

B.Sc. (Ag.) Honours Semester-II Examination, 2017
Course No: AEG-121 (Fundamental of Soil and Water
Conservation Engineering)

Signature of Centre Superintendent

Roll No. : (in figure) _____ (in words) _____

Student Index No. _____ Regn. No. _____ of _____

Time : Two Hours

Full marks : 40

Questions are of value as indicated in the margin

Part - I
(Objective and Short Answer Type)
(Use only ball point pen)

Time : 20 minutes

Full marks : 10

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

1. State True (T) or False (F) in respect the following statements :

0.5×5=2.5

- (i) V-notch weir should have only 90° notch.
- (ii) Trough compass is associated with compass survey.
- (iii) The practical suction limit of centrifugal pump is less than 10m.
- (iv) Cross staff is a surveying instrument used for ranging.
- (v) The capacity of the pump varies directly with the speed.

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2. Fill up the blanks with most appropriate words.

0.5×10=5

- (i) The length of metric chain is _____
- (ii) The length of each link in engineer's chain is _____
- (iii) Operating pressure of drip irrigation is _____
- (iv) The impeller built in the centrifugal pump for irrigation is _____
- (v) _____ is an instrument for setting right angles.
- (vi) If 126° 15' is whole circle bearing, then the quadrantal bearing is _____.
- (vii) Back bearing of a line AB is N26° 14'E. The fore bearing of the line is _____
- (viii) The angle between AB and AC if the respective bearings are 30°15' and 78°30' _____
- (ix) 1 ha⁻ cm = _____ litre
- (x) The discharge through 90° v-notch is _____ if the head over the notch is 30cm.

P.T.O.

(2)

3. Tick (✓) the correct alternatives :

0.5×5=2.5

- (i) The angle between the lines AB and AC if their respective bearings are $N75^{\circ}15'E$ and $S 30^{\circ}15'W$ - (a) $130^{\circ}15'$ (b) $135^{\circ}45'$ (c) $135^{\circ}0'$ (d) $136^{\circ}45'$.
- (ii) The length of each link in a metric chain is (a) 0.2m (ii) 1m (iii) 0.5m (iv) 2m
- (iii) What type of centrifugal pump is used as submersible pump
(a) Volute (b) Diffuser (c) Jet (d) Turbine
- (iv) A cipoletti weir has a breadth of 60cm at its crest. The head of water flowing over the crest is 30cm. The discharge over the weir is
(a) 183 l/s, (b) 205 l/s (iii) 155 l/s (iv) 172 l/s
- (v) The magnetic bearing of a line AB is $134^{\circ}45'$. The true bearing of the line is $124^{\circ}30'$.
The magnetic declination is (a) $10^{\circ}20'w$ (b) $12^{\circ}15'E$ (iii) $10^{\circ}15'w$ (iv) $10^{\circ}30'w$.

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Part - II
(Descriptive Type)

Time : 100 Minutes

Full marks : 30

Questions are of value as indicated in the margin

Answer *any four* questions from the following out of which

4. The following fore and back bearings were observed in traversing with a compass. 7.5
- | Line | Fore bearing | Back bearing | Distance (m) |
|------|-------------------|-------------------|--------------|
| AB | $60^{\circ} 30'$ | $240^{\circ} 30'$ | 20 |
| BC | $99^{\circ} 15'$ | $278^{\circ} 0'$ | 25 |
| CD | $38^{\circ} 45'$ | $221^{\circ} 30'$ | 18 |
| DE | $321^{\circ} 15'$ | $139^{\circ} 45'$ | 26 |
- Determine the included angle and area.
5. (a) What is bench mark? What are the different types of bench mark? Discuss briefly about them. 3.5
- (b) Discuss with the help of neat diagram working of different underground pipe line structures. 4
6. The following consecutive readings were taken with a dumpy level : 3.864, 3.346, 2.932, 1.952, 0.854, 3.796, 2.639, 1.542, 1.934, 0.864, 0.665. The level was shifted after the 5th and 8th readings. The first reading was taken on the benchmark of R.L. 150.250. Calculate the reduced levels of the change points and the difference of level between the first and last point. 7.5
7. (a) A centrifugal pump delivers water at the rate of 90 l/s against a total head of 50m. Determine the water horse power and break horse power if the efficiency is 75%. 2.5
- (b) Describe working principle and construction of volute and diffuser type centrifugal pumps. 5
8. (a) Explain the working of Parshall flume for measurement of irrigation water with the help of a neat sketch. 2.5
- (b) Describe drip irrigation layout and different components used in drip irrigation system. 5
9. Design a most economic trapezoidal channel to carry $10\text{m}^3/\text{sec}$. Assume side slope of the channel is 1.5 : 1, bed slope is 3.5% and manning's roughness coefficient is 0.025. 7.5
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