



**I Mid Term examination**

**Session: 2017-18**

**B.Tech I Year (II Semester)**

**Subject with code: Basic Civil Engineering (CE-103)**

**SET -A**

Time: 2hrs.

M.M.:20

**Instruction for students:**

**Question paper contains two sections--**

**Sec A- compulsory (which includes 8 short answers type questions of 0.5 marks each).**

**Sec B- contains 06 Questions out of which any 04 questions to be attempt by the student (4 marks each).**

**Sec-A**

Q.1 Answer the following questions

(a) What do you mean by active responsibility of an engineer?

Sol- The responsibility of an engineer during the tenure of his work progress ( ie. When work is in progress) is termed as its active responsibility.

(b) Astronomical survey deals with.....?

Sol- Relative position of various astronomical bodies like sun, stars etc.

(c) What do you mean by enlarging scale?

Sol-

(d) Which branch of civil engineering deals with the design of highways?

Sol- Highway Engineering

(e) IRC stands for\_\_\_\_\_.

Sol- Indian Road Congress

(f) Define Hydrographic survey.

Sol- It is that branch of surveying with deals with the relative positions of various points and objects under water. ( sea, ocean, lake)

(g) If while performing survey curvature of earth is not taken into account then that type of survey is called\_\_\_\_\_.

Sol- plane surveying

(h) Longest National Highway of India is\_\_\_\_\_.

Sol- NH44

## Sec-B

Q.2 Explain the various Responsibilities of a civil engineer.

Sol-

The responsibility of a civil engineer can be broadly classify as three sub division depending upon the liability time of his work :-

- ① Before commencement of work.
- ② During the work or construction
- ③ After the <sup>completion</sup> commencement of the work or construction.

The responsibility of a civil engineers during the tenure of office work is often termed as active responsibility and the responsibility of the civil engineer after the completion of the work during the liability period (defect liability period and service liab. period) is often term as passive responsibility

## incompliance

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- ⑤ civil engineering profession recognize the reality of <sup>limiting</sup> natural resources that desire for sustainable practices and the need for the social equity in the consumption of resources.
- ⑥ The basic responsibility of a civil engineer are planning and designing and <sup>making a decision</sup> analysis of its various aspects, making a regular inspection in the site <sup>to insure that</sup> the construction is going into the plan and making the necessary amendments in the project if required during the course of construction.
- ⑦ Civil engineering as to make sure that the project is the cost effective and structure is of required strength and posses and adequate amount of safety.
- ✓ ⑧ Civil engineers hold the health, <sup>safety and</sup> welfare and safety para of public parameters.
- ⑨ Civil engineering has to ensure that is the project is <sup>do not</sup> in compliance with.
- ⑩ It is a beauty of civil engineer to insure that the structure they are building are build economically to function properly with a minimum of maintainance and repair while withstanding antcipitant uses and adverse weather condition.

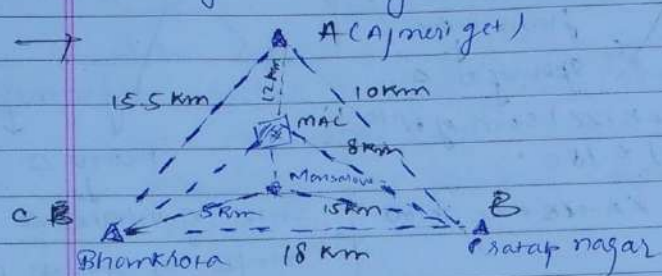
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Q.3 What are the basic principles of surveying. Explain each of them. Sol-

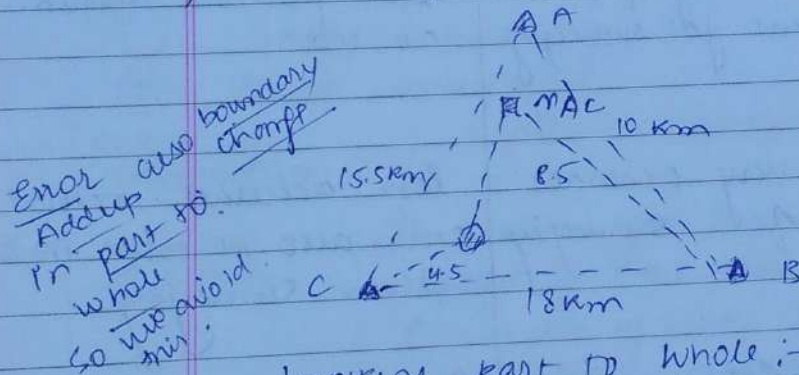
→ Principal of surveying :-

1. Always work from "whole to the part"
2. The position of new station, with reference to fixed & well defined points, should always be fixed by two independent process.



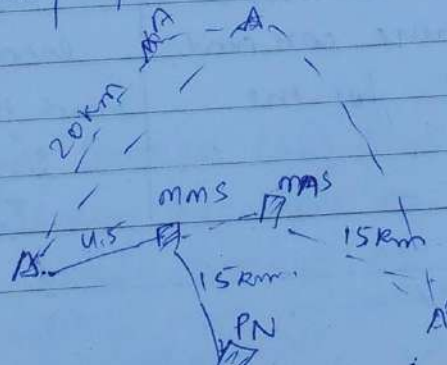
Actual graph

→ Working whole to part



localise error

Working part to whole :-

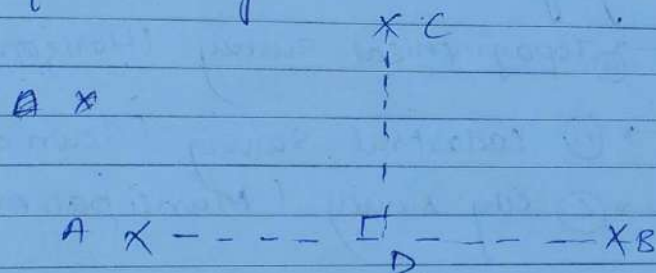


Global error

By working from 'whole to the part' we mean that the given area is first inclosed in larger framework of control points which are measured with very precise instrument and with great accuracy, it is then subdivided into smaller parts and the measurement for different objects are taken this insure that

- ① the accumulation of error will not be there and errors will be minimum.
- ② the errors will be localize therefore can be detected easily and corrected accordingly.

Let A and B are two fixed well defined point and position of C is to be obtained.



then the various processes, by which C can be fixed are following :-

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| (1) $\overline{AC}$ , $\overline{BC}$ | (7) $\overline{AD}$ , $\overline{CD}$ |
| (2) $\angle CAB$ , $\angle CBA$       | (8) $\overline{CD}$ , $\overline{DB}$ |
| (3) $\angle CAB$ , $\overline{BC}$    | (9) $\overline{AD}$ , $\overline{AC}$ |
| (4) $\angle CAB$ , $\overline{BC}$    |                                       |
| (5) $\angle CBA$ , $\overline{AC}$    |                                       |
| (6) $\angle CBA$ , $\overline{BC}$    |                                       |

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Q.4 Differentiate between plane and geodetic surveying.

Sol-

→ Basic division of survey:-

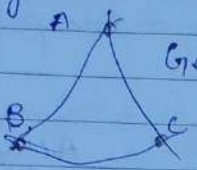
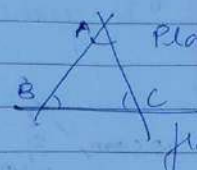
(1) Geodetic surveying

(2) Plane surveying

Point of comparison	Geodetic surveying	Plane surveying
1. curvature of earth	It accounts for curved shape of the earth. (curvature of earth is taken into consideration)	Curvature of earth is not taken into account (the area is considered as a plane area)
Area of survey	It involves large area under survey (according to american survey institute ASI the limiting area of geodetic survey is $260 \text{ km}^2$ ).	It involves small area under survey (area less than equal to $260 \text{ km}^2$ )

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to  $260 \text{ km}^2$



	<p style="text-align: right;">17-2/80 → Plane Survey</p> <p style="text-align: right;">DATE: / / PAGE NO.:</p> <p>3. <u>Frame work of Survey</u></p> <p><u>Geodetic Survey</u> The frame work consist of spherical triangles for which <del>sum</del> <sup>sum</sup> of internal angles are not equal to <math>180^\circ</math>. (actually greater than <math>180^\circ</math>)</p>  <p style="text-align: center;">Geodetic survey frame work ↓ spherical <math>\Delta</math></p> <p style="text-align: center;"><math>\angle A + \angle B + \angle C</math> (sum of interior angle) <math>\neq 180^\circ</math> actually <math>\angle A + \angle B + \angle C &gt; 180^\circ</math></p>	<p><u>Plane Survey</u> The frame work consist of plane <math>\Delta</math> the sum of interior angles of which <sup>interior angle</sup> is exactly equal to <math>180^\circ</math>.</p>  <p style="text-align: center;">Plane surveying ↓ framework ↓ plane <math>\Delta</math> ↓ Sum of interior <math>\Delta</math> of angle of which <math>180^\circ</math></p>
<p>4. <u>Type of Instrument use</u></p>	<p>In this we <del>It</del> <sup>It</sup> uses very precise instrument for surveying</p>	<p>less precise instrument are use</p>
<p>5. <u>Accuracy</u></p>	<p>It uses very accurate method of surveying</p>	<p>less accurate method can also be used in plane surveying</p>
<p><u>Feasibility</u></p>	<p>It requires more skills, more cost and more time for the surveying.</p>	<p>It has less skilled labour, less labour and therefore overall less cost.</p>

Q.5 Explain Structural engineering in detail.

① Structural engineering:- Str. eng. is among the oldest <sup>discipline</sup> engineering

- Struct. eng. is that branch of engineering which deal with the design and construction of various infrastructural and

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Montmorillonite → found in Black  
(clay mineral) cotton soil responsible for its  
swelling and shrinkage property.

infrastructural related facility like design  
construction of residential building,  
dam etc.

- In broad <sup>sense</sup> term, if we say structural engineering can be defined as the field of civil engineering which focuses on the frame of structure and on designing those structure to withstand the stresses and pressures of the environment and remain safe, stable and secure through out the service.

Q.6 Classify various types of survey based on the objective of surveying and based on the types of instruments used for surveying.

Sol- Based on the objective-

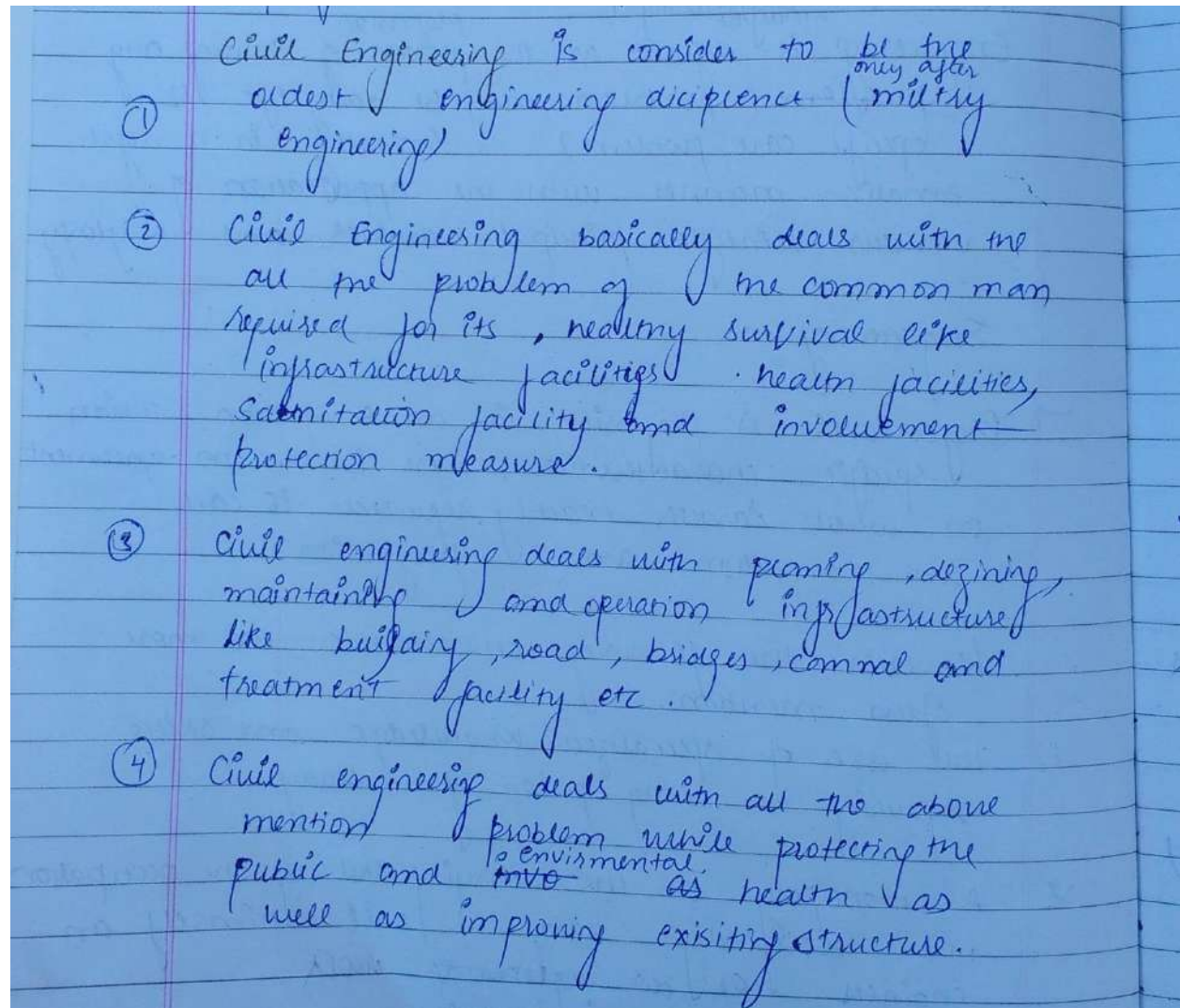
1. Engineering Survey
2. Military Survey
3. Mine survey
4. Geological survey
5. Archeological survey

Based on Instrument-



- 1.Chain
- 2.compass
- 3.Theodolite.
- 4.Tacheometric
- 5.Plane Table

Q.7 Discuss the role of Civil Engineer in society.

- 
- ① Civil Engineering is considered to be the oldest engineering discipline (military engineering) <sup>only after</sup>
  - ② Civil Engineering basically deals with the all the problems of the common man required for its healthy survival like infrastructure facilities, health facilities, sanitation facility and environment protection measure.
  - ③ Civil engineering deals with planning, designing, maintaining and operation of infrastructure like building, road, bridges, canal and treatment facility etc.
  - ④ Civil engineering deals with all the above mentioned problem while protecting the public and <sup>environmental</sup> ~~into~~ as health as well as improving existing structure.

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(11)

A civil engineer should always encourage energy conservation during the course of construction and maintenance of structure.

Ex. United Nations Development Program (UNDP) and all the other national governments of the world are promoting green building system.

Green building is a building which requires minimum energy for its construction and operation from outside sources and generates its energy <sup>from</sup> itself.

LEED & IGBC are various commonly used green building.

Mamipal University in Jaipur has first IGBC green building.

(12)

The civil engineer should ensure no hazardous free cost while providing healthy, safe and good environment to the society.

Ex. use of PPE (Personal Protection Equipment)