SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Surveying (16CE105) **Course & Branch**: B.Tech - CE **Year & Sem:** II-B.Tech & I-Sem **Regulation:** R16

UNIT –I

PRINCIPLES OF SURVEYING, ANGLES, AZIMUTHS, BEARING AND TYPES OF SURVEYING

1. a) Briefly explain the principles of surveying? 5M
   b) Write short notes on types of errors. 5M
2. Explain in detail the classifications of surveying. 10M
3. a) Briefly explain the methods of obstacles in chaining. 5M
   b) A steel tape was exactly 30 m long at 20°C when supported throughout its length under a pull of 98N. A line was measured with this tape under a pull of 147N and at a mean temperature of 32°C and found to be 780 m long. The cross-sectional area of the tape = 0.03 cm^2, and its total weight = 6.8N. For steel $\propto$ = 11 X 10^{-6} per ˚C and E for steel = 20.58 X 10^6 N/cm^2. Compute the true length of the line if the tape was supported during measurement (i) at every 30 m (ii) at every 15 m. 5M
4. With neat sketch, explain the prismatic compass or surveyor compass. 10M
5. At what stations do you suspect local attraction? Find the correct bearings of lines and also compute the included angles. 10M

LINE	FORE BEARING	BACKBEARING
AB	66°20’	246°20’
BC	139°30’	318° 50’
CD	189°40’	11°20’
DA	300°30’	119° 30’

6. Explain with neat sketch the radiation and intersection method in plane table surveying. 10M
7. Explain two-point problem and three-point problem with sketches. 10M
8. a) Briefly explain the various accessories (any three) in chain surveying. 5M
   b) What is local attraction and how it is detected and eliminated? 5M
9. What are the different tape correction and how they are applied? 10M
10. Define
    i. Magnetic meridian and true meridian. 2M
    ii. Whole circle bearing and reduced bearing. 2M
    iii. Dip and declination. 2M
    iv. Closed traverse and open traverse. 2M
    v. Fore bearing and back bearing. 2M

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UNIT –II

LEVELING AND CONTOURING

1. a). Write short notes on methods of leveling. 5M
   b). Briefly explain the temporary adjustment of leveling. 5M
2. a). Write short notes on errors in leveling 5M
   b). Discuss the effects of curvature and refraction in leveling. 5M
3. What are the indirect methods of locating a contour? Write about any two method.10M
4. Describe in detail how you would proceed in the field for (i) profile leveling
   (ii) reciprocal leveling. 10M
5. The following staff readings were observed successively with level, the instrument has been moved forward after the second, fourth and eighth readings: 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030 and 3.765. The first reading was taken with the staff held upon a benchmark of elevation 132.135m. Enter the readings in level book-form and reduce the levels. Apply the usual checks. Find also the difference in level between the first and the last points. 10M
6. The following consecutive readings were taken with a dumpy level and 4 m leveling staff on a continuously sloping ground at common intervals of 30 m 0.905 (on A), 1.745, 2.345, 3.125,3.725, 0.545, 1.390, 2.055, 2.955, 3.445, 0.595, 1.015, 1.850,2.655, 2.945(on B). The RL of A was 395.500 m. Tabulate the page of field book and calculate the levels of the points. 10M

7. The following readings have been taken from a page of an old level book. It is required to reconstruct the page. Fill up the missing quantities and apply the usual checks. 10M

Station	BS	IS	FS	Rise (+)	Fall (-)	RL	Remark
1	3.125					?	B.M
2	?		?	1.325		125.505	CP
3		2.320			0.055	?	
4		?		?		125.850	
5	?		2.655		?	?	CP
6	1.620		3.205		2.165	?	CP
7		3.652			?	?	
8			?			123.090	T.B.M

8. a) Define contour. State the various characteristics of contour lines. 5M

b) Mention the uses of contour in civil engineering works? 5M

9. a) In leveling between two points A and B on opposite sides of a river, the level was set up near A and the staff readings on A and B were 2.642 and 3.228m respectively. The level was then moved and set up near B, the respective staff readings on A and B were 1.086 and 1.664. Find the true difference level of A and B. 5M

b) Write short notes on difficulty in leveling. 5M

10.a) Differentiate between back sight and foresight. 2M

b) Define contour interval and horizontal equivalent. 2M

c) What is a bench mark? Describe different types of bench marks. 2M

d) Write a note on self reading staff. 2M

e) Define contour gradient. 2M

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UNIT –III

THEODOLITE AND TACHEOMETRIC SURVEYING

1. a) Write the temporary adjustments of a theodolite 4M
   b) How do you measure horizontal angle between two points with the help of a theodolite by repetition method? 6M
2. a) Give a list of the permanent adjustments of a transit theodolite. 4M
   b) What are the different errors in theodolite work? How are they eliminated? 6M
3. Write about parts of the Transit Theodolite. Explain in detail. 10M
4. For the following traverse, compute the length CD, so that A, D and E may be in one straight line. 10M

Line	Length(m)	Bearing
AB	110°	83°12´
BC	165°	30°42´
CD	?	346°06´
DE	212°	16°18´

5. Determine the R.L of the top of a temple from the following data. Station A and B are in line with the top of the temple. 10M

Inst Station	Reading on BM(m)	Vertical Angle	R.L of BM
A	1.085	10°48´	R.L of BM = 150.000m AB=50 m
B	1.265	7°12´	

6. Derive an expression to find the height of an object by double plane method. 10M
7. a) What is an analytical lens? Establish the basic equation for an analytic lens. 5M
   b) What is tacheometry? What are different systems of tacheometric measurements? 5M
8. a) Find the horizontal and vertical distances by tangential method when both angles are angles of elevation. 6M
   b) How would you, determine the constants K and C of a Tacheometer. 4M
9. The following readings were taken by a tacheometer with the staff held vertical. The tacheometer is fitted with Analytic lens and the multiplying constant is 100. Find out the horizontal distance from A to B and the R.L of B. 10M

Inst.station	Staff station	Vertical angle	Staff readings	Remarks
A	BM	-6º00'	1.100,1.153, 2. 060.	R.L. of B.M = 976.000
	B	8°00'.	0.982, 1.105, 1.188	

10. The vertical angles to vanes fixed at 0.5m and 3.5m above the foot of the staff held vertically at a point were - 00° 30’ and + 10 °12’ respectively. Find the horizontal distance and the reduced level of the point, if the level of the instrument axis is 125.380meters above datum.

10M

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UNIT –IV

CURVES

1. a) Write short notes on types of circular curves. 6M
   b) Define degree of curve. Derive a relation between the radius and degree of a curve. 4M
2. Explain various elements of a simple curve with a neat sketch. 10M
3. a) Define and draw a typical compound curve. Under what circumstance compound curves are provided. 4M
   b) Derive the expression for the elements of a compound curve. 6M
4. Mention the various methods of setting out of simple curve. Explain with sketch offsets from long chord method in detail. 10M
5. Describe with sketch the method of setting a simple circular curve by Rankine's deflection angle method. 10M
6. a) Write short notes on reverse curves. 4M
   b) Briefly explain the field procedure of setting out of curve by two theodolite methods. 6M
7. Two tangents intersect at chainage 1250 m. The angle of intersection is 150^0. Calculate all data necessary for setting out a curve of radius 250 m by the deflection angle method. The peg intervals may be taken as 20 m. prepare a setting out table when the least count of the Vernier is 20". Calculate the data for field checking. 10M
8. Two straight lines AC and CB, to be connected by a 3^0 curve, intersect at a chainage of 2760 m. The WCBs of AC and CB are $45^0$30' and $75^0$30' respectively. Calculate all necessary data for setting out the curve by the method of offsets from the long chord. 10M
9. A compound curve is made up of two arcs of radii 380 m and 520 m. The deflection angle of the combined curve is 105^0 and that of the first arc of radius 380 m is 58^0. The chainage of the first tangent point is 848.55 m. find the chainage of the point of intersection, common tangent point, and forward tangent point. 10M
10. Two tangents AB and BC intersect at a point B at chainage 150.5 m. calculate all the necessary data for setting out a circular curve of radius 100 m deflected angle 30^0 by the method of offsets from the long chord. 10M

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UNIT –V

ELECTRONIC DISTANCE MEASUREMENTS

1. a) List out and explain the properties of EM waves.	5M
b) State and brief about transit time.	5M
2. a) Explain in detail about the infrared type of EDM instrument.	6M
b) Write short notes on total stations.	4M
3. Explain with sketch the principle of EDM instrument.	10M
4. Briefly explain the types of EDM instrument.	10M
5. How will you measure the horizontal angle and vertical angle by using total station?	10M
6. Describe in detail about the following EDM instruments. (i) Microwave instrument (ii) Visible light instrument.	10M
7. a) Explain about AM and FM modulation.	5M
b) What is modulation? Explain the necessity of modulation.	5M
8. Define the following terms.	
i. Cycle.	2M
ii. Frequency.	2M
iii. Wave length	2M
iv. Period.	2M
v. Phase of a wave.	2M
9. Explain in detail about the Wild T-1000 Electronic Theodolite.	10M
10.Describe with sketch, the fundamental measurement of angles and distances by total station.	10M

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UNIT –I

PRINCIPLES OF SURVEYING, ANGLES, AZIMUTHS, BEARING AND TYPES OF SURVEYING

1. The main principle of surveying is to work from [ ]
   A) higher level to the lower level B) lower level to the higher level
   C) part to whole D) whole to part
2. The survey in which the curvature of the earth is taken into account is called [ ]
   A) Geodetic survey B) plane survey
   C) Preliminary survey D) Hydrographic survey
3. The effect of the curvature for the earth's surface is taken into account only if the extent of survey is more than [ ]
   A) 100km^2 B) 260km^2 C) 195.5km^2 D) 300km^2
4. Systematic errors are those errors [ ]
   A) which cannot be recognized
   B) whose characters is not understood
   C) whose effect are cumulative and can be eliminated by adopting suitable methods
   D) which change rapidly
5. Which type of survey is to be carried for laying out plots and construction streets, water supply systems and sewers [ ]
   A) Topographical survey B) Cadastral Survey
   C) City Survey D) Engineering Survey

6. For locating an inaccessible point with the help of only a plane table, one should use [ ]
   A) traversing B) resection C) radiation D) intersection
7. With which of the following instruments it is possible to set out lines at an angle of 45^0 [ ]
   A) Open cross staff B) French cross staff

C) Optical square D) Site square

8. The method of orienting a plane table with two inaccessible points is known as [ ]
A) Intersection B) resection C) back sighting (D)two-point problem

9. The method of plane tabling commonly used for dealing objects from a single Instrument station [ ]
A) Radiation B) IntersectionC) Resection D) Traversing

10. Chain Survey is well adopted for [ ]
A) Small Surveys in open ground B) Small surveys with ups and downs
C) Large area with simple details D) Long area with crowded details

11. While measuring a line between two stations A and B intervened by a raised ground, [ ]
A) The vision gets obstructed B) The chainage gets obstructed
C) vision and chainage both gets obstructed D) None of the above

12. Which of the following is an obstacle to chaining but not to ranging? [ ]
A) River B) Hillock C) Building D) None of the above

13. The correction for sag is [ ]
A) always additive B) always subtractive C) always zero
D) sometimes additive and sometimes subtractive

14. Correction for slope is given by [ ]
A) $h^2/2L$ B) h/L C) h/2L D) $2h^2/L$

15. Locating the position of a plane table station with reference to three known points, is known as [ ]
A) Radiation method B) Intersection method C) Traversing D) Three-point problem

16. A 30 m metric chain is found to be 10 cm too short throughout a measurement. If the distance measured is recorded as 300 m, what is the actual distance? [ ]
A) 300.1 m B) 301.0 m C) 299.0 m D) 310.0 m

17. The width of a river can be determined by [ ]
A) running a random line across the river
B) running some survey line on the near bank of river
C) running survey lines on the far bank of river
D) vision free and chaining across possible

18. If the chain is too long, the measured length of a line is [ ]
A) less than its true length B) greater than is true length
C) equal to its true length D) unrelated to its true length

19. A chain is standardized with a pull of 100 N but during the measurement of a line, pull of 190N is applied. The error in the length of line is [ ]

(A) $\left(\frac{P-P_0}{LE}\right)$L B) $\left(\frac{P-P}{AE}\right)$L C) $\left(\frac{P_0-P}{LE}\right)$A D) $\left(\frac{P-P_0}{LA}\right)$E

20. Reciprocal ranging is employed when [ ]

A) the two ends of a line are not inter visible.
B) one end of a line is inaccessible .C) both the ends are inaccessible.
D) the ends of the line are not visible even from intermediate points.

21. The temperature correction and pull correction [ ]

A) may have same sign. C) always have same sign.
B) always have opposite signs. D) always have positive sign.

22. The sag corrections on hills [ ]

A) is positive. B) is negative.
C) may be either positive or negative. D) is zero

23. In the whole circle system, the bearing may have any value between: [ ]

A) 0^0 to 360^0 clockwise B) 0^0 to 360^0 anti-clockwise
C) 0^0 to 90^0 clockwise D) 0^0 to 90^0 anti-clockwise

24. The F.B of a line 262^0. Its back bearing is: [ ]

A) 172^0 B) 180^0 C) 352^0 D) 82^0

25. If the fore-bearing of a line is S 45^0 45' E, then the back bearing will be: [ ]

A) 330^0 45' B) N 29^0 15' W C) S 45^0 45' E D) S 150^0 45' W

26. The plotting of small areas which can be commanded from a single station, is usually done on the plane table by the method of [ ]

A) Radiation B) Intersection C) Traversing D) Resection

27. The equivalent quadrantal bearing of the W.C.B of 22^0 30' is: [ ]

A) N 57^0 30' W B) N 22^0 30' EC) S 57^0 30' W D) N 22^0 30' W

28. The Phenomenon by which a magnetic needle is deflected by the presence of masses of iron or steel is called [ ]

A) dip B) declination C) local attraction D) magnetic bearing

29. A source of local attraction for prismatic compass is: [ ]

A) wooden pole B) masonry well C) keys D) mallet

30. Due to local attraction, incorrect readings are obtained from the prismatic compass. The reason could be [ ]

A) local people are attracted to the work

B) the survey is attracted by the local people

C) the instrument is distributed by the wind

D) the instrument is disturbed by the presence of high voltage current pole

31. In a closed traverse ABCDEA the sum of the interior angles is [ ]

A) 4 X 90^0 B) 5 X 90^0 C) 6 X 90^0 D) 7 X 90^0

32. The sum of exterior angles in closed traverse is equal to [ ]

A) 540^0 B) $(2n + 4)90^0$ C) $(2n – 4)90^0$ D) 360^0

33. The bearing of a lien AB is 283^0 15’ and the bearing of another line AC is 5^0 45’. The included angle is [ ]

A) 289^0 0’ B) 277^0 30’ C) 82^0 30’ D) 90^0 0’

34. The method of surveying in which field work and plotting work are done simultaneously, is called [ ]

A) Compass surveying B) Levelling C) Plane table surveying D) Chain surveying

35. The magnetic bearing of a line AB is 132^0 00’. What is the true bearing of the line if the magnetic declination is 8^0 30’ E. [ ]

A) 124^0 0’ B) 140^0 30’ C) 230^0 30’ D) 132^0 30’

36. If he respective bearings of lines OA and OB are 31^0 45’ and 149^0 15’ from station ‘O’, the value of angle AOB is equal to [ ]

A) 181^0 0’ B) 62^0 15’ C) 61^0 31’ D) 117^0 30’

37. The purpose of providing a brass counterweight on one of the straight arms of circular disc of the compass is [ ]

A) to identify the owner of the instrument B) to prevent declination

C) to balance the effect of dip of the needle D) to show the north side of the compass

38. The horizontal angle which the magnetic meridian makes with the true meridian is known as [ ]

A) declination B) local attraction C) dip D) back bearing

39. The lines passing through points at which the declination is zero are called [ ]

A) Parallel lines B) Curved lines C) Agonic lines D) Isogonic lines

40. The line drawn through the points of same declination is known as [ ]

A) Agonic lines B) Contour line C) isogonic lines D) Line of sight

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UNIT –II

LEVELING AND CONTOURING

1. The method of surveying used for determining the relative height of points on the surface of the earth is called [ ]
   A) leveling B) simple leveling C) longitudinal leveling D) differential leveling
2. A surface which is normal to the direction of gravity at all points, as indicated by a plumb line, is known as [ ]
   A) datum surface B) level surface C) horizontal surface D) vertical surface
3. An arbitrary surface with reference to which the elevation of points are measured and compared, is called [ ]
   A) datum surface B) level surface C) horizontal surface D) vertical surface
4. A line normal to the plumb line at all points is known as [ ]
   A) horizontal line B) vertical line C) level line D) line of collimation
5. The vertical distance above or below the datum is called [ ]
   A) reduced level of the point B) elevation of the point
   C) height of the instrument D) either A) or ((B)
6. A back sight indicates the…….of the instrument. [ ]
   A) shifting B) setting up C) height D) none of the above
7. A fixed point of reference of known elevation is called [ ]
   A) change point B) station point C) bench mark D) datum
8. An imaginary line tangential to the longitudinal curve of the bubble tube at its middle point is called [ ]
   A) axis of telescope B) axis of level tube C) level line D) line of collimation
9. A staff reading taken on a bench mark or a point of known elevation is called [ ]
   A) fore sight-reading B) back sight reading C) intermediate sight D) any one of these
10. A staff reading taken on a point whose elevation is to be determined as on a change point is called [ ]
    A) fore sight-reading B) back sight reading C) intermediate sight D) none of these
11. To find the true difference of level between two points, the level should be kept [ ]
    A) at either of the two points B) exactly midway between the two points
    C) at any point on the line joining the two points D) none of the above
12. For accurate work, the lengths of back sight and fore sight are kept unequal [ ]

A) agree B) disagree C) either (A) or (B) D) none of the above

13. The reduced level of the plane of collimation is ……..height of instrument [ ]
A) equal to B) less than C) greater than D) none of these

14. The height of instrument is equal to [ ]
A) reduced level of bench mark + back sight B) reduced level of bench mark + fore sight
C) reduced level of bench mark + intermediate sight D) back sight + fore sight

15. A method of differential leveling is used in order to find the difference in elevation between two points when [ ]
A) they are too far apart B) there are obstacles between them
C) the difference in elevation between them is too great D) all of these

16. The collimation method for obtaining the reduced levels of points provides a check on [ ]
A) fore sights B) back sights C) change points D) intermediate sights

17. The rise and fall method for obtaining the reduced levels of points provides a check on [ ]
A) fore sights only B) back sights only C) intermediate sights only D) all of these

18. Collimation method is used in [ ]
A) profile leveling B) differential leveling C) check leveling D) both A) and ((B)

19. Rise and fall method is used in [ ]
A) profile leveling B) differential leveling C) check leveling D) none of these

20. The method of leveling in which the heights of mountains are found by observing the temperature at which water boils is known as [ ]
A) Barometric leveling B) reciprocal leveling C) longitudinal leveling D) hypometry

21. Which of the following statement is correct? [ ]
A) In leveling, the effect of curvature is to decrease the staff reading
B) The effect of refraction in leveling is to increase the staff reading
C) The combined effect of curvature and refraction in leveling is to increase the staff reading
D) all of the above

22. In leveling, the effect of refraction may be taken as……f that due to curvature[ ]
A) One-half B) one-third C) one-fifth D) one-seventh

23. In leveling, the correction for curvature (in meters) is equal to [ ]
A) 0.00785 D^2 B) 0.0785 D^2 C) 0.0112 D^2 D) 0.0673 D^2
Where D= Distance from the level to the staff reading in kilometers.

24.In leveling, the correction for combined curvature and refraction (in metres) is equal to [ ]
A) 0.00785 D^2 B) 0.0785 D^2 C) 0.0112 D^2 D) 0.0673 D^2
Where D= Distance from the level to the staff reading in kilometers.

25. The error which is not completely eliminated in reciprocal leveling is [ ]
A) error due to curvature B) error due to refraction
C) error due to non-adjustment of the line of collimation
D) error due to non-adjustment of bubble tube

26. The line joining the points having the same elevation above the datum surface, is called a [ ]
A) contour surface B) contour line C) contour interval D) contour gradient
27. The contour interval depends upon the [ ]
A) nature of the ground B) scale of map C) purpose and extent of survey D) all of these
28. The vertical distance between any two consecutive contours is called [ ]
A) vertical equivalent B) horizontal equivalent C) contour interval D) contour gradient
29. The horizontal distance between any two consecutive contours is called [ ]
A) vertical equivalent B) horizontal equivalent C) contour interval D) contour gradient
30. The contour lines can cross one another on map only in the case of [ ]
A) a vertical cliff B) a valley C) a ridge D) an overhanging cliff
31. When several contours coincide, it indicates [ ]
A) a vertical cliff B) a valley C) a ridge D) a saddle
32. The datum adopted for India is the [ ]
A) MSL at Madras B) MSL at Bombay C) MSL at Karachi D) Delhi
33. The BM established by survey of India is known as [ ]
A) Permanent BM B) GTS BM C) Arbitrary BM D) none
34. The surface of still water is considered to be [ ]
A) Level B) Horizontal C) Smooth D) hard
35. The surface tangential to a level surface is said to be a [ ]
A) Vertical surface B) horizontal surface C) ground surface D) None
36. The line of collimation and the axis of the telescope should be [ ]
A) Coincide B) be parallel C) be perpendicular D) none
37. The length of the staff with telescopic leveling staff [ ]
A) 3.5m B) 4m C) 5m D) 10m
38. When there is a relative movement between the cross hair and staff reading it is known as
A) Parallax B) collimation error C) refraction error D) reflection error [ ]
39. The staff reading taken on a point of known elevation is [ ]
A) FS Reading B) BS Reading C) IS Reading D) None
40. The internal focusing telescope is focused by moving [ ]
A) Convex lens B) double concave lens C) planoconvex lens D) None

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UNIT –III

THEODOLITE AND TACHEOMETRIC SURVEYING

1. The size of a theodolite is defined by [ ]

   A) The diameter of the graduated circle of lower plate B) The length of the telescope
   C) The diameter of the graduated circle of upper plate D)The height of the telescope

2. The operation consisting of revolving the telescope through 180^0 in a vertical plane about its horizontal axis is called [ ]

   A) Transiting B) Face right C) Face left D) Traversing

3. The operation of revolving the telescope in a horizontal plane about its vertical axis is called

   A) Swinging B) Transiting C)Face right D) Face left [ ]

4. Theodolite is an instrument used for [ ]

   A) Measurement of bearings only B) Measurement of horizontal angles only
   C) Measurement of vertical angles only D) All the above

5. A telescope is said to be normal or direct if its [ ]

   A) Vertical circle is to the left of the observer and the bubble is up
   B) Vertical circle is to the left of the observer and the bubble is down
   C) Vertical circle is to the right of the observer and the bubble is down
   D) Vertical circle is to the right of the observer and the bubble is up

6. Removal of parallax may be achieved by [ ]

   A) Refocusing the objective B) Refocusing the eyepiece
   C) Refocusing the eyepiece and the objective D) Moving the shifting centre

7. For which of the following permanent adjustment of a theodolite is the spire test used?

   A) Adjustment of plate levels B) Adjustment of line of sight [ ]
   C) Adjustment of horizontal axis D) Adjustment of altitude bubble and vertical index frame

8. Right deflection angle may be directly obtained by setting the instrument to read

   A) Zero on back station B) 180^0 on back station [ ]
   C) 90^0 on back station D) 270^0 on back station

9. Accurate measurement of deflection angles with the transit not properly adjusted are made by

   A) Setting the Vernier A to read zero at the back station and then plunging the telescope

B) Setting the Vernier A to read zero at the back station and then turning the instrument to the forward station

C) Taking two back sights, one which the telescope normal and the other with the telescope inverted

D) Taking back sight with the face left [ ]

10. The bubble tube parallel to the telescope of a theodolite should be more sensitive, since it controls [ ]

A) Vertical axis B) horizontal axis C) axis of bubble tube D) none

11. Which one of the following statements is correct? [ ]

A) The axis of plate level should be parallel to the vertical axis

B) The axis of striding level must be parallel to the horizontal axis

C) The axis of the altitude level must be perpendicular to the line of collimation

D) The line of collimation must be perpendicular to the plate level axis

12. The shifting head in the theodolite serves to [ ]

A) Move the instrument from place to place B) Level the plate levels quickly

C)Focus the objective quickly D) Set up quickly over station mark

13.The graduations on the scale plate of the theodolite will be made from 0^0 to [ ]

A) 360^0 in the clockwise direction B)360^0 in the anticlockwise direction

B) 180^0 both in clockwise and anti-clockwise direction D)90^0 in each quadrant

14.The size of theodolite is indicated by the size of the [ ]

A) Object glass B) Telescope used

C) Vertical circle used D) Graduated circle of the lower plate

15. The lower plate of the transit is attached to the [ ]

A) Outer axis B) Inner axis

C) Horizontal axis D) Axis of the plate bubble

16. The purpose of providing tangent screws in theodolite is to facilitate [ ]

A) Accurate leveling B) Accurate centering

C) Fine adjustment D) all the above

17. In a theodolite, the least count of the Vernier is 20 seconds and the value of one main scale division 20 minutes. The index of the vernier lies between $80^020'$ and $80^040'$. The 17^{th} division of the vernier coincides with the main scale. The value is [ ]

A)$80^025'40"$ B) $80^025'25"$ C) $80^020'17"$ D) $80^020'37"$

18. The inner axis of the theodolite is attached to [ ]

A) The telescope B) Scale plate

C) Vernier plate D) Vertical circle

19. The axis of the main plate level of the theodolite is fixed [ ]

A) Parallel to the trunnion axis B) Perpendicular to the trunnion axis
C) On the telescope D) On the tee-frame

20. To bisect a signal, the telescope is raised or lowered by manipulating the [ ]
A) Focusing screw B) eye-piece C) vertical circle clamp D) clip screw

21. Transiting the telescope can be done by turning the telescope through [ ]
A) 180^0 over its horizontal axis B) 360^0 over its horizontal axis
C) 180^0 over its vertical axis D) 360^0 over its vertical axis

22. The angle made by the direction of a traverse line with that of the previous line produced is known as [ ]
A) Direct angle B) Included angle C) Exterior angle D) Deflection angle

23. Balancing traverse means [ ]
A) Calculating consecutive co-ordinate
B) Correcting consecutive co-ordinates for errors of closure
C) Making all lines of traverse equal in length
D) Locating a point at the same distance from all lines

24. Bowditch rule for adjusting a traverse is adopted when [ ]
A) Angular measurements are more precise than linear measurements
B) Angular measurements are less precise than linear measurements
C) Angular measurements and linear measurements are defective
D) Angular measurements and linear measurements are equally precise

25. Tacheometry eliminates the need to make [ ]
A) Linear measurements B) Angular measurements
C) both linear and angular measurements D) any measurements

26. The essential feature of a tacheometer is it has [ ]
A) Transiting facility B) A striding level C) An analytic lens D) A shifting head

27. When the bottom and top horizontal wires of the diaphragm remain at the same distance for all observations, the method of tacheometry used is known as [ ]
A) Movable hair method B) Fixed hair method
C)Sub tense method D) Tangential method

28. When a tacheometer has an analytic lens, its [ ]
A) Multiplying constant will be 100 B) Multiplying constant will be 0
C) Additive constant will be 100 D) Additive constant will be 0

29. An analytic lens in the telescope of the tacheometer will serve to [ ]
A) Brighten the image of the staff B) Bisect staff accurately
C) Increase additive constant D) Eliminate additive constant

30. Tacheometric method of surveying is [ ]
A) Rapid and accurate B) Rapid and inaccurate
C) Slow but convenient D) Rapid and convenient

31. A sub tense bar is used in [ ]
A) Fixed hair tacheometry B) Movable hair tacheometry
C) Tangential tacheometry D) All types of tacheometry

32. The method of tacheometry in which two vertical angles are required to be measured for the same station is [ ]
A) Tangential method B) Constant hair method

C) Movable hair method D) Sub tense method

33. Tangential tacheometry can be carried out with [ ]
A) Chain and tape B) Dumpy level C) Transit and staff D) Compass

34. In tangential tacheometry, the angle of elevation to the top of a tower is α while the angle of depression to its foot is β. If the horizontal distance is D, the height of the tower will be equal to [ ]
A) D tan (α + β) B) D (tan α + tan β) C) D(tan α - tan β) D) D tan (α - β)

35. The method generally preferred for contouring rough country where ordinary leveling is tedious and chaining is slow and inaccurate is [ ]
A) Levelling B) Plane table surveying
C) Tacheometric surveying D) Compass surveying

36. Horizontal distance obtained by tacheometric observations [ ]
A) Require slope correction B) Require pull correction
C) Require slope and pull corrections D) Do not require slope and pull corrections

37. If only horizontal cross-wires is/are provided in the stadia diaphragm of a tacheometry, these may be [ ]
A) One B) Two C) Three D) Four

38. The multiplying constant of a tacheometer is [ ]
A) f/i B) (f/d) + i C) (f/i) + d D) f + d

39. The stadia method in tacheometry is used to determine [ ]
A) Horizontal angles B) Vertical angles
C) Horizontal distances D) Horizontal and vertical distances

40. For a tacheometer equipped with an analytic lens, the additive and multiplying constants are, respectively [ ]
A) 0& 100 B) 100 &0 C) 0& 0 D) 100& 100

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QUESTION BANK (OBJECTIVE)

Subject with Code : Surveying(16CE105)**Course & Branch**: B.Tech - CE **Year & Sem:** II-B.Tech & I-Sem **Regulation:** R16

UNIT –IV

CURVES

1. A circular curve is most suited for connecting [ ]
   A) two straights in horizontal plane only B) two straights in vertical plane only.
   C) two straights, one in horizontal plane and the second in vertical plane.
   D) two straights in horizontal plane or vertical plane.
2. A compound curve consists of [ ]
   A) two circular arcs of same radius only. B) two circular arcs of different radii only.
   C) two circular arcs of different radii with their centers of curvature on the same side of the common tangent only.
   D) two or more circular arcs of different radii with their centers of curvature on the same side of the common tangent.
3. The long chord of a circular curve of radius R with deflection angle Δ is given by [ ]
   A) 2R cos (Δ /2). B) 2R sin (Δ /2). C) 2R tan (Δ /2). D) 2R sec (Δ /2).
4. The lengths of long chord and tangent of a circular curve are equal for the deflection angle of [ ]
   A) 30°. B) 60°. C) 90°. D) 120°.
5. The degree of a circular curve of radius 1719 m is approximately equal to [ ]
   A) 1°. B) 10°. C) 100°. D) None of the above.
6. If the chainage of point of commencement of a circular curve for a normal chord of 20 m is 2002.48 m, the length of the first sub-chord will be [ ]
   A) 2.48 m. B) 17.52 m. C) 20 m. D) 22.48 m.
7. If the chainage of point of tangency of a circular curve for a normal chord of 20 m is 2303.39 m, the length of the last sub-chord will be [ ]
   A) 3.39 m. B) 16.61 m. C) 23.39 m. D) none of the above.
8. Setting out a simple curve by the two-theodolite method does not require [ ]
   A) Angular measurements B) Linear Measurements

C) Both Angular and Linear Measurements D) None of the above

9. The angle subtended by the long chord of a simple circular curve at its centre is equal to [ ]

A) Angle of deflection B) two times the angle of deflection

C) 180° – angle of deflection D) 180° – angle of deflection / 2

10. The long chord and tangent length of a circular curve of radius R will be equal if the angle of deflection is [ ]

A) 300 B) 600 C) 1200 D) 1500

11. If the degree of a curve is 10° and if the chain length is 30m, then the radius of the curve is equal to [ ]

A) 5400m B) 1720m C) $\frac{1720}{\pi}$ m D) $\frac{3440}{\pi}$ m

12. The ratio of the radius and the apex distance of a curve of radius R deflecting through Δ is [ ]

A) Sect$\frac{\Delta}{2} - 1$ B) 1- sec$\frac{\Delta}{2}$ C) cot $\frac{\Delta}{2} - 1$ D) tan$\frac{\Delta}{2} - 1$

13. When the length of any chord of a curve is less than peg interval, it is known as a [ ]

A) small chord B) sub-chord C) normal chord D) short chord

14. Designation of a curve is done by the [ ]

A) Angle subtended by a chord of any length

B) Angle subtended by an arc of specified length

C) Radius of the curve D) Curvature of the curve

15. The angle of intersection of a curve is the angle between the [ ]

A) Back tangent and forward tangent B) Prolongation of a back tangent and forward tangent

C) Forward tangent and long chord D) Back tangent and long chord

16. The approximate formula for radius as well as perpendicular offset according to the tangent method of laying simple circular curves is [ ]

A) $\frac{x}{2R}$ B) $\frac{x^2}{2R}$ C)$\frac{x}{R}$ D) $\frac{x^2}{R}$

17. If D is the degree of a curve of radius R, then the tangential angle may be obtained by Rankine's method, in minutes, by multiplying the length of the chord by the [ ]

A) Degree of curve B) Square of the degree of curve

C) Inverse of the degree of curve D) Radius of curve

18. The radius of simple circular curve is 30m and the length of the specified chord is 30m. The degree of the curve is [ ]

A) 57.29 B) 3.70 C) 55.60 D) 37.03

19. If the angle of intersection of a curve is θ, then the deflection angle will be [ ]

A) θ/2 B) 180°– θ C) 180° + θ D) 90° + θ

20. If S is the length of a sub-chord and R is the radius of a simple curve, the angle of deflection between its tangent and sub-chord, in minutes, is equal to [ ]

A) $573\frac{S}{R}$ B) $1718.9\frac{S}{R}$ C) $1718.9\frac{R}{S}$ D) $573\frac{R}{S}$

21. For a curve of radius 100m and normal chord 10m, the deflection angle given by Rankine's formula is [ ]

A) 1045.95 B) 2051.53 C) 0035.95 (D) 171.89

22. If Δ is the angle of deflection of the curve and T_1 and T_2 are its points of tangencies, the angle between the tangent at T_1 and long chord T_1T_2 will be [ ]

A) Δ/4 B) Δ/3 C) Δ/2 D) Δ

23. For setting out a simple curve using two theodolites, [ ]

A) offsets from tangents are required B) offsets from chords produced and required

C) deflection angles from Rankine's formula are required

D) none of the above are required

24. In India, curves are designated by [ ]

A) Degree of curve B) Radius of curve C) Length of curve D) all of the above

25. If the radius of a simple circular curve is 400m and deflection angle is 1200 the mid-ordinate is [ ]

A) 100m B) 200m C) 400m D) 800m

26. The best method for laying a curve is by [ ]

A) Tacheometer B) two theodolites

C) deflection distances D) offsets from the tangents produced

27. If the length of chord is 30m, radius of curve in metres is [ ]

A) 443 B) 434 C) 344 D) 172

28. The degree of a curve is70, its radius is [ ]

A) 136.7 m B) 163.7 m C) 137.6 m D) 173.6 m

29. Tangent length is the distance from [ ]

A) apex of the curve to the tangent point B) apex of the curve to the centre of the curve

C) point of intersection to the tangent point D) point of the curve to the point of tangency

30. The distance from the apex to the midpoint of long chord is known as [ ]

A) apex distance B) tangent distance C) long chord D) versed sine of the curve

31. Versed sine of the curve of radius R and deflection angle θ is [ ]

A) R (1 – sin θ) B) R (1 – cos θ) C) R (1 – sin 2θ) D) $R\left(1 - \cos\frac{\theta}{2}\right)$

32. If θ is the deflection angle in a simple curve of radius R, tangent distance is [ ]

A) R sin θ B) R tan θ C) $R \tan\frac{\theta}{2}$ D) $2R \tan\frac{\theta}{2}$

33. In a simple curve, if the angle of intersection is 70° the angle the curve makes at the centre of the circle is [ ]
A) 70° B) 180° C) 110° D) 290°

34. A Reverse curve consists of [ ]
A) two circular arcs of same radius only. B) two circular arcs of different radii only.
C) two circular arcs of different radii with their centers of curvature on the same side of the common tangent only.
D) two or more circular arcs of different radii with their centers of curvature on the same side of the common tangent.

35. The length of a long chord of a simple curve of radius 10 m and deflection angle 60° is[ ]
A) 160 m B) 10 m C) 20 m D) 10 √ 3m

36. In a simple curve of radius R, if θ is the deflection angle, the length of the long chord is [ ]
A) R sin θ B) 2 R sin θ C) 2 R sin $\frac{\theta}{2}$ D) R sin $\frac{\theta}{2}$

37. In a compound curve if ∝ and β be the angles made by the rear tangent and forward tangent and forward tangent with common tangent then the angle of intersection is [ ]
A) I = 180° – 2∝ B) I = ∝ + β C) I = 180° – 2 β D) I = 180° –(∝+ β)

38. In a simple curve of radius R, perpendicular offset from a long chord is given by [ ]
A) $\sqrt{R^2 - X^2}$+ R-00 B) $\sqrt{R^2 - X^2}$– (R+00)
C) $\sqrt{R^2 - X^2}$– (R-00) D) $\sqrt{R^2 + X^2}$– (R-00)

39. The external distance of a simple curve of radius R and defection angle θ is given by the expression [ ]
A) R tan θ/2 B) 2 R sin θ/2 C) R versine$\frac{\theta}{2}$ D) R (sin $\frac{\theta}{2}$ - 1)

40. The length of a simple curve of radius 200 m having a deflection angle 45º is equal to [ ]
A) 157.08 m B) 200 m C) 45 m D) 314.16 m

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UNIT –V

ELECTRONIC DISTANCE MEASUREMENTS

1. The specification for distance measurement with a total station is given as ± (3mm+2ppm). The accuracy of measurement of 100m is [ ]
A) ± 3.2mm B) ± 5mm C) ± 0.203 D) ± 0.05mm

2. Identify the incorrect statement
A) Most total stations are designed so that zenith angles are displayed rather than vertical angles
B) EDM part of a total station uses phase difference technique for measurements [ ]
C) a tilt sensor monitors both components of the vertical axis tilt
D) total station can provide hard copies of field notes

3. The least count of angular measurement of total station generally in the order of [ ]
A) 30” B) 20” C) 10” D) 1”

4. Identify the incorrect statement [ ]
A) Perfect levelling may be made using optical plummet
B) Human errors in recording observations in total station are eliminated
C) The accuracy in the EDM part of total station ranges of the order of 2mm + 2 ppm
D) Data from total station can be directly transferred to computers for plotting contours.

5. The point on the celestial sphere vertically below the observer's position, is called [ ]
A) zenith B) celestial point C) nadir D) pole

6. The parallax equation $\Delta p = \frac{Bm\Delta h}{H - h}$ is applicable to entire overlap of the photographs only if Paralla is measured [ ]
A) normal to base line B) parallel to base line C) both (a) and (b) D) None of the above

7.The stereo plotting instruments are generally manufactured on the principle of [ ]
A) optical projection B) optical mechanism projection
C) mechanical projection D) all the above.

8.Latitude of a place is the angular distance from [ ]
A) Greenwich to the place B) equator to the poles
C) equator to the nearer pole D) equator to the nearer pole along the meridian of the place

9.International date line is located along [ ]
A) standard meridian B) Greenwich meridian C) equator D) 180° longitude

10.The shortest distance between two places measured along the surface of the earth, is [ ]
A) length of the equator between their longitudes
B) length of the parallel between their longitudes

C) length of the arc of the great circle passing through them
D). none of these.

11. The correction for parallax, is [ ]
A)- 8".8 cos α B) + .8" sin α C) + 8".8 cos α D)- 8".8 cos α.

12. The angle between the plane of the equator and the plane of the ecliptic, is known as obliquity of the ecliptic and its value is [ ]
A) 22° 30' B) 23° 27' C) 23° 30' D) 24° 0'.

13. Systematic errors [ ]
A) always follow some definite mathematical law
B) can be removed by applying corrections to the observed values
C) either make the result too great or too small D). are also known as cumulative errors

14. Perspective centre relates to [ ]
A) parallel projection B) orthogonal projection C) central projection D) none of these.

15.Pick up the correct statement from the following: [ ]
A) Sidereal time at any instant is equal to the hour angle of the first point of Aries
B) Local sidereal time of any place is equal to the right ascension of its meridian
C) Sidereal time is equal to the right ascension of a star at its upper transit
D) All the above.

16. Polaris is usually observed for the determination of the azimuth when it is [ ]
A) at culmination B) at elongation
C) neither at culmination nor at elongation D) either at culmination or at elongation.

17. The latitude (λ) of a place and the altitude (α) of the pole are related by [ ]
A) $\lambda = \alpha$ B) $\lambda = 90° - \alpha$ C) $\lambda = \alpha - 90°$ D) $\lambda = 180° - \alpha$.

18.The station which is selected close to the main triangulation station, to avoid intervening obstruction, is not known as [ ]
A) satellite station B) eccentric station C) false station D) pivot station

19. The length traversed in one cycle by the wave is termed as [ ]
A) Wave length B) Time C) Velocity D) Frequency

20. Time taken to complete one cycle is called [ ]
A) Frequency B) Velocity C) Period D) None of the above

21. Which of the following is electromagnetic distance measurement? [ ]
A) DDM B) ODM C) Geodimeter D) None of the above

22. The velocity of light is _____ [ ]
A) 3×10^8m/s B) 3×10^5m/s C) 3×10^7m/s D) 3×10^8km/s

23. The range of frequency used in tellurometer is [ ]
A) 3 to 30 GHZ B) 3 to 30 MHZ C) 3 to 30 KHZ D) none of the above

24. The tellurometer is used to measure the distance up to _____ [ ]
A) 100m B) 100km C) 100cm D) 100mm

25. A geodimeter is one of the _____ EDM instrument [ ]
A) Microwave B) Visible light C) Infrared D) None of the these

26. The maximum ranges for measuring the distance by microwave instrument is [ ]
A) 30-80km B) 80-100km C) 100-150km D) 200km

27. Frequency modulation technique is employed in _____ instrument [ ]

A) Microwave B) Visible light C) Infrared D) None of these

28. Amplitude modulation technique is employed in _____ instrument [ ]

A) Microwave B) Visible light C) Infrared D) None of these

29. A telescope that uses a mirror to collect light is called a [ ]

A) Refractor B) Reflector C) Interferometer D) spectrometer

30. The electromagnetic energy sensors that are currently being operated from. [ ]

A) Water borne B) air borne C) both a &b D) none

31. Electromagnetic radiation extends from _____to_____ [ ]

A) Electromagnetic B) radioactive C) radio waves D) none

32. Electromagnetic spectrum includes _____rays [ ]

A) Ultraviolet rays B) seismic rays C) visible light D) all the above

33. Measurement of electromagnetic spectrum is known as_____ [ ]

A) Spectral bands B) brain wave C) only b D) both a & b

34. Distance b/w successive wave crests is known as_____. [ ]

A) Wavelength B) wave energy C) wave velocity D) wind speed

35. How many types of EDM instruments are there based on wavelength? [ ]

A) 2 B) 4 C) 5 D) 3

36. Wavelength with in which electromagnetic radiation is absorbed by the atmosphere is known as _____. [ ]

A) Absorption band B) adsorption band C) reactive band D) all the above

37. Which of the below is used up to a range of 100km? [ ]

A) Infrared B) Microwave C) Visible range D) Ultra-violet

38. Which unit in total station processes data collected? [ ]

A) Data collector B) EDM C) Storage system D) Microprocessor

39. Which is the latest development in total station? [ ]

A) High resolution B) High accuracy C) Robotic D) Automatic

40. Each point entered in a total station is stored in: [ ]

A) Hard discs B) Electronic books C) Data storage D) Chip

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