Question Paper

Exam Date & Time: 22-Nov-2019 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENES
END SEMESTER THEORY EXAMINATIONS- NOV 2019
III SEMESTER B.Sc.(Applied Sciences) IN ENGINEERING
SURVEYING [ICE 234]

Marks: 100 **Duration: 180 mins.**

Answer 5 out of 8 questions.

1) Explain the objectives, classification and principles of surveying. (10)

A)

B) 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 a level book and calculate the R.L. of points if the first reading was taken with a staff held on a bench mark of 432.384 m. (10)

2) Define sensitiveness of bubble tube? Derive and Explain field procedure for finding sensitiveness of bubble tube. (10)

A)

B) (i) The reading taken on a staff 100 m from the instrument with the bubble central was 1.872m. The bubble is then moved 5 divisions out of the center, and the staff reading is observed to be 1.906 m. Find the angular value of one division of the bubble, and the radius of curvature of the bubble tube. The length of one division of the bubble is 2 mm. (10)

(ii)The staff readings taken during a levelling operation are given below: 1.355, 1.605, 2.125, 0.685, 1.365, 2.015, 1.355, -1.385, 0.685, 2.105, 1.685, 1.155, 1.105, 2.015, 1.085, 1.345, 1.355, -2.015, 1.305, 1.655, 1.685, 1.455. The instrument was shifted after 5th, 10th, 14th, and 19th readings. Arrange the data and find the RLs of the points if the reading was taken to a BM of RL 185.205m. (Note: -ve sign for readings indicate the staff is inverted). Adopt Height of collimation method.
(4+6=10m)

3) Draw a schematic diagram of theodolite and explain the terminologies. (10)

A)

B) To find the elevation of the top (Q) of a hill, a flag- staff of 2m height was erected and observations were made from two stations P and R, 60m apart. The horizontal angle measured at P between R and the top of the flag-staff was 60^0 30' and that measured at R between the top of the flag-staff and P (10)

was 68^0 18'. The angle of elevation to the top of the flag-staff was measured to be 10^0 12' at P. The angle of elevation to the top of the flag-staff was measured to 10^0 48' at R. Staff readings on B.M when the instrument was at P= 1.965m and that with the instrument at R = 2.055m. Calculate the elevation of the top of the hill if that of B.M was 435.065m.

4) Briefly explain about electronic theodolite. (10)

A)

B) Explain different systems of Tacheometric measurements. (10)

5) A tachometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff. The instrument is fitted with an anallactic lens and the constant is 100. Compare the length of PQ and reduced level of Q, that of P being 350 meters. (10)

A)

Staff station	Vertical angle	Staff intercept	Axial hair reading
P	$9^0 6'$	2.50m	2.15m
Q	$6^0 6'$	2.10m	1.95m

B) i) Explain with neat sketch Centre line method for Building structures. (10)
ii)Explain with neat sketch the characteristics of contour surveying.
(5+5=10m)

6) Explain brief procedure for setting out the curve by successive bisection of arcs. (10)

A)

B) Two tangents intersect at chainage 58+30, the deflection angle being 45^0.Calculate the necessary data for setting out curve of 10 chains radius to connect the two tangents if it is intended to set out the curve by offsets from chords. Take peg interval as 5 meters. The length of the chain is 30meters (10)

7) Explain with neat sketch about setting out Compound curve (10)

A)

B) i) By the help of a figure explain various parts of the reverse curve.Also write an expression for common tangent and line joining the tangent points. (10)
ii) A reverse curve is to join two straights having a very acute angle of intersection.The common tangent (150 m) makes an angle of intersection of 130^0 and 140^0 with the main straights.Calculate the suitable common radius.
(5+5=10m)

8) Explain the basic concept and principles of Elecronic distance measurement. (10)

A)

B) Explain the applications of underground survey. (10)

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