

UNIVERSITY OF RUHUNA

Continuous Evaluation Test

B.Sc. Fisheries and Marine Science Degree programme: Level III- 2017

Module: **LIM 3231** (Surveying & Leveling)

Time: 30 minutes

MCQ Type

Index No:

Answer all questions.

Please ensure that you have written your index number in the space provided above.

Each question has 5 answers, indexed under (a), (b), (c), (d) and (e).

Mark the correct answer by placing "✓".

Only one answer should be marked in each question. If more than one answer is marked for a question, that question will not be evaluated.

Mobile phones and smart watches are prohibited.

1. Select the **correct** answer based on the given statements.
 - A. Leveling is the process of determining relative elevations of places with respect to a datum line.
 - B. Leveling is used for the preparation of contour lines.
 - C. Area of a land cannot be determined by leveling.
 - (a) All statements are correct.
 - (b) Statements A and B are correct.
 - (c) Statements B and C are correct.
 - (d) Only statement C is correct.
 - (e) Only statement A is correct.

2. The instruments which can be used to take the horizontal line of sight are;
 - (a) Auto level and staff gauge.
 - (b) Theodolite and staff gauge.
 - (c) Spirit level and base plate.
 - (d) Auto level and spirit level.
 - (e) Auto level and base plate.

3. Staff bubble is used to keep;
 - (a) the tripod in vertical position.
 - (b) the base plate in horizontal position.
 - (c) the line of sight towards north direction.
 - (d) auto level in horizontal position.
 - (e) Staff gauge vertically.

4. Select the **incorrect** statement from followings.
- (a) A surface or a line to which observed heights are related, are named as the bench mark.
 - (b) Height of collimation is the height of the line of the collimation below the datum.
 - (c) Bench Mark is a fixed point of known height above the selected line of sight.
 - (d) Reduced Level is height of a point or object stated with reference to the selected contour line.
 - (e) Truly horizontal line of sight which passes through the optical center of the telescope of the leveling instrument is line of sight.
5. In a leveling measurement, backsight is 2.50 m at the bench mark (308.55 m) and the foresight is 4.85 m. What would be the reduced level at the foresight?
- (a) 313.40 m
 - (b) 311.05 m
 - (c) 306.20 m
 - (d) 315.90 m
 - (e) 306.05 m
6. Select the correct statement from followings.
- (a) Staff gauge is used to measure horizontal heights.
 - (b) Staff bubble is used to keep the staff gauge in soft grounds.
 - (c) Level surface is represented by the water surface in a reservoir.
 - (d) Base plate is used to avoid penetrate the shoes of tripod into soft grounds.
 - (e) Horizontal surface is represented by the water surface in a reservoir.
7. Fly leveling is a leveling method which;
- (a) is used to determine height difference in two points.
 - (b) determinesthe undulations of the ground surface along the profile line.
 - (c) uses only one instrument position to take readings.
 - (d) is performed to connect bench mark to starting point of any leveling alignment.
 - (e) takes readings above the line of collimation.
8. Inverseleveling is a leveling method which;
- (a) is performed to connect bench mark to starting point of any leveling alignment.
 - (b) is used to determine height difference in two points.
 - (c) determinesthe undulations of the ground surface along the profile line.
 - (d) takes readings above the line of collimation.
 - (e) uses only one instrument position to take readings.
9. Select the **correct** statement.
- (a) The difference of height between two points at a considerable distance apart (across a river) can accurately be determined by using inverse-leveling.
 - (b) The difference of height between two points at a considerable distance apart (across a river) can accurately be determined by using reciprocal leveling.
 - (c) All errors due to curvature of earth, refraction by atmosphere and collimation error by faulty adjustments can be eliminated using inverse leveling.
 - (d) Only errors due to curvature of earth can be removed by reciprocal leveling.
 - (e) Collimation error can be eliminated by fly leveling.

10. Select the **correct** answer based on given statements with respect to the contours.
- A. Contour line a line passing through points of equal reduced levels.
 - B. The distance between contours indicates the steepness of a slope. Wide separation denotes gentle slopes; close spacing, steep slopes; even and parallel spacing, uniform slope.
 - C. Contours of different elevations never meet except on a vertical surface such as a wall, cliff, or natural bridge. They cross only in the rare case of a cave or overhanging shelf.
- (a) All statements are correct.
 - (b) Statements A and C are correct.
 - (c) Statements B and C are correct.
 - (d) Only statement C is correct.
 - (e) Only statement A is correct.
11. Collimation error;
- (a) Occurs when telescope of the leveling instruments is in horizontal position.
 - (b) Can be removed by keeping the equal horizontal distances of the backsight and foresight.
 - (c) Cannot be determined by the Horizontal Collimation Test.
 - (d) Cannot be determined and removed.
 - (e) will not be proportional to the difference in distance from the instrumental positions to the backsight and foresight.
12. Select the **correct** statement/s with regard to contouring using grid method.
- A. Several leveling instrument positions can be used based on the topography and the extent of the land.
 - B. Reduced levels in grid intersection points can be calculated based on rise and fall method or height of collimation method.
 - C. Grid size should be selected based on the topography of the field.
- (a) All statements are correct
 - (b) Only statement C is correct
 - (c) Statements A and B are correct
 - (d) Statements B and C are correct
 - (e) Only statement B is correct
13. Cross-Hair Parallax Error;
- (a) Is an instrumental error.
 - (b) Is a natural error.
 - (c) Is a personal error.
 - (d) Cannot be removed by the proper focusing the instrument.
 - (e) Occurs due to wearing and tearing of the bolts and nut in the tripod.

14. Actual misclosure determined after a leveling activity is 0.008 m. If the numbers of instrument positions are four, what would be the permissible misclosure?
- (a) 0.010m
 - (b) 0.016m
 - (c) 0.024m
 - (d) 0.005m
 - (e) 0.048m
15. Accuracy of leveling activity can be determined by;
- (a) leveling back to the second intermediate sight of first instrument position.
 - (b) following inverse leveling process.
 - (c) leveling to a bench mark.
 - (d) following reciprocal leveling process.
 - (e) using arithmetic check.
16. Select the **FALSE** statement of followings on the setting of the plane table.
- (a) The table should be leveled.
 - (b) The table should be exactly centered over the measured field in radiation method.
 - (c) The tripod should be adjusted to convenient height for the surveyor.
 - (d) The table should be oriented.
 - (e) The tripod which is used to set up the plane table should be firm with good spread of the legs.
17. The instrument which is not used in plain table survey is;
- (a) Plumbob and Compass
 - (b) Chain and compass
 - (c) Raging poles and arrows (negs)
 - (d) Tripod and Alidade
 - (e) Tape and filed book
18. A 20 m chain is divided into;
- (a) 50 links
 - (b) 100 links
 - (c) 150 links
 - (d) 175 links
 - (e) 200 links
19. For ranging a line, the number of ranging rods required at least are;
- (a) two
 - (b) three
 - (c) four
 - (d) five
 - (e) six
20. If 250 m length has been represented by a drawn line of 25 mm, the scale of the drawing is;
- (a) 1:1000000
 - (b) 1:100000
 - (c) 1:10000
 - (d) 1:1000
 - (e) 1:100

21. The curvature of the earth's surface is taken into account only if the extent of survey would be more than;
- (a) 60 sq. kilometers
 - (b) 160 sq. kilometers
 - (c) 260 sq. kilometers
 - (d) 500 sq. kilometers
 - (e) 750 sq. kilometers
22. Alidade is used in;
- (a) Tachometry
 - (b) Plane Tabling
 - (c) Chaining
 - (d) Compass Surveying
 - (e) Ranging
23. Find the **correct** answer on plane table surveying.
- A. Radiation method can be used for any shapes of lands.
 - B. The accuracy of the plotted points can readily be verified in the field by check observations.
 - C. Necessary to maintain field notes.
- (a) Only (B) is correct.
 - (b) Only (A) is correct.
 - (c) Only (A) and (B) are correct.
 - (d) Only (A) and (C) are correct.
 - (e) All statements are incorrect.
24. In chain surveying, field work is limited to;
- (a) Angular measurement only.
 - (b) Linear measurement only.
 - (c) Both angular and linear measurements.
 - (d) Vertical measurement only.
 - (e) All angular, vertical and linear measurements.
25. In chain survey, the area is divided into:
- (a) Circle
 - (b) Square
 - (c) Triangles
 - (d) Rectangles
 - (e) Polygons

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LIM 3231 (Surveying and Leveling)

Time: 1 hour

PART A – Structured - Answer All Questions

1. Sketch of a leveling procedure conducted in a field are shown in the Figure 01. The leveling has been started from a bench mark (RL=150m) and ended at point "J".

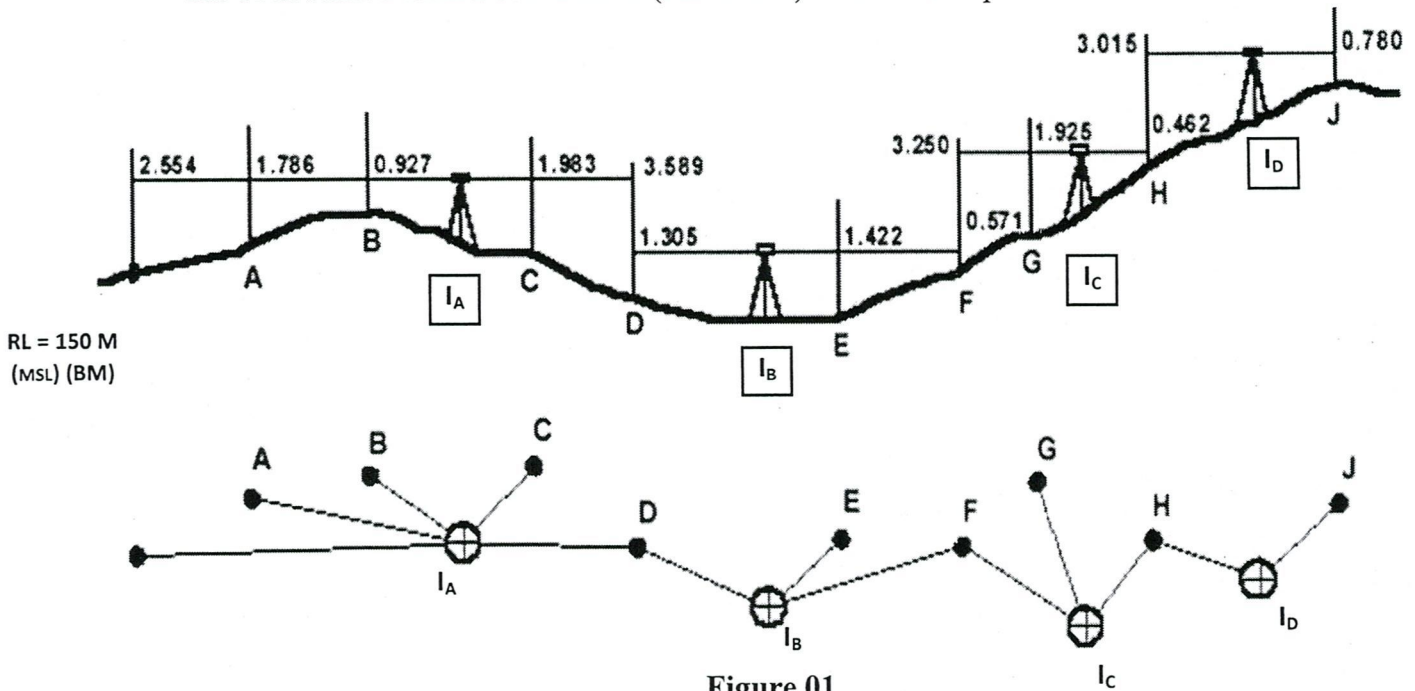


Figure 01

02.(a) (i) With the aid of the suitable diagram, explain the basic operating principle of the optical square.

(20 marks)

(ii) List the different methods of setting out right angles (offsets) to a chain line.

(20 marks)

(b) The figure 2 shows the recorded data of a field book page of a chain surveying. (distances of each point of the chain lines and lengths of offsets are given in meters).

(i) List the steps to be followed to complete the given chain survey.

(20 marks)

(ii) Draw a land surveying map with suitable scale of the given figure 2. (Graph papers are provided).

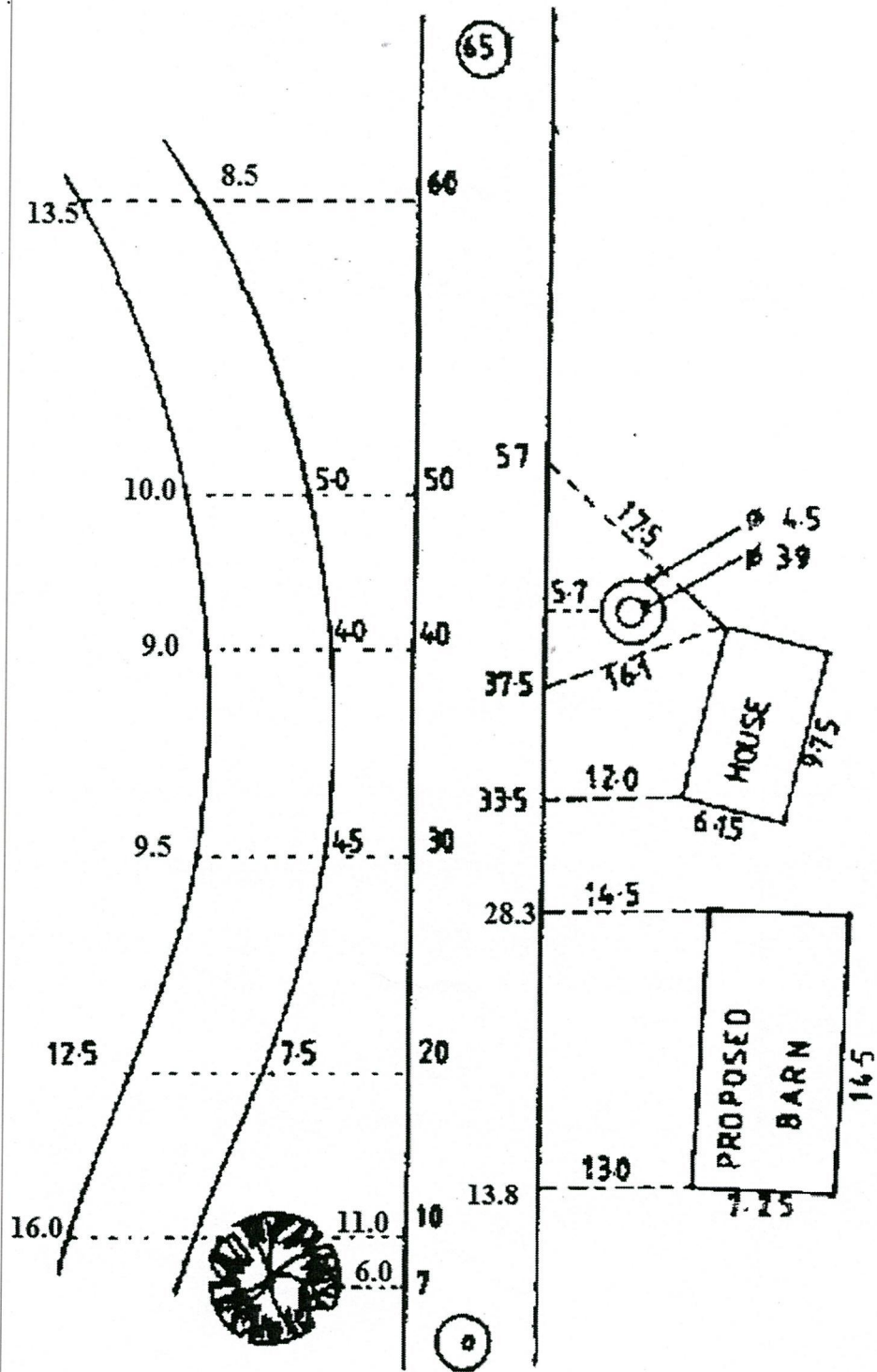


Figure 2

(40 marks)

PART B – Essay - Answer All Questions

1. (a). What is contouring? Why is it important in aquaculture? (10 Marks)
- (b).How profile leveling use in aquaculture? (20 Marks)
- (c). Explainone method of contouring (listed above) clearly using suitable diagrams. (25 Marks)
- (d). One of error evaluation methods in leveling is closing loop method. Briefly explain it. (25 Marks)
- (e). What are the steps you would follow to reduce errors occurs when using the auto level in the field? (20 Marks)
2. (a) Classify the survey methods according to the mode of working. Elaborate your answer with suitable sketches. (15 marks)
- (b) List the procedure to be followed to estimate the area of a fish pond. (20 marks)
- (c) Discuss the advantages and disadvantages of different surveying methods. (20 marks)
- (d) How can you avoid different types of obstacles met during the land surveying? (20 marks)
- (e) Suppose that you have been assigned to map a boundary of a 5 ha water body using only the compass and measuring tape. Explain how do you fulfill this target under the given circumstances? (25 marks)

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