



17310

14115

3 Hours/100 Marks

Seat No.

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- Instructions :**
- (1) **All** questions are **compulsory**.
 - (2) Answer **each** next main Question on a **new** page.
 - (3) Illustrate your answers with **neat** sketches **wherever** necessary.
 - (4) Figures to the **right** indicate **full** marks.
 - (5) Assume **suitable** data, **if necessary**.
 - (6) **Use** of Non-programmable Electronic Pocket Calculator is **permissible**.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are **not permissible** in Examination Hall.

MARKS

1. a) Attempt **any six** of the following :

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- i) State the Principles of Survey.
- ii) State the two uses of survey based on geodetic surveying.
- iii) Give any four codes of signals used to direct assistant in ranging.
- iv) Define : WCB and Quadrantal Bearing System.
- v) How would you detect presence of local attraction at a place ?
- vi) State the situation where plane table is suitable.
- vii) Define :
 - 1) Bench mark,
 - 2) Datum surface
 - 3) Line of collimation
 - 4) Change point.
- viii) Define fly levelling and profile levelling.

b) Attempt **any two** of the following :

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- i) Differentiate between plane surveying and geodetic surveying.
- ii) Draw conventional symbols for the following :
 - a) Pucca building
 - b) Lake
 - c) Embankment
 - d) Church.
- iii) The down hill end of the 30 m tape is held 80 cm too low, what is horizontal length ?

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MARKS

2. Attempt **any four** of the following :

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- a) Explain indirect ranging with neat sketch.
- b) Explain the method of chaining on a sloping ground.
- c) Length of a survey line measured with a 30 meter chain was found to be 1000 meter. At the end of survey, the chain was compared with a standard chain, it was found to be 0.15 meter too long. Find correct length of the line.
- d) What are offsets ? How are they taken and recorded ? Explain with sketch.
- e) What considerations would you have while selecting survey stations and survey lines in a chain survey ?
- f) Describe with neat sketch, the optical square and explain its principle.

3. Attempt **any four** of the following :

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- a) Prepare a page of field showing chain line with following details.
 - i) Length of base line 100 m.
 - ii) A electric pole 25 m perpendicular from chainage 20 m at left.
 - iii) The corner of building are 40 m and 55 m from chainage 60 m and 80 m to the right of chain.
- b) Convert the following R.B. to W.C.B.
 - i) $N40^{\circ}30'W$
 - ii) $S 49^{\circ}30'E$
 - iii) $S 43^{\circ}30'W$
 - iv) $N 45^{\circ}00'E$
- c) Draw a neat sketch of Prismatic compass and label its component parts.
- d) Find the back bearing of the following lines.
 - i) $AB - N48^{\circ}E$
 - ii) $EF - 270^{\circ}30'$
 - iii) $CD - S 58^{\circ}30'W$
 - iv) $GH - 180^{\circ}$
- e) What is meant by closing error ? Explain graphical method of adjustment of closing errors.
- f) Give the differences between closed and open traverse survey.



MARKS

4. Attempt **any four** of the following :

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- a) The following bearings were taken in traverse survey conducted with a prismatic compass at a place where local attraction was suspected.

At what station do you suspect local attraction ? Find the correct bearings of the line.

Line	Fore Bearing	Back Bearing
AB	44°30'	226°30'
BC	124°30'	303°15'
CD	181°00'	1°0'
DA	289°30'	108°45'

- b) What are the sources of errors in plane tabling.
 c) State advantages and disadvantages of plane table survey.
 d) State any four accessories of plane table with their uses.
 e) What is meant by orientation of plane table ? Explain any one method.
 f) Draw a neat sketch of dumpy level and name all parts.

5. Attempt **any four** of the following :

16

- a) Define the following :
 i) Height of instrument ii) Back sight
 iii) Fore sight iv) Axis of bubble tube.
- b) State the fundamental axes and mention their relationship for a dumpy level.
 c) Differentiate between collimation plane method and rise and fall method.
 d) What are the advantages of auto level ?
 e) Explain importance of Bench mark in levelling and state types of bench mark.
 f) The following consecutive reading were taken with a dumpy level and 4 m levelling staff on continuously sloping ground A to B at every 30 m interval. 0.355 m on A, 0.730, 1.055, 2.690, 3.950, 0.485, 1.020, 1.895, 2.535. The R.L. of A was 560.250 m. Prepare page of level book and check your calculation by usual method. Determine the gradient of the line AB.

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MARKS

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6. Attempt **any two** of the following :

a) 1) Describe with neat sketch :

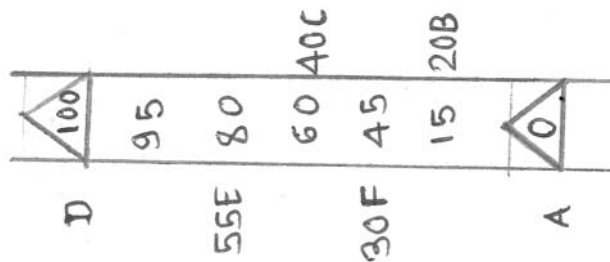
i) Base line

ii) Check line

iii) Tie line

iv) Tie station

2) Plot the given cross staff survey of a field ABCDEFA and calculate its area in sq.m.



b) The following bearings have been observed while carrying out a closed compass traverse in clockwise direction.

Line	Observed	
	F.B.	B.B.
AB	285°30'	105°30'
BC	32°00'	210°00'
CD	149°00'	331°30'
DA	198°30'	18°00'

Calculate the error due to local attraction and find corrected bearing and also compute the included angles.

c) The series of staff reading observed on a continuously sloping ground are 0.850, 1.650, 2.450, 3.255, 0.655, 1.250, 1.955, 2.650, 3.250, 1.150, 1.655, 2.055 and 3.255.

The first reading was taken on a B.M. of R.L 150.000 calculate the R.L's of all points by collimation plane method. Apply usual checks. Show tabulation.