

B.Sc.(Ag.) Honours Semester– III Examination, 2014

Course No. : AEG –211 (Land Surveying & Irrigation Engineering)

(Old Syllabus)

Signature of Centre Superintendent

Roll No.: (in figure) _____ (in words) _____
Student Index No. _____ Regn. No. _____ of _____

Time : Two hours

Full marks : 50

Questions are of value as indicated in the margin

Part-I

(Objective and Short Answer Type)

(Use only ball point pen)

Time : 30 minutes

Full marks : 20

- Note:** 1. Answer in question paper itself.
2. Striking, rewriting and overwriting are not allowed in the objective type questions.

1. Write True (T) or False (F) in the space provided for following statements (any four):

1×4=4

- i) The fundamental principle of surveying is to work from part to whole. ☐
- ii) The last staff reading in any set up of the leveling instrument is called intermediate sight. ☐
- iii) For a constant discharge rate, water horse power increases with decrease in total head. ☐
- iv) Four rings are there between two links in a metric chain. ☐
- v) The motor of a submersible pump lies on the ground level. ☐
- vi) Closely spaced contour lines in a map indicate a steep ground. ☐

2. Fill in the blanks of the following (any four):

1×4=4

- i) The reduced level of datum line is _____
- ii) Contour lines cross a ridge or valley line at _____
- iii) The most efficient and economical open channel is _____ in cross section
- iv) Gate stand is a part of _____ irrigation system
- v) The length of each link in a 30 m metric chain is _____
- vi) When siphon crosses a road, bund or ridge, it is called a _____

3. Tick (✓) the correct answer (any four):

1×4=4

- i) The power of a 5 hp pump is equal to (a) 5 kW (b) 37 kW (c) 3.73 kW (d) 5.73 kW
- ii) In a cipoletti weir, the side slope is (a) V:H::1:4 (b) H:V::1:4 (c) H:V::2:1 (d) V:H::2:1
- iii) Select the component that does not belong to underground pipeline irrigation system
(a) gate stand (b) pump stand (c) hydrant (d) turn out
- iv) The principle of chain survey is based on
(a) traversing (b) triangulation (c) square grid (d) all
- v) What would be the back bearing of line AB if fore bearing is 60°
(a) 60° (b) 120° (c) 180° (d) 240°
- vi) Which of the following is not a method of Plane table surveying
(a) intersection (b) radiation (c) included angle (d) traversing

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Part–II
(Descriptive Type)

Time : 1.5 Hours

Full marks : 30

Questions are of value as indicated in the margin.

Answer *any three* questions .

5. (a) A 30 m metric chain was used to measure distance between two stations. The distance was plotted to a scale of 1:100 and measures 870 m in the plan. Later on it was found that the chain has an error of 150 cm too short. Calculate the true distance. 5
- (b) What are the characteristics of contour lines? Discuss about various types of levelling. 5
6. (a) How does a submersible pump differ from a vertical turbine pump? Explain the working principle of the submersible pump. 5
- (b) Calculate the size of the electric motor directly coupled with a centrifugal pump under following conditions. Static suction head = 4 m; static delivery head = 8 m; efficiency of the pump = 60%; efficiency of the motor = 95%; and amount of water to be pumped in 12 hours = 90 ha.cm. Ignore head loss due to friction. 5
7. (a) Discuss about the underground pipeline system for irrigation. 5
- (b) Design an economical section of a trapezoidal channel to carry a discharge of 8.4 m³/s. The bed slope is 1:4000 and the side slope is 2:1 and Manning's roughness coefficient is 0.015. 5
8. With the help of a schematic diagram, explain the deep tube well drilling by direct rotary method. How is the reverse rotary method different from the direct rotary method and under what situation it is preferred? 10
9. (a) With the help of neat diagram explain the reciprocating pump. 5
- (b) Describe the working principles of centrifugal pump with neat diagram. 5
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