIZ

* Indicates required question

1. Email *

   _____

2. Student USN *

   _____

3. Student Name *

   _____

4. The alignment of breakwater should be: *   1 point

   Mark only one oval.

   ◯ Horizontal

   ◯ Straight

   ◯ Perpendicular

   ◯ Diagonal

5. What is the diagram used to decide the runway orientation known as? *   1 point

   Mark only one oval.

   ◯ Wind Rose

   ◯ Wind Figure

   ◯ Wind Rise

   ◯ Wind velocity

6. The FAA classification of the airport is based on: *

Mark only one oval.

◯ Function
◯ Geometric design
◯ Airport approach speed
◯ Length of Runway

7. Runways are oriented in a direction against the prevailing wind. *

Mark only one oval.

◯ True
◯ False
◯ Both Above
◯ None of the above

8. The wind intensity during a calm period in runways should be: *

Mark only one oval.

◯ Below 4.6km/hr
◯ Above 5km/hr
◯ Between 5-10 km/hr
◯ Below 6.4 km/hr

9. What is the temperature at which the runway length is calculated? *

Mark only one oval.

◯ 15°C
◯ 13°C
◯ 34°C
◯ 27°C

10. Which of the following is not a type of correction done while calculating the runway * 1 point
length?

Mark only one oval.

◯ Correction for temperature

◯ Correction for elevation

◯ Correction for gradient

◯ Correction for time

11. Which of the below does not affect the site-selection of an airport site? *   1 point

Mark only one oval.

◯ Adequate access

◯ Air traffic potential

◯ Sufficient airspace

◯ Number of ground staff

12. What is the full form of IFR? *   1 point

Mark only one oval.

◯ Instrumental Flight Registration

◯ International Flight Rules

◯ Instrumental Flight Record

◯ Instrumental Flight Rules

13. The pattern of parking of the vehicles in an airport is decided by the shape and size * 1 point
of the parking area available. It is designed in a way to make sure it is as close to
the terminal building as possible. Which type of basic parking pattern is shown in
the figure?
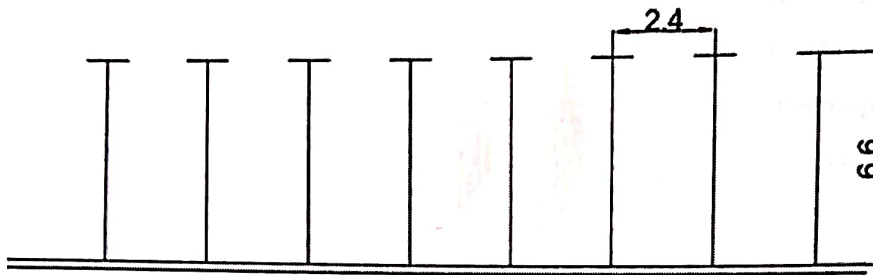
Mark only one oval.

○ Right angle parking

○ Parallel curb parking

○ Angle parking

○ Straight parking

14. Which of the following causes stresses in Sleepers? *   1 point

Mark only one oval.

○ Eccentric vertical loads

○ Contact shear stress of wheel and rail

○ Lateral deflection of sleepers

○ Track components

15. There are _____ types of rail sections. *   1 point

Mark only one oval.

○ 2

○ 3

○ 4

○ 5

16.

For holding a rail in position, no chairs are used for

*

1 point

Mark only one oval.

⬭ flat footed rails

⬭ bull headed rails

⬭ double headed rails

⬭ both (a) and (b)

17.

*

1 point

Rail section first designed on Indian railways, was

Mark only one oval.

⬭ double headed

⬭ bull headed

⬭ flat footed

⬭ (a) and (b) simultaneously

18.

*

1 point

A good sleeper should be such that ?

Mark only one oval.

⬭ the rails can be easily fixed and taken out from the sleeper without moving them

⬭ it can provide sufficient bearing area for the rail

⬭ it can provide sufficient effective bearing area on the balast

⬭ all of the above

19. Which of the following is not a component of the rail? *

1 point

Mark only one oval.

⬭ Ballast

⬭ Foot

⬭ Web

⬭ Head

20. India's first passenger train from Bori Bunder (Mumbai) to Thane was run on which * 1 point of the following gauge?

Mark only one oval.

- ⬭ Metre gauge
- ⬭ Standard gauge
- ⬭ Broad gauge
- ⬭ Narrow gauge

21. Which of the following is the most used ballast on Indian railways? *   1 point

Mark only one oval.

- ⬭ Coal ash ballast
- ⬭ Brickbat ballast
- ⬭ Broken stone ballast
- ⬭ Sand ballast

22. Railway rails are made of which of the following? *   1 point

Mark only one oval.

- ⬭ Cast iron
- ⬭ Mild steel
- ⬭ High carbon steel
- ⬭ Wrought iron

23. Which of the following is an old method for track maintenance? *   1 point

Mark only one oval.

- ⬭ Beater packing
- ⬭ Mechanised maintenance
- ⬭ Directed track maintenance
- ⬭ Measured shovel packing

24. Coning of wheels *

Mark only one oval.

○ prevent lateral movement of wheels

○ provide smooth running of trains

○ avoid excessive wear of inner faces of rail

○ all the above.

25. At a rail joint, the ends of adjoining rails, are connected with a pair of fish plates   * 1 point
and

Mark only one oval.

○ 2 fish bolts

○ 4 fish bolts

○ 6 fish bolts

○ 8 fish bolts

26. Which of the following occurs when train travels at a speed greater than equilibrium * 1 point
speed on a curve?

Mark only one oval.

○ Cant deficiency

○ Cant excess

○ Cant gradient

○ Rate gradient

27. Which of the following is the correct formula for equilibrium superelevation in   * 1 point
millimetres?

Mark only one oval.

○ e = GV2/254R

○ e = GV2/381R

○ e = GV2/127R

○ e = GV2/96R

28. As per the prescribed value, what should be the maximum value of cant excess on Broad gauge?

Mark only one oval.

- ( ) 65mm
- ( ) 75mm
- ( ) 92mm
- ( ) 100mm

29. The gradient on which an additional engine is required to negotiate the gradient, is called

Mark only one oval.

- ( ) momentum gradient
- ( ) pusher gradient
- ( ) ruling gradient
- ( ) steep gradient.

30.

Sand may be used as ballast for *

Mark only one oval.

- ( ) wooden sleepers
- ( ) steel sleepers
- ( ) cast iron sleepers
- ( ) all the above.

31. Rail section is generally designated by its *

Mark only one oval.

- ( ) total weight
- ( ) total length
- ( ) weight per metre length
- ( ) area of its cross-section.

32. On Indian Railways standard length of rails for B.G. track, is *

1 point

Mark only one oval.

◯ 33 ft (10.06 m)

◯ 36 ft (10.97 m)

◯ 39 ft (11.89 m)

◯ 42 ft (12.8 m)

33. Littoral drift *

1 point

Mark only one oval.

◯ is the raised line of sand, parallel to the sea coast

◯ is the slow movement of surface water at sea caused by the wind

◯ is a current parallel to the shore, caused due to tangential component of the wind

◯ is a current perpendicular to the shore line caused due to wind.

34. Bombay harbor will come under the classification of _____ *

1 point

Mark only one oval.

◯ Semi natural harbor

◯ Artificial harbor

◯ Natural harbor

◯ Semi artificial harbor

35.

* 1 point

The solid parallel platform in a harbour with berthing facility on one side only is:

Mark only one oval.

◯ pier

◯ quay

◯ wharf

◯ jetty

36.

The marine structure located alongside or at the entrance of a pier or a wharf is:

Mark only one oval.

- ⬭ pier heads
- ⬭ dolphins
- ⬭ breakwater
- ⬭ fenders

37. A tunnel is found more advantageous as compared to the alternate routes because * 1 point it:

Mark only one oval.

- ⬭ remains free from snow
- ⬭ reduces the cost by reducing the route distance
- ⬭ reduces the maintenance cost
- ⬭ avoids interference with surface rights
- ⬭ All the above.

38. Which one of the following linings is suitable for shield driven tunnels particularly in * 1 point the subaqueous regions :

Mark only one oval.

- ⬭ Brick lining
- ⬭ stone lining
- ⬭ timber line
- ⬭ cast iron lining

39.

* 1 point

For highways, tunnelling is preferred to if the open cut exceeds :

Mark only one oval.

- ⬭ 10 metres depth
- ⬭ 15 metres depth
- ⬭ 20 metres depth
- ⬭ 25 metres depth.

40. Tunneling is required in case of _____ *

Mark only one oval.

- ◯ Laying pavement
- ◯ Laying road
- ◯ On ground passage
- ◯ Underground passage

41. The length of the needle beam used in needle beam method of tunnelling is usually * 1 point

Mark only one oval.

- ◯ 2 m to 4 m
- ◯ 2.5 m to 6 m
- ◯ 4 m to 7 m
- ◯ 5 m to 6 m

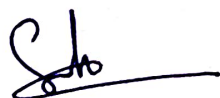42. The tunnels, the artificial underground passages are constructed for : *   1 point

Mark only one oval.

- ◯ Option 1
- ◯ highways
- ◯ railways
- ◯ sewerage
- ◯ water supply project
- ◯ All the above

Faculty.

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CIVIL ENGINEERING DEPARTMENT

Subject Name: -Railways, Harbor, Tunneling & Airport

Subject Code; 21CV643

Faculty: Santhosh K

Timestamp	Email Address	Score	Student USN	Student Name
8-8-2024 18:52:56	cprashanth743@gmail.com	39 / 39	4AL21CV007	PRASHANTH S
8-8-2024 19:01:10	4al22cv400@aiet.org.in	39 / 39	4AL22CV400	GIRISH A S
8-8-2024 19:06:51	m.pruthvi555@gmail.com	39 / 39	4AL21CV008	PRUTHVI M
8-8-2024 19:08:12	shekherlaishram3004@gmail.com	38 / 39	4AL21CV004	LAISHRAM SHEKHERCHANDRA KHUMAN
8-8-2024 19:11:24	4al21cv011@aiet.org.in	39 / 39	4AL21CV011	S V VINAYAKA BHANDARKAR
8-8-2024 19:14:38	4al22cv401@aiet.org.in	39 / 39	4AL22CV401	MEHUL V BANGERA
8-8-2024 19:16:01	4al21cv001@gmail.com	38 / 39	4AL21CV001	A DHANUSH
8-8-2024 19:26:07	bindyags2003@gmail.com	39 / 39	4AL21CV002	BINDYA G S
8-8-2024 19:27:08	rajukingannigeri143@gmail.com	38/ 39	4AL21CV009	RAJU ANNIGERI
8-8-2024 19:31:42	rashekce@gmail.com	38 / 39	4AL21CV010	RASHEK
8-8-2024 19:31:46	shreedoddamani63@gmail.com	39 / 39	4AL21CV012	SHREE DODDAMANI
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