



## MPPSC (AE) 2017 Test Series

# Test 03

Test ID: 875

Date: 13/06/2017

Time: 60 Minutes

Total Marks: 120

### Topics:

***Hydrology, Irrigation & TOS***

## Instructions for Candidates

1. Do not open the Question Booklet until you are asked to do so by the invigilator.
2. This Question Booklet contains **05** pages. After you are permitted to open the booklet, please check all pages and report discrepancies, if any, to the invigilator.
3. There are a total of 40 **questions** carrying **120 marks**. All these questions are of objective type. Each Question has only **one** correct answer. Questions must be answered on the Back side of the **OMR** by darkening the appropriate bubble (marked A, B, C, D) using **ONLY a black/blue ink ball point pen** against the question number. **For each question darken the bubble of the correct answer**. More than one answer bubbled against a question will be treated as an incorrect response.
4. Since bubbles darkened by the black/blue ink ball point pen **cannot** be erased, candidates should darken the bubbles in the OMR very carefully.
5. Questions 01 – 40 belong to **Hydrology, Irrigation & TOS** and carrying **03marks** each.
6. Unattempted questions will result in zero mark and also **there is no negative marking** for wrong answers.
7. Calculator, charts, graph sheets or tables are **NOT** allowed in the examination hall.
8. Rough work can be done on the question paper itself. Rough Work on Answer sheet is strictly prohibited otherwise answer sheet will be rejected.
9. **Use of mobile is strictly prohibited during exam.**
10. Before the start of the examination, write your name and registration number in the space provided below using a black ink ball point pen.

Name of Student

Batch (B1/B3)

Registration Number

**Q.1. The best technique of water distribution in the field that can be used for all types of soils and for widely different topographies and slopes is**

- (a) free flooding
- (b) border flooding
- (c) sprinkler irrigation method
- (d) furrow irrigation method

**Q.2. Sprinkler system is**

- (a) permanent system
- (b) semi-permanent system
- (c) portable system
- (d) any one of the above

**Q.3. In drip irrigation, laterals are usually \_\_\_\_\_ dia and \_\_\_\_\_ long.**

- (a) 25 to 30 mm and 50 m
- (b) 25 to 30 mm and 100 m
- (c) 10 to 12.5 mm and 20 m
- (d) 10 to 12.5 mm and 50 m

**Q.4. If wheat requires about 75 mm of water after every 28 days, and the base period for wheat is 140 days, the value of delta for wheat is**

- (a) 2 (c) 52.3 mm
- (d) none of the above
- 100 mm
- (b) 375 mm

**Q.5. The relation between critical velocity  $V_o$  and depth of flowing water  $y$  given by Kennedy is**

- (a)  $V_o = 0.55 m y^{0.64}$
- (b)  $0.64 m y^{0.55}$
- (c)  $V_o = 0.7 m y^{0.55}$
- (d)  $V_o = 0.55 y m^{0.7}$

**Q.6. According to Lacey**

- (a) natural silt transporting channels have a tendency to assume a semi-elliptic section
- (b) finer the silt, channel closely approximates a semi-circle.
- (c) silt is kept in suspension due to the force of vertical eddies
- (d) all of these

**Q.7. Lacey gave a relation between**

- (a) area and velocity
- (b) velocity and hydraulic mean
- (c) both (a) and (b)
- (d) none of these

**Q.8. A typical and most desirable section of a canal is**

- (a) in cutting
- (b) in filling
- (c) partly in cutting and partly in filling
- (d) none of the above

**Q.9. By adopting lining canals in new projects**

- (a) earthwork can be reduced
- (b) number of canal structures can be reduced (c) storage and diversion capacity may be reduced
- (d) all the above

**Q.10. Which one of the following is wrong about cement concrete tile lining of canals?**

- (a) Rigid quality control is required.
- (b) Expansion joints are not required.
- (c) Rounded sections can be easily laid.
- (d) Damaged portion can be repaired easily.

**Q.11. A land is said to be waterlogged when**

- (a) it is submerged in flood
- (b) the air circulation is stopped in the root zone due to rise in water table
- (c) the soil pores within a depth of 300 mm are saturated
- (d) all of these

**Q.12. The infertility of the soil in waterlogged area is due to**

- (a) death of bacteria causing nitrification
- (b) increase in salinity
- (c) growth of weeds
- (d) all of the above

**Q.13. If a body in equilibrium under a system of forces is given virtual deformation, the virtual work done by the system of forces is equal to the internal virtual work done by the stresses due to that system of forces'. The above principle is applicable to deformations due to**

- (a) loads
- (b) settlement of support
- (c) lack of fit
- (d) all the above cases

**Q. 14. Drainage coefficient depends upon**

- (a) rain fall
- (b) type of soil
- (c) type of crop
- (d) all the above

**Q.15. A solid construction across a river to raise its water level and divert the water into the canal is known as**

- (a) bund (b) barrage (c) weir (d) dam

**Q. 16. A fish ladder is**

- (a) a ladder provided in the canal for the maintenance of canal  
(b) a ladder to climb up dam  
(c) a structure which enables the fish to pass upstream  
(d) none of the above

**Q. 17. A hydraulic jump is formed when**

- (a) the two flows of supercritical velocities meet each other  
(b) the two flows of subcritical velocities meet each other  
(c) a supercritical flow strikes against a subcritical flow  
(d) a subcritical flow strikes against a supercritical flow

**Q.18. Four point loads 8, 15, 15 and 10 kN have centre-to-centre spacing of 2 m between consecutive loads and they traverse a girder of 30 m span from left to right with 10 kN load loading. The maximum shear force at 8 m from left support will be**

- (a) 8.2 kN (b) 25.4 kN (c) 30.2 kN (d) 42.2 kN

**Q.19. Assertion:** Salts of calcium, magnesium, sodium and potassium, present in the irrigation water may prove injurious to plants.

**Reason:** When present in excessive quantities they prevent adequate aeration.

- (a) Both A and R are true and R is the correct explanation of A.  
(b) Both A and R are true but R is not the correct explanation of A.  
(c) A is true but R is false.  
(d) A is false but R is true.

**Q.20. Assertion:** In saline soil plants die due to lack of water. **Reason:** Pure water from within the roots starts flowing out of the roots by osmosis.

- (a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

**Q.21. The ratio of the depth of water level over crest on the downstream of the module to the depth of water level over crest on the upstream of module is known as**

- (a) setting (b) sensitivity  
(c) flexibility (d) drowning ratio

**Q.22. Among the following, which crop has the highest value to delta?**

- (a) wheat (b) vegetables (c) rice (d) cotton

**Q.23. A channel is said to be in regime when**

- (a) silt grade and silt charge are constant  
(b) discharge is constant  
(c) is flowing in unlimited incoherent alluvium of the same character as that transported  
(d) all the above

**Q.24. In border flooding type of water distribution in the forms, the supply ditch is in the form of**

- (a) earthen channel  
(b) lined channel  
(c) underground concrete pipe having risers at intervals  
(d) any one of the above

**Q.25. Which one of the following is the wrong statement about sprinkler irrigation? The conditions favouring the adoption of sprinkler irrigation method are**

- (a) land topography is irregular  
(b) land soil is excessively permeable  
(c) when water table is low  
(d) when water is available with difficulty

**Q.26. Deflection at a point in a beam in the direction perpendicular to its original straight line position measured from the tangent to the elastic curve at another point is given by the moment of  $M/EI$  diagram about the point where deflection is required. This statement is known as**

- (a) Conjugate beam theorem
- (b) Mecaulay's theorem
- (c) Moment area theorem
- (d) Castigliano's theorem

**Q.27. The absolute bending moment in a simply supported beam of span 10 m due to a moving load of 40 kN/m spanning over 5 m is**

- (a) 375 kN m at 2.5 m from end A
- (b) 375 kN m at midpoint
- (c) 375 kN m at 3.75 m from end A
- (d) 500 kN m at midspan

**Q.28. In case of a three-hinged arch at a point V is vertical shear, H is horizontal thrust and  $q$  is the angle made by tangent to horizontals. The normal thrust N and radial shear Q are given by**

- (a)  $V \cos q + H \sin q$  and  $V \cos q - H \sin q$
- (b)  $V \sin q + H \cos q$  and  $V \sin q - H \cos q$
- (c)  $V \sin q - H \cos q$  and  $V \sin q + H \cos q$
- (d)  $V \cos q - H \sin q$  and  $V \cos q + H \sin q$

**Q.29. In a two-hinged parabolic arch, A. if support yields horizontal thrust increases B. if, ribshortening is considered, horizontal thrust reduces Select your answer code from the following:**

- (a) Both A and B are true
- (b) A is true but B is false
- (c) A is false but B is true
- (d) Both A and B are false

**Q.30. The systematic development of slope deflection method in the matrix form is known as to**

- (a) stiffness matrix method
- (b) displacement matrix method
- (c) equilibrium method
- (d) all the above

**(Space for Rough Work)**

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**Q.31. The element  $d_{ij}$  if a flexibility matrix is**

- (a) the displacement at coordinate j due to a unit force at coordinate i
- (b) the displacement at coordinate i due to a unit force at coordinate at j
- (c) the force at coordinate j due to a unit displacement at coordinate at i
- (d) the force at coordinate i due to a unit displacement at coordinate at j

**Q.32. The moment which makes all the fibres at the section to yield is known as**

- (a) flexural rigidity
- (b) moment of resistance
- (c) plastic moment capacity
- (d) yield moment

**Q.33. The shape factor of a I section is**

- (a) 1.2 (b) 1.5 (c) 2.0 (d) none of the above

**Q.34. 'For a given structure and loading, if these exist any distribution of bending moment throughout the section which is both safe and statically admissible with a set of loads W, the value of W must be less than or equal to the collapse load  $W_c$ '. The above theorem is known as**

- (a) kinematic theorem
- (b) static theorem
- (c) uniqueness theorem
- (d) none of the above

**Q.35. The run off a drainage basin is**

- (a) Initial recharge + ground water accretion + precipitation
- (b) Precipitation + ground water accretion + initial recharge
- (c) Precipitation - ground water accretion + initial recharge
- (d) Precipitation - ground water accretion - initial recharge

**(Space for Rough Work)**

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**Q.36.**

If the area of storm hydrograph is equal to  $10^2$  cm, the ordinates of a unit hydrograph may be obtained by dividing the ordinates of the storm hydrograph by

- (a) 1            (b) 2            (c) 3            (d) 4

**Q.37.** Rain simulators are used for the determination of

- (a) evaporation            (b) precipitation  
(c) infiltration capacity (d) none of these.

**Q.38. Pick up the incorrect statement from the following**

- (a) At two meteorologically homogeneous stations, the average annual precipitation is same  
(b) If the average annual precipitation at two places is same these are meteorologically homogeneous stations  
(c) Neither (a) nor (b)  
(d) Both (a) and (b).

**Q.39. The time required by rain water to reach the outlet of drainage basin, is generally called**

- (a) time of concentration  
(b) time of overland flow  
(c) concentration time of overland flow  
(d) duration of the rainfall

**Q.40. Discharge curve may be extended by logarithmic method if**

- (a) cross section of river is uniform  
(b) river is broader and shallower  
(c) river is of any type  
(d) none of these.

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**THE END**

**(Space for Rough Work)**