SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF AGRICULTURE ENGINEERING

QUESTION BANK

III SEMESTER

1902303 SURVEYING AND LEVELLING
Regulation – 2019
Academic Year 2021 – 2022

Prepared by

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SUBJECT : SURVEYING AND LEVELLING
SEM / YEAR : III/II

UNIT-I: FUNDAMENTALS AND CHAIN SURVEYING

Definition- Classifications - Basic principles – Equipment and accessories for ranging and chaining – Methods of ranging - well conditioned triangles – Errors in linear measurement and their corrections - Obstacles - Traversing – Plotting – applications- enlarging and reducing figures- Areas enclosed by straight lines - Irregular figures- digital Planimeter.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Define Surveying.	BT-1	Remembering
2.	Name the instruments/accessories needed to carry out a chain surveying.	BT-4	Analysing
3.	Classify surveying based on the instruments used.	BT-5	Evaluating
4.	List the different cumulative errors in chain surveying.	BT-2	Understanding
5.	Discuss ranging. Mention its types.	BT-1	Remembering
6.	What is the difference between map and plan	BT-5	Evaluating
7.	What do you mean by geodetic surveying?	BT-2	Understanding
8.	State the principles of surveying.	BT-1	Remembering
9.	What is the purpose of an Optical Square?	BT-4	Analysing
10.	How do you fix a point from the control points?	BT-3	Applying
11.	Define Representative Fraction	BT-1	Remembering
12.	Under what circumstances the reciprocal ranging is used?	BT-3	Applying
13.	List out some code of signals used while ranging.	BT-2	Understanding
14.	Define compensating error.	BT-1	Remembering
15.	What is meant by well-conditioned triangle?	BT-4	Analysing
16.	The length of a line measured with a 20m chain was found to be 250 metres. Calculate the length of the line if the chain was 10 cm too long.	BT-5	Evaluating
17.	What do you understand by the term plotting?	BT-2	Understanding
18.	How will you correct errors in tape which occurs due to change in temperature?	BT-4	Analysing
19.	What is meant by sag correction?	BT-2	Understanding

20.	What is traversing?	BT-4	Analysing
21.	Who are leader and follower when a line is being chained?	BT-3	Applying
22.	Draw a neat sketch to show a) base line b) check line c) tie line	BT-6	Creating
23.	List out the methods followed to enlarge and reduce the figures.		
24.	Define Simpson's rule.	BT-1	Remembering
25.	What is the use of digital planimeter?	BT-3	Applying

PART – B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	i) List out the various objectives of surveying? (7) ii) Explain in detail about the primary divisions of surveying. (6)	BT-2	Understanding
2.	Prepare a list of accessories required for a chain survey? Explain the functions of each.	BT-1	Remembering
3.	A tape 20 m long of standard length at 84ºF was used to measure a line, the mean temperature during measurement being 65º. The measured distance was 882.10 metres, the following being the slopes. 2º10' for 100 m 4º12' for 150 m 1º6' for 50 m 7º48' for 200m 3º0' for 300 m 5º10' for 82.10 m Find the true length of the line if co-efficient of expansion is $65x10^{-7}$ per 1ºF.	BT-5	Evaluating
4.	i) Describe principles of surveying. (6) ii) Describe briefly about ranging by line ranger. (7)	BT-3	Applying
5.	i) A surveyor measured the distance between two points on the plan drawn to a scale of 1cm = 40m and the result was 468 m. Later he discovered that he used a scale of 1 cm = 20 m. Find the true distance between these two points. (6) ii) A 20 m chain used for a survey was found to be 20.10 m at the beginning and 20.30 m at the end of the work. The area of the plan drawn to a scale of 1cm = 8m was measured with the help of a planimeter and was found to be 32.56 sq.cm. Find the true area of the field. (7)	BT-5	Evaluating
6.	Explain in detail about the various error that occurs during chaining.	BT-6	Creating

7.	Write down the formula for a) Correction for absolute length in tape. b) Correction for temperature in tape c) Correction for pull in tape d) Correction for sag in tape	BT-1	Remembering
8.	Calculate the sag correction for 30m steel under a pull of 100N in 3 equal spans of 10m each. Weight of one cubic cm of steel= 0.078 N. Area of cross section of tape = 0.08sq.cm	BT-5	Evaluating
9.	i) Discuss briefly about field work. (5) ii) Write short notes on instruments used for setting out right angles. (8)	BT-4	Analysing
10.	What are the obstacles encountered in chaining. Explain them	BT-4	Analysing
11.	Explain in detail about plotting of chain survey.	BT-2	Understanding
12.	In chain traversing, how will you set out 30º and 60 º angle?	BT-3	Applying
13.	Discuss about enlarging and reducing figures.	BT-2	Understanding
14.	With a neat sketch explain about digital planimeter.	BT-1	Remembering

PART-C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain in detail about the various classifications of surveying.	BT-1	Remembering
2.	A steel tape 20m long standardised at 55ºF with a pull of 10 kg was used for measuring a base line. Find the correction per tape length, if the temperature at the time of measurement was 80 ºF and the pull exerted was 16 kg. Weight of 1 cubic cm of steel = 7.86 g, weight of tape = 0.8 kg and E= 2.109 x 10^6 kg/cm^2. Coefficient of expansion of tape per 1 ºF=6.12x 10^{-6}	BT-5	Evaluating
3.	Describe about direct and indirect ranging with a neat sketch	BT-4	Analysing
4.	Explain in detail about the various methods to compute the area enclosed by straight lines and irregular figures.	BT-3	Applying

UNIT-II: COMPASS AND PLANE TABLE SURVEYING

Compass – Basic principles - Types - Bearing – Systems and conversions – Sources of Errors - Local attraction - Magnetic declination-Dip-Traversing - Plotting - Adjustment of closing error – applications - Plane table and its accessories - Merits and demerits - Radiation - Intersection-Resection – Traversing- sources of errors – applications.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Define compass surveying.	BT-1	Remembering
2.	What is meant by traverse?	BT-4	Analysing
3.	Define Meridian	BT-1	Remembering

4.	Define Foresight.	BT-1	Remembering
5.	Distinguish between True Meridian and Magnetic Meridian	BT-4	Analysing
6.	How the designation of bearings is done?	BT-5	Evaluating
7.	Distinguish between true bearing and magnetic bearing.	BT-2	Understanding
8.	Discuss the term bearings and its types.	BT-3	Applying
9.	Calculate the reduced bearing values for the whole circle bearings 150° and 270°.	BT-3	Applying
10.	Change the following whole circle bearing to reduced bearing: (a) 151° 20’ (b) 332° 40’.	BT-3	Applying
11.	Write about datum.	BT-1	Remembering
12.	Define Benchmark and give its types.	BT-1	Remembering
13.	Define back bearing.	BT-1	Remembering
14.	Distinguish between dip and declination	BT-4	Analysing
15.	What is local attraction?	BT-2	Understanding
16.	What are the sources of local attraction?	BT-2	Understanding
17.	Name some of the accessories used in plane table surveying?	BT-1	Remembering
18.	Under what circumstances the plane table surveying is adopted?	BT-4	Analysing
19.	What is meant by the term orientation in plane table surveying?	BT-2	Understanding
20.	Name some of the errors in plane table surveying.	BT-4	Analysing
21	What are the advantages of plane table surveying?	BT-1	Remembering
22	What is the use of trough compass in plane table surveying?	BT-4	Analysing
23	What are the methods of plane tabling?	BT-6	Creating
24	What is resection in plane tabling?	BT-2	Understanding
25	Define two point problem.	BT-1	Remembering

PART – B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Distinguish between Prismatic Compass and Surveyor’s compass	BT-4	Analysing
2.	The following Interior angles were measured with a theodolite in a closed traverse. The Bearing of the line AB was measured as 60°00’ with a prismatic compass. Calculate the bearings of all other line if ∠A= 140°10, ∠B = 90°8’, ∠C = 60°22’, ∠D= 69°20’	BT-5	Evaluating
3.	The following bearings were observed with a compass. Calculate the interior angles. LINE F.B AB 60° 30’ BC 122°0’ CD 46° 0’ DE 205° 30’ EA 300°0’	BT-5	Evaluating

4.	The following bearings were observed while traversing with a compass. Mention which stations were affected by local attraction and determine the corrected bearings. LINE F.B B.B AB 45° 45’ 226°10’ BC 96°55’ 277° 5’ CD 29°45’ 209°10’ DE 324° 48’ 144° 48’	BT-4	Analysing
5.	Discuss about the errors in compass survey.	BT-4	Analysing
6.	Describe briefly about Prismatic Compass	BT-1	Remembering
7.	Convert the following fore bearing into back bearing i) 135° 45’ ii) 29°45’ iii) N29°10’E iv) S24° 48’W	BT-6	Creating
8.	The bearings were taken on closed compass traverse ABCDEA as **LINE F.B B.B** AB 107° 15’ 287°15’ BC 22°00’ 202° 00’ CD 281°30’ 101°30’ DE 189° 15’ 9° 15’ EA 124° 45’ 304° 45’	BT-5	Evaluating
9.	Discuss in detail about the adjustments of Surveyor’s compass.	BT-2	Understanding
10.	Brief about the various instruments in plane table surveying	BT-1	Remembering
11.	Discuss the merits and demerits of plane table surveying.	BT-2	Understanding
12.	Write short notes on i) Radiation ii) Intersection	BT-2	Understanding
13.	List the various types of errors in plane table surveying and also state then precautionary measures to overcome them	BT-3	Applying
14.	Explain about traversing method in plane table surveying.	BT-3	Applying

PART-C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain any two methods of plane table surveying with a neat sketch.	BT-1	Remembering

2.	The following bearings were observed in running a closed traverse **LINE** **F.B** **B.B** AB 75° 05’ 254°20’ BC 115°20’ 296°35’ CD 165°35’ 345°35’ DE 224° 50’ 44°05’ EA 304° 50’ 125°05’ At what stations do you suspect the local attraction? Determine the correct magnetic bearings. If declination was 5°10’E. what are the true bearings?	BT-4	Analysing
3.	The following bearings were taken on a closed compass traverse **LINE** **F.B** **B.B** AB 80° 10’ 259°0’ BC 120°20’ 301° 50’ CD 170°50’ 350°50’ DE 230° 10’ 49° 30’ EA 310° 20’ 130° 15’ Compute the interior angles and correct them for observational errors. Assuming the observed bearing of the line CD to be correct. Adjust the bearing of the remaining sides.	BT-5	Evaluating
4.	Explain the method of conducting two point problem in the field.	BT-6	Creating

UNIT-III: THEODOLITE AND MODERN SURVEYING

Theodolite - Types - Description - Horizontal and vertical angles - Temporary and Permanent adjustments – Heights and distances– Tangential and Stadia Tacheometry - Subtense methods - Stadia constants - Anallactic lens - Traversing – Gale’s table - Total Station- GIS- Global Positioning System (GPS).

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	What is meant by Theodolite?	BT-2	Understanding
2.	Define transit.	BT-1	Remembering
3.	List out the steps in temporary adjustments of theodolite surveying.	BT-2	Understanding
4.	Label the fundamental axis of Theodolite.	BT-1	Remembering
5.	What is meant by centering of a Theodolite?	BT-4	Analysing
6.	How do you eliminate parallax in Theodolite?	BT-4	Analysing

7.	What is meant by spire test?	BT-2	Understanding
8.	Distinguish between face left and face right observations in Theodolite traversing?	BT-2	Understanding
9.	What are the two methods of measuring the horizontal angle using a Theodolite?	BT-4	Analysing
10.	Define subtense Theodolite.	BT-1	Remembering
11.	List the errors which are eliminated in measurement of horizontal angles by repetition method.	BT-5	Evaluating
12.	Differentiate between latitude and departure.	BT-2	Understanding
13.	Compare theodolite and tacheometer	BT-4	Analysing
14.	Define anallactic lens.	BT-1	Remembering
15.	What is meant by total station?	BT-1	Remembering
16.	Define Satellite	BT-1	Remembering
17.	State the applications of GPS.	BT-3	Applying
18.	Distinguish between Space and User segment?	BT-2	Understanding
19.	Define Orbit	BT-1	Remembering
20.	List out the errors in total station.	BT-4	Analysing
21	What are the fundamental measurement taken using total station?	BT-4	Analysing
22	Define GPS	BT-1	Remembering
23	Write down the principles of GPS	BT-3	Applying
24	Write any two advantages of total station.	BT-3	Applying
25	List the different segments of GPS	BT-2	Understanding

PART – B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	The tacheometer was set up at a station A and the readings on a Vertically held staff at B were 2.255, 2.605 and 2.955, the line of sight being at a inclination of +8º 24'. Another observation on the Vertically held staff at B.M gave the readings 1.640, 1.920 and 2.200, the inclination of the line of sight being +1º 6'. Calculate the horizontal distance between A and B, the elevation of B if the R.L of B.M is 418.685 m. The constant of the instruments were 100 and 0.3	BT-5	Evaluating
2.	Explain the principle of stadia tachometry. How will you determine the stadia constants?	BT-5	Evaluating
3.	Recommend the various methods of measuring horizontal angle using a theodolite	BT-4	Analysing
4.	Derive an expression for the determination of horizontal and vertical distance using tangential method i) when both angles are angles of elevation.	BT-6	Creating

5.	To determine the multiplying constant of a tacheometer, the following observations were taken on a staff held vertically at a distance measured from the instrument Obs. Horizontal distance vertical angle Staff intercept 1 50m +3º 48' 0.500m 2 100m + 1º 06' 1.000m 3 150m + 0º 36' 1.500m The focal length of the object glass is 20 cm and the distance from the object glass to turnnion axis is 10 cm. The staff is held vertically at all these points. Find the multiplying constant.	BT-3	Applying
6.	Discuss about the temporary adjustments of a theodolite.	BT-4	Analysing
7.	Derive the distance and Elevation Formulae for Staff held normal by Tacheometry, when the line of sight is at an angle of elevation.	BT-6	Creating
8.	Find up to what vertical angle, sloping distances may be taken as horizontal distance in stadia work, so that the error may not exceed 1 in 400. Assume that the instrument is fitted with an anallactic lens and the staff is held vertically.	BT-5	Evaluating
9.	Explain the permanent adjustment of theodolite?	BT-4	Analysing
10.	Elaborate in detail the History of GPS and Technical Specifications of its orbits	BT-4	Analysing
11.	What are the space, control and user segments of GPS and their functions?	BT-2	Understanding
12.	Illustrate the fundamental measurement system of total station.	BT-4	Analysing
13.	List out the features of total station and merits and demerits of total station	BT-3	Applying
14.	(i) What are the types of GPS receivers? ii) Explain the task of control segment in GPS	BT-2	Understanding

PART-C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain the essential parts of theodolite?	BT-2	Understanding
2.	Derive the distance and Elevation Formulae for Staff held vertical by Tacheometry, when Both the observed angles are angle of elevation and angle of depression.	BT-6	Creating
3.	Explain the various types of GPS devices and their uses.	BT-4	Analysing
4.	Write an Essay on future of GPS Tracking systems.	BT-6	Creating

UNIT IV LEVELLING

Level line - Horizontal line - Datum - Bench marks -Levels and staves - temporary and permanent adjustments – Methods of leveling - Fly levelling - Check levelling - Procedure in levelling - Booking -Reduction - Curvature and refraction - Reciprocal levelling - sources of

errors in leveling- Precise levelling - Types of instruments - Adjustments – Field procedure.

PART – A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Define levelling.	BT-1	Remembering
2	Define Benchmark and give its types.	BT-1	Remembering
3	What is meant by Turning Point in Levelling?	BT-2	Understanding
4	List the different types of levelling staves.	BT-4	Analysing
5	What is meant by M.S.L?	BT-4	Analysing
6	Define vertical plane	BT-1	Remembering
7	List out the types of levelling instruments.	BT-4	Analysing
8	What is meant by R.L?	BT-2	Understanding
9	Write about datum.	BT-2	Understanding
10	Differentiate between internal focusing telescope and external focusing telescope.	BT-2	Understanding
11	What is the difference between tribarch and trivet?	BT-4	Analysing
12	Define fore sight	BT-1	Remembering
13	Compare simple levelling and differential levelling	BT-3	Applying
14	Distinguish between level line and horizontal line.	BT-4	Analysing
15	What is Dumpy level?	BT-2	Understanding
16	What is meant by Height of collimation?	BT-2	Understanding
17	What is meant by check levelling?	BT-4	Analysing
18	Discuss about ball and socket arrangement in level.	BT-5	Evaluating
19	What is meant by G.T.S benchmarks?	BT-2	Understand
20	List out the methods of levelling.	BT-1	Remembering
21	Define back sight.	BT-1	Remembering
22	What is reciprocal levelling?	BT-2	Understanding
23	Find the correction for curvature for a distance of 2.5 km	BT-5	Evaluating
24	Define sensitiveness of bubble tube.	BT-1	Remembering
25	List out the personal errors in levelling.	BT-4	Analysing

PART B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 meters. Enter the above readings in a page of level book and evaluate the R.L. of points if the first reading was taken with a staff held on a bench mark of 432.384 m.	BT-5	Evaluating
2	Discuss briefly about the methods of levelling.	BT-1	Remembering

3	i) Define Bench mark. Describe the different types of bench marks. (6) ii)Compare the rise and fall and line of collimation method. (7)	BT-2	Understanding
4	Write short notes on levelling instruments	BT-2	Understanding
5	Find the combined correction for curvature and refraction for a distance of a) 3500 metres b) 1.25 km c) 215 km	BT-4	Analysing
6	Describe the profile levelling and cross sectional levelling.	BT-1	Remembering
7	Discuss briefly about the temporary adjustments of a level.	BT-2	Understanding
8	The following consecutive readings were taken with a level and 5 meter levelling staff on continuously sloping ground at a common interval of 20 metres: 0.385, 1.030, 1.925, 2.825, 3.730, 4.685, 0.625, 2.005, 3.110 and 4.485. The reduced level of the first point was 208.125 m. Calculate the reduced levels of the points by rise and fall method and also the gradient of the line joining the first and the last point	BT-3	Applying
9	The light house is visible just above the horizon at a certain station at the sea level. The distance between the station and the light house is 50 km. Find the height of the light house.	BT-5	Evaluating
10	In order to find the difference in elevation between two points A and B , a level was set upon the line AB, 60 metres from A and 1280 metres from B. The readings obtained on staff kept at A and B was 0.545m and 3.920m respectively. Find the true difference in elevation between A and B.	BT-5	Evaluating
11	Illustrate about the personal errors in levelling.	BT-4	Analysing
12	Find the correction for curvature and for refraction for a distance of a)1500 meters b) 3.5 km c) 400 km	BT-4	Analysing
13	Describe the effects of curvature and refraction in Levelling	BT-4	Analysing
14	Write short notes on the following terms a)Horizontal plane b) Vertical line c) Benchmark d) Line of collimation e) Height of instrument f) Datum	BT-1	Remembering

PART – C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	What are the different sources of error in levelling and explain them in detail	BT-2	Understanding
2	The following reading were taken with a dumpy level when the instrument is midway between two pegs A and B100 mts apart. The staff reading on A= 3.345 m. The staff reading on B = 2.025 m. (b) when the instrument is kept very near A. The staff reading on A = 2.950 m. The staff reading on B= 2.000m. Is the instrument in adjustment or not? When the instrument is very near to A. What should be the correct reading on staff B?	BT-3	Applying
3	An observer standing on the deck of a ship just sees a light house. The top of the light house is 42 metres above the sea level and the height of the observer's eye is 6 metres above the sea level. Find the distance of the observer from the light- house.	BT-5	Evaluating

4.	Explain the working of a dumpy level with a sketch. What are the various temporary adjustments?	BT-4	Analysing

UNIT-V: LEVELLING APPLICATIONS

Longitudinal and Cross-section-Plotting - Contouring - Methods – Characteristics and uses of contours- Plotting – Methods of interpolating contours – computation of cross sectional area and volumes - Earthwork calculations - Capacity of reservoirs - Mass haul diagrams.

PART – A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Define contour.	BT-1	Remembering
2	Sketch the contours for a) hill b) pond	BT-3	Applying
3	Write down any two uses of contour maps.	BT-2	Understanding
4	What do you mean by contour interval?	BT-2	Understand
5	Write down the formula for calculating contour interval.	BT-6	Creating
6	Write down the Prismoidal formula for finding out the volume using a contour map.	BT-6	Creating
7	How will you analyze the capacity of the reservoir?	BT-4	Analysing
8	What is meant by balancing line in Mass diagram?	BT-2	Understanding
9	What if the contour line crosses a valley at right angles or a stream?	BT-4	Analysing
10	List out the interpolation methods of contouring.	BT-4	Analysing
11	Define the term contour gradient.	BT-1	Remembering
12	What is meant by catchment area?	BT-2	Understanding
13	What do you understand from the term water shed line?	BT-2	Understanding
14	Write down the trapezoidal rule for calculating volume.	BT-6	Creating
15	What is meant by contouring?	BT-2	Understanding
16	What is meant by average Haul distance?	BT-2	Understanding
17	Define lead and lift in Mass diagram	BT-1	Remembering
18	State the limitations of Prismoidal formula.	BT-4	Analysing
19	How contour interval depends upon the scale of the contour map?	BT-4	Analysing
20	Define cross sectioning and its applications.	BT-2	Understanding
21	Calculate the contour interval on a map having the scale of 1: 40.000.	BT-5	Evaluating
22	Define Haul distance	BT-1	Remembering
23	List out the methods of indirect contouring.	BT-2	Understanding
24	What is the difference between free haul distance and over haul distance?	BT-4	Analysing
25	Define Mass Haul diagram	BT-1	Remembering

PART-B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	An embankment of width 8 m and side slopes 1.5:1 is required to be made on the ground which is levelled in a direction transverse to the centre line. The centre height at 24 m intervals is as follows 0.80, 1.42, 1.90, 2.20, 2.65, 2.20, 2.20, 1.65, 1.30 and 0.90. Calculate the volume of earthwork to be carried out informing the embankment.	BT-5	Evaluating
2	What considerations would you have while selecting the contour interval?	BT-4	Analysing
3	Discuss briefly about direct method of locating contours.	BT-1	Remembering
4	What is meant by interpolation of contours? Explain any two methods in detail.	BT-2	Understanding
5	Explain about longitudinal and cross section method.	BT-2	Understanding
6.	Describe the indirect methods of locating contours.	BT-4	Analysing
7	From a topograph map, the areas enclosed by contour lines for a proposed dam are given below. Estimate the volume of water that can be impounded in this location Contour: 300 305 310 315 320 Area(ha) 20 110 440 930 1120	BT-5	Evaluating
8	Discuss briefly about the uses of Mass Haul diagram.	BT-2	Understanding
9	Explain how you would determine the capacity of a reservoir using a contour map	BT-3	Applying
10	What are the general methods of determining areas? Explain any two.	BT-2	Understanding
11	A road embankment 10m wide at the formation level, with side slopes of 2 to 1 and with an average height of 5m is constructed with an average gradient 1 in 40 from contour 220m to 280m. Find the volume of earthwork.	BT-5	Evaluating
12	A railway embankment 400 m long is 12m wide at the formation level and has the side slope 2 to 1. The ground levels at every 100m along the centre line are as follows. Distance: 0 100 200 300 400 R.L 204.8 206.8 207.5 207.2 208.3 The formation level at zero chainage is 207.00 and the embankment has a rising gradient of 1 in 100. The ground is level across the center line. Calculate the volume of earthwork.	BT-5	Evaluating
13	Compare direct and indirect methods of locating contours.	BT-4	Analysing
14	Explain briefly about the construction of Mass Haul Diagram	BT-1	Remembering

PART – C

<table>
<tr><th>Q.NO</th><th>QUESTIONS</th><th>BT LEVEL</th><th>COMPETENCE</th></tr>
<tr><td>1.</td><td>Discuss the various characteristics and uses of contours with suitable examples</td><td>BT-4</td><td>Analysing</td></tr>
<tr><td>2.</td><td>A sand hill within the areas of contour line at the site for the reservoir and along the face of the proposed dam as given below
<table><tr><td>Contour</td><td>152</td><td>150</td><td>148</td><td>146</td><td>144</td><td>142</td><td>140</td><td>138</td><td>136</td></tr><tr><td>Area (m^2)</td><td>300</td><td>510</td><td>620</td><td>740</td><td>580</td><td>720</td><td>570</td><td>630</td><td>900</td></tr></table>Take 152m and 136m as top of the sand hill and bottom level of the reservoir respectively, find
a) Volume of soil to be removed from sand hill by Trapezoidal method
b) Volume of soil to be removed from sand hill by Prismoidal method</td><td>BT-5</td><td>Evaluating</td></tr>
<tr><td>3.</td><td>Explain in detail about the construction, characteristics and uses of MASS- HAUL diagram.</td><td>BT-2</td><td>Understanding</td></tr>
<tr><td>4.</td><td>Describe a contour line? What is the importance of contour maps in civil engineering works?</td><td>BT-3</td><td>Applying</td></tr>
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