SAMANTA CHANDRASEKHAR INSTITUTE OF TECHNOLOGY & MANAGEMENT, SEMILIGUDA

1st INTERNAL EXAMINATION
Diploma 5th Semester (Civil)
Subject: R&BE

Time:1 hr 30 minutes Total Marks:20

(Figures to the right-hand side indicates marks)

PART-A

Q1. Answer any five question. (2x5=10)

a) Define permanent way with sketch?
b) Write the advantages of railway?
c) What do you mean by super elevation or cant?
d) What is gauge ? What are different type of gauge used in I.R ?
e) A locomotive has an axle load of 20 tones? Determine the weight of the rail section?
f) What is creep of rail ?What are the different theories of creep?

PART-B

Q2. Answer any two question. (5X2=10)

a) Explain different type f rail joints with diagram?
b) Describe the function & requirement of rails?

OR

Describe the function & requirement of sleepers?

c) Explain different types of rails with diagram. Describe the advantages and disadvantages of each type?

No. AB/ 372

SCITM

SAMANTA CHANDRASEKHAR INSTITUTE OF TECHNOLOGY AND MANAGEMENT

SEMILIGUDA - 764 036

Internal Examination 6th Semester/Class

Name Nagi Buntha Branch Civil

Roll No. F1903001013 Registration No F1903001013

Subject R&BE Date 21/12/21

No. of Addl. Sheets used

20/20 23/12/2021

Manisha Mishra 21/12/21
Signature of the Invigilator

USE BOTH SIDE OF PAPER

MARKS OBTAINED

Question No.	Marks	Question No.	Marks
1. 1(a)	2 marks	6. 2(a)	5 marks
2. 1(b)	2 marks	7. 2(c)	5 marks
3. 1(c)	2 marks	8.	
4. 1(d)	2 marks	9.	
5. 1(e)	2 marks	10.	
		Total :	

Signature of the Examiner

Date 23/12/2021

(1) Answer any five from the following questions.

(a) Define permanent way with sketch?

(b) Write the advantages of railway?

(c) What do you mean by superelevation or cant? Draw a diagram of cant?

(d) What is gauge? What are the different types of gauge used in I.R?

(e) A locomotive has an axle load of 20 tonnes. Determine the weight of the rail section?

(f) What is creep of rail? What are the different theories of creep?

(2) Answer the following.

(a) Explain different type of rail joints with diagram?

(b) Describe the functions & requirements of rails?

or

Describe the function & requirements of sleepers

(c) Explain different types of rails with diagram. Describe the advantages & disadvantages of each types?

(b) ANS// (i) the railway practical all over the world Railway are chipest communication & safest & comportable (2)
easy to transport raw material

(c) ANS// $\frac{\text{weight of the rail}}{\text{locomative axle load}} = \frac{1}{510}$

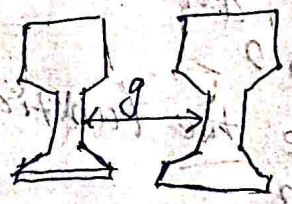
$\Rightarrow \frac{1}{510} \times 26 = 0.05$ (2)

the weight of the rail section is 0.05

(d) ANS// the gauge of the defined as a clear distance between the inner rail of two falls

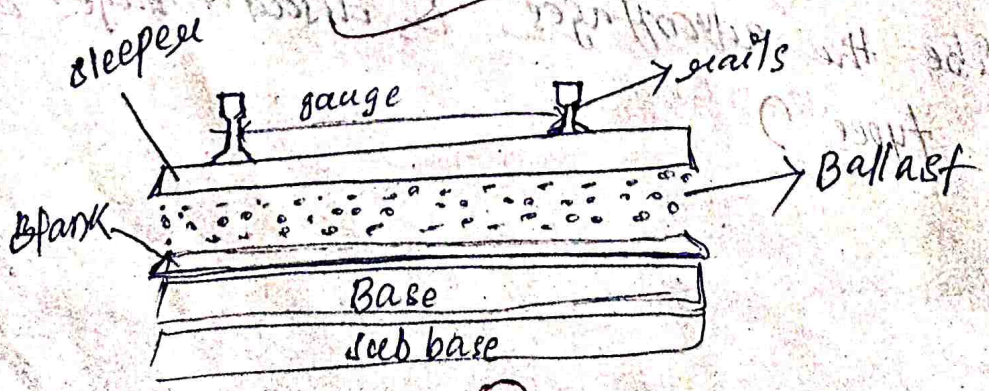
there are three types of gauge

(I) broad gauge
(II) meter gauge (2)
(III) Narrow gauge.



bu

(a) Ans// A permanent is a combination of sleepers ballast rails.



(2)

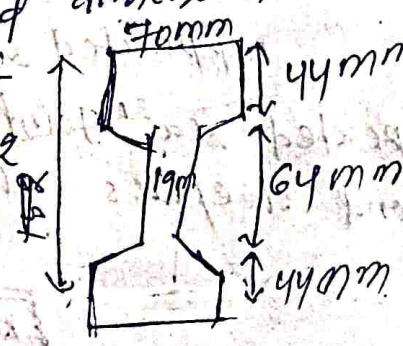
(C) Ans// ~~ac~~ counteract of affect the centrifugal force the level of the outer rail is raised above the inner rail by a certain amount to introduce the centripetal force. this Raised elevation of outer rail above the inner rail of a horizontal curve is called superelevation. (2)

(2) (a) Ans// there are three types of rail

① Double headed
② Bull headed
(3) flat footed rail.

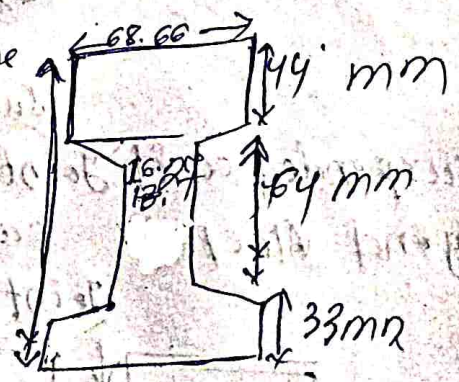
① Double headed rail
whose head are the same dimension this is called double headed rail.

→ the rail section whose ~~am~~ head dimensions are more than that of their foot are called bull headed rails



(2) Bull head rail

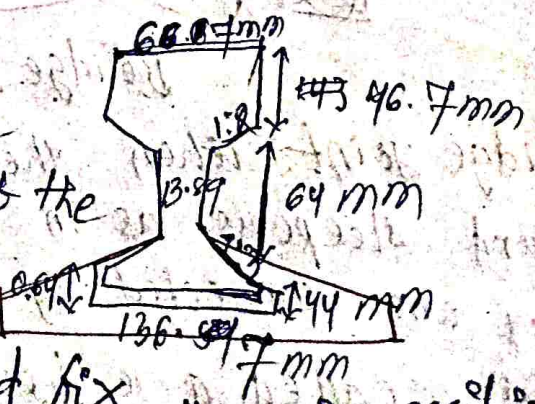
→ the rail sections having their foot rolled to the flat are called flat footed or vignoles rails



(5)

(3) Flat footed rail

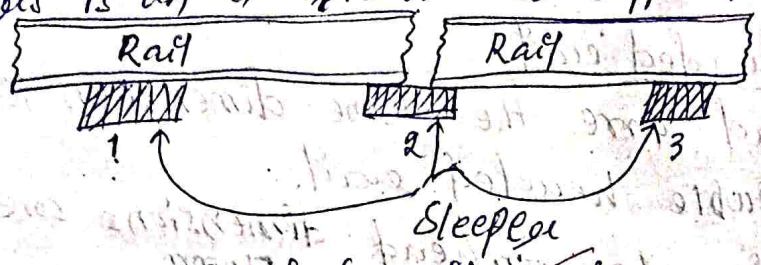
→ the sleepers are the transverse member of the track placed below the rails to supported and fix them in positions



2(a) Ans// there are 10 types of rail Joints

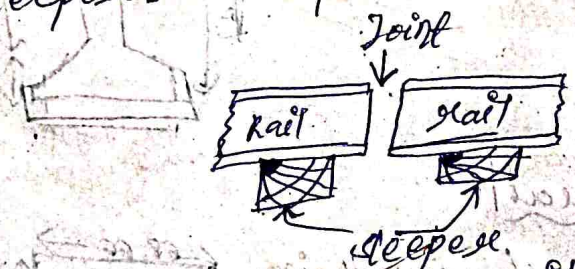
(1) supported rail joint
(2) suspe~~cted~~nded rail joint
(3) bridge rail Joint
(4) base rail joint.
(5) Even rail Joint

(1) supported rail Joints:- When the rail ends rest on a single sleeper called a " Joint sleeper " if it termedas. "supported Joint" the duplex Joint sleeper with other sleepers is an example of the supported Joint.



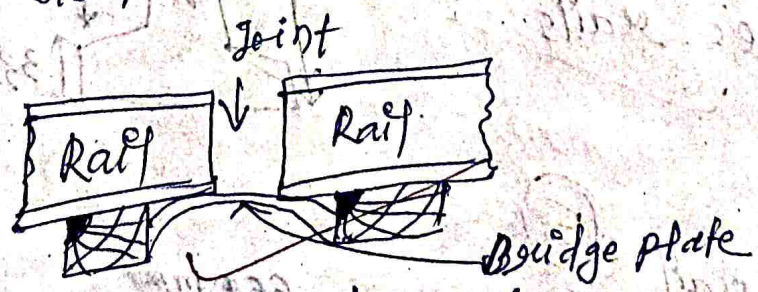
supported rail joint

supported rail Joint when rail ends are projected beyond sleepers called " shoulder sleeper "



Suspended rail Joint

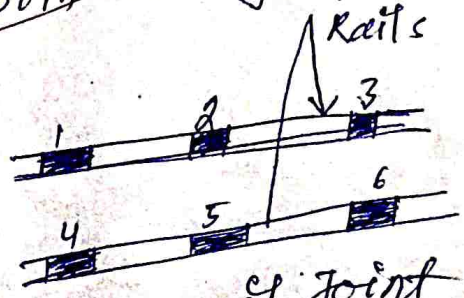
suspended rail Joint when rail end are projected beyond sleepers called suspended rail Joint.



Bridge Joint

Bridge Joint. When the rail ends are projected beyond sleepers, as in case of suspended Joint and they are connected by a ~~flat~~ flat or corrugated plate called a " bridge ~~Jo~~ plate

Base Joint. this is similar to the bridge Joint. with the different that the inner fish plates are of bar type and outer fish plates are of the special angle type. in which the horizontal leg is further extended over the sleepers to be bolted to both bridge plate and sleeper.



(5)

even rail Joint

Even Joint: in this also. the position of rail Joint is the basis of its nomenclature. the Joints of one rail track are directly opposite to the Joints of other rail track.

SAMANTA CHANDRASEKHAR INSTITUTE OF TECHNOLOGY & MANAGEMENT, SEMILIGUDA

2nd INTERNAL EXAMINATION
Diploma 5th Semester (Civil)
Subject: R&BE

Time:1 hr 30 minutes Total Marks:20

(Figures to the right-hand side indicates marks)

PART-A

Q1. Answer any five question. **(2x5=10)**

a) Define gauge of railway ? Mention different type of gauge?
b) What is ballast?
c) What is boxing and ballast crib?
d) What is creep ?What are the theory of creep?
e) What are the different type of rail joint?

PART-B

Q2. Answer the following question. **(5x2=10)**

a) Explain the function and requirement of ballast?

OR

Explain the function and requirement of sleeper?

b) Explain the function of components of a permanent way with a leveling sketch?

No. AB/ 1746

SCITM

SAMANTA CHANDRASEKHAR INSTITUTE OF TECHNOLOGY AND MANAGEMENT

SEMILIGUDA - 764 036

2nd internal Examination 5th Semester/Class

Name Nani Gurtha Branch Civil Engg

Roll No. F1903000013 Registration No F1903000013

Subject R&BE Date 19/02/2022

No. of Addl. Sheets used

Manisha Mishra 20/02/2022

good 19/20

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Signature of the Invigilator

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4. 1(d)	1mark	9.	
5. 1(e)	2marks	10.	
		Total :	

Manisha
Signature of the Examiner

Date 20/02/2022

1) Answer the following questions ? (2x5 = 10 Marks)

(a) Define gauge of a railway? Mention different types of gauge?

(b) what is ballast?

(c) what is 'Boxing & Ballast crib'?

(d) what is creep? what are the theories of creep?

(e) what are the different types of rail joint

2) Answer the questions :- (5x2 = 10 marks)

(a) Explain the functions & requirements of Ballast

or

Explain the functions & Requirements of sleeper

(b) Explain the functions of components of a permanent way with a leveling sketch?

(C) Ans// (i) Boxing :- for process of filling the ballast around the sleeper is called boxing of the ballast, this ballast boxes the sleeper. (2)

(ii) Ballast crib :- the loose ballast between the two adjacent sleepers is known as ballast crib.

(b) Ans// the sleepers are bedded and packed with granular materials such as broken stones, gravel etc. which is known as ballast. (2)

(a) Ans// the gauge of the railway track is the clear minimum vertical distance or the spacing between the inner side of the falls two rails.

there are three types of railway gauge used in india.

(a) Broad Gauge (B.G.)

(b) meter Gauge (M.G.) (2)

(c) Narrow Gauge (N.G.)

(c) Ans// The following types of joints are commonly used in indian and foreign railways.

(1) Supported rail joints
(2) Suspended rail joint
(3) Bridge joint
(4) Base joint
(5) welded rail joints
(6) Staggered or Broken joint
(7) Square or even joint
(8) compromise joint
(9) Insulated joint
(10) Expansion joint

(d) Ans// creep is defined 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 place, moves by several centimeters in a month while in other locations the movement of rails may be negligible. it is observed that the rails have tendency to move gradually in the direction of dominant traffic.

Theories of creep:- Various theories are propound to explain the different causes of creep but non of them gives the true picture for real cause (or root cause) of creep in rails the various theories propound for explaining the probable causes of creep in rails are described in following paragraph.

(a) Ans// functions and requirements of sleeper the main functions of sleepers are as follows.

(a) Holding the rails in their correct gauge and alignment

(b) Giving a firm and even support to the rails

(c) transferring the load from the rails to a wider area of the ballast.

(d) Acting ~~as~~ as an elastic medium between rails and the ballast to absorb the blows and vibrations caused by moving loads.

(e) providing longitudinal and lateral stability of the permanent way.

(f) providing the means to rectify the track geometry during their service life. apart from performing these functions the ideal sleeper should normally fulfil the following requirements

(a) the initial as well as maintenance cost should be minimum

(b) the weight of the sleeper and the fastenings should be such that it is convenient to handle.

(c) the design of the sleeper and the fastenings should be such that it is possible to fix and remove the rail easily.

(d) the sleeper should have sufficient bearing area so that the ballast under it is not crushed.

(e) the sleeper ~~should be such~~ that it is possible to maintain and adjust the gauge properly

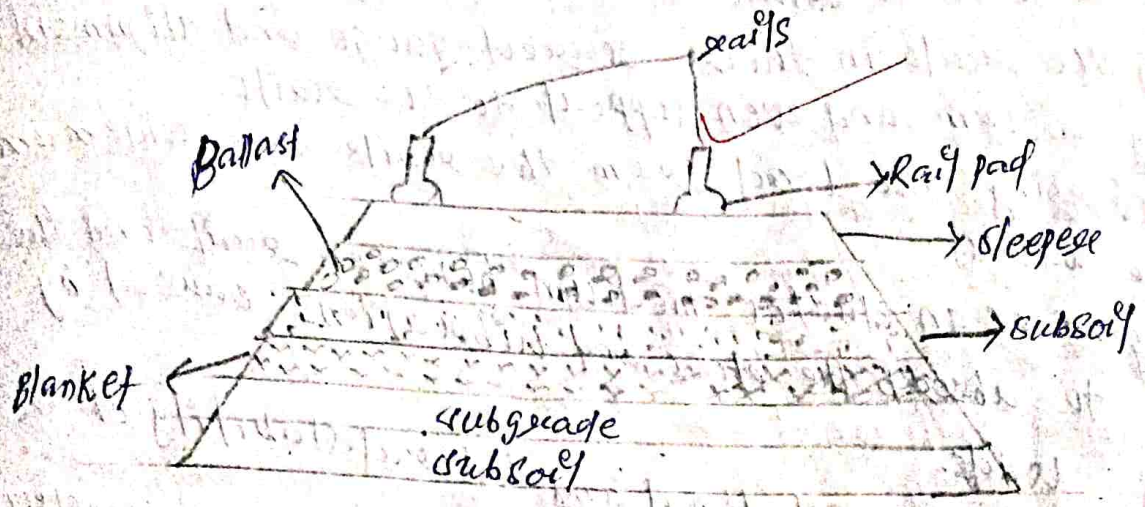
(f) the material of the sleeper and its design should be such that it does not break or get damaged during packing.

(g) the design of the sleeper should be such that it is possible to have track circuiting.

(h) the sleeper should be capable of resisting vibration and shocks caused by the passage of fast moving trains.

5

(b) Any component of a permanent way.



(I) Subgrade (II) Ballast (III) Sleepers (IV) Rails (V) fixtures & fastening in a permanent way. rails are joined either by welding or By using fish plates and are fixed with sleepers by using different types of fastening. sleepers are properly placed and packed with ballast. ballast is placed on the function of the prepared subgrade called formation function of components of permanent way.

Functions of sleepers:

(I) to hold the rail to proper gauge
(II) to transfer the loads from rails to the ballast
(III) To support and fix the rails in proper position
(IV) To keep the rails at a proper level in straight tracks and at proper super elevation on curves
(V) To provide elastic medium between the rails and the ballast
(VI) To provide stability to the permanent way on the whole.

Function of Ballast:

(I) To hold the sleepers in positions and preventing the lateral and longitudinal movement
(II) to distribute the axle load uniform from sleepers to a large area of formation
(III) To provide elasticity to the track. it acts as as

elastic mat between subgrade and sleepers.

(iv) To provide easy means of maintaining the correct levels of the two rails in a track

(v) To drain rain water from the track.

functions of fixture and fastening.

(i) To joint the rails end to end to form full length of track

(ii) to fix the rails to sleepers

(iii) To maintain the correct alignment of the track

(iv) To provide proper expansion gap between rails

(v) To maintain the required tilt of rails.

function of rails:

(i) Rails provide a continues and level surface for the movement of the trains with minimum friction with steel wheels of the rolling stock

(ii) Rails provide strength - durability and lateral guidance to the track.

(5) functions of subgrade:

the base course and subgrade are structural elements of the pavements. in conjunction with the overlying asphalt surface. their purpose is to distribute traffic wheel load over the whole foundations. to perform this function. you build the base course and subgrade with the necessary internal strength properties in this respect. full-depth asphalt pavements have a special advantage over pavements with granular bases.

Asphalt pavements layers both tensile and compressive strength to resist internal stresses.

Manish