

Civil - 5th Sem.
Imp. Question:

Date :

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Sub: Water Supply & Treatment

Q:1 Objective of water supply scheme & its importance (Diagram)

Q:2 Explain different kinds of water demand for estimate the total quantity of water requirement.

Q:3 What do you mean by population forecasting? and what are the various Methods, etc. for the forecasting? (Numerical, included)

Q:4 What are the physical, chemical & bacteriological analysis of water and also explain water borne disease.

Q:5 Objective & sequence of conventional treatment plant.

Q:6 Process of sedimentation & its design aspect.

Q:7 What are the different types of filters used for treatment (design example)

Q:8 How water is to be soft, and removal of taste & odour.

Q: 9 Types of Intakes & their structure

Q: 10 What are the different methods used for water conveyance system.

Q: 11 What are or Layout of Distribution System (four system)

Q: 12 Explain pipe materials & fittings.

Q: 13 Distribution Reservoir, function & its storage capacity.

Q: 14 How water is supply in building and the what do you understand by plumbing system.

Q: 15 Explain O.S.D, D.M, and valves and appurtenances in water supply scheme.

- Q-1 Design steps and numerical problems for riveted connections?
- Q-2 Design steps and numerical problems for welded connections?
- Q-3 Define :- rivet, gross diameter of rivets, pitch of rivets, gusset plate, lap and butt joints, riveting, rivet value and Efficiency?
- Q-4 Define :- Welding, fillet weld (side & end weld), Size of fillet weld, throat thickness?
- Q-5 Design steps and numerical problems for tension members?
- Q-6 Define :- forms of tension members, net sectional Area and strength of a tension member?
- Q-7 Design steps and numerical problems on compression members?
- Q-8 Define :- struts & columns, radius of gyration and slenderness ratio, continuous and discontinuous members? Also tacking of rivets?
- Q-9 Design steps and numerical problems on slab base and gusseted base?
- Q-10 Explain :- effective length (all conditions) & common sections for columns?

Q-11 What is plate girder? Design steps? Elements of plate girder? What is curtailment of flange plate? Also. Explain beam to column connections? [Every diagram must be made neat and clean]

Q-12 Assumptions in the theory of simple bending. Explain moment of Inertia, bending moment, shear force, effective span, section modulus and moment of resistance? Web crippling and buckling?

Q-13 Design steps and numerical problems for supported beams?

Q-14 Design steps and numerical problems for unsupported beams?

Q-15 Design steps and numerical problems for built up beams?

Q-16 Design steps of Gantry girder? Briefly define Gantry girder with working and various types of loads acting on it?

- Q-1 Define :- Water content, Void Ratio, Porosity, unit weight and Specific Gravity?
- Q-2 Derive the relation:- between e and n ?
- Q-3 Derive the relation b/w e , w , G_s and S ?
- Q-4 What is permeability and factors affecting permeability?
- Q-5 A soil sample with specific gravity of solids 2.70 has a mass specific gravity of 1.84. Determine the void Ratio?
- Q-6 Explain Indian Standard Soil Classification System? Also Explain the plasticity chart?
- Q-6 What is the difference b/w compaction and consolidation. Also the factors affecting compaction?
- Q-7 Explain the variable head permeameter and also derive its expression?
- Q-8 Derive the expression for the principle of effective stress?
- Q-9 What are the advantages of triaxial test over direct shear test?
- Q-10 Explain direct shear test and triaxial test and unconfined compression test?
- Q-11 A masonry dam has pervious sand as foundation. Determine the max. permissible upward gradient, if a factor of safety is 4 is required against boiling? For the sand, $n = 45\%$ and $G_s = 2.65$.

Q-12 Numerical Questions on Pumping out test and Variable head permeability test for determining the coefficient of permeability?

Q-13 Derive the expression for one-dimensional flow - Laplace's equation?

Q-14 Explain Boussinesq Equation and Newmark's influence chart?

Q-15 What is Rebhann's construction and ~~Coul~~ Culmann's graphical construction and also Coulomb's earth pressure theory?

Q-16 Numerical problems on coeff. of consolidation, consolidation settlement?

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- Q1: Design the main features of 20 years road development in India.
- Q2: Give the classification of road, and explain the highway alignment and survey and planning.
- Q3: Define friction, carriage way, formation width, camber, SSD, SD, & OSD.
- Q4: Design aspects in stopping sight distance and overtaking sight distance.
- Q5: Give the purpose of extra widening? and explain the providing of super-elevation in the field. (Numerical)
- Q6: Design aspects of different types of curve, such as horizontal & vertical & transition ^{curve} etc ^{with} (Numerical)
- Q7: Explain traffic characteristics and traffic survey and briefly describe road user and vehicular characteristics, & PCV.
- Q8: What are causes and preventing measures for road accident, explain?
- Q9: Give IRC specification for suitability of agg. & explain soil subgrade evaluation.

Q:10 Explain different types of road agg. and bitumen test, and their procedure.

Q:11 Explain system of railways & permanent way and gauge types.

Q:12 What are the rails & their function & also explain the length and types of rails.

Q:13 How many types are used in railways? and explain about ballast & their sizes.

Q:14 Briefly describe about fixture and fastening & types of spikes, bolts & keys.

Q:15 How tunnel is classified and what are the different types of shapes & cross-section of the tunnel.

Q:16 Give purpose and construction of shaft and lining.

Q:17 How tunneling is done in hard rock and soft soil/rock? (construction procedure).

Q:18 Draw the cross-section of a NH in embankment and cutting & explain types of gradient.

Q:19 Give classification of signals & yards, & types of crossing.

Q:1 Define hydrology and Explain hydrologic cycle with neat and clean diagram.

Explain

Q:2 Form 2 types of precipitation, with its characteristics in India.

Q:3 How precipitation is measured (Rain gauges)?

Q:4 How you estimate the missing data (With Numerical)

Q:5 Explain different types of Evaporimeters and Empirical relationships.

Q:6 What do you mean by evapo-transpiration and how we measure it?

Q:7 Explain infiltration process & its capacity & measurement (With Numerical)

Q:8 How we measure the velocity? (Area-vel. method, moving boat & slope area method)

Q:9 Define Run-off & its relationship with rainfall. Also explain about its estimation.

Q:10 Factor Affecting the shape of hydrograph, & components of hydrograph.

Q:-11 What do you understand by UH (Unit hydrograph) & use and limitation of UH (With Numerical)

Q:-12 What do you understand by Ground water & its Saturated formation, & Aquifers properties

Q:-13 Derive an expression for compressibility of Aquifers

Q:-14 Steady State flow to wells or Thiem's equilibrium formulae for confined and unconfined Aquifer)

Q:-15 Explain Different types of method in unit hydrograph such as rational method, UH, method, & empirical formulae.

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Ques:-1 Find the root of the equation $\cos x = x e^x$ using bisection method.

Ques:-2 Find by Newton's method, the real root of the equation $3x = \cos x + 1$

Ques:-3 Apply Gauss Jordan method to solve the equation

$$x + y + z = 9$$

$$2x - 3y + 4z = 13$$

$$3x + 4y + 5z = 40$$

Ques:-4 Solve by Jacobi's iteration method, the eq.

$$10x + y - z = 11$$

$$x + 10y + z = 28$$

$$x - y + 10z = 35$$

Ques:-5 Apply Gauss-Seidel iteration method, solve the eq.

$$x = \frac{1}{20}(17 - y + 2z)$$

$$y = \frac{1}{20}(-18 - 3x + z)$$

$$z = \frac{1}{20}(25 - 2x + 3y)$$

Ques:-6 Solve the equation by Relaxation method,

$$10x - 2y - 3z = 205$$

$$-2x + 10y - 2z = 154$$

$$-2x - y + 10z = 120$$

Ques:-7 Find the largest eigen value and corresponding eigen vector of the matrix

$$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix} \text{ using Power method.}$$

Que: 8 using Jacobi's method find all eigen value and eigen vector of the matrix

$$A = \begin{bmatrix} 1 & \sqrt{2} & 2 \\ \sqrt{2} & 3 & \sqrt{2} \\ 2 & \sqrt{2} & 1 \end{bmatrix}$$

Que: 9 using the method of least squares, fit the curve $y = ax^2 + b/x$ to the following data.

x :	1	2	3	4
y :	-1.51	0.99	8.88	7.66

Que: 10 using Newton's forward formula find the value of $f(1.6)$ if

x :	1	1.2	1.8	2.2
f(x) :	3.49	2.82	5.96	6.5

Que: 11 Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using

i) Trapezoidal rule

ii) Simpson's $1/3$ rule.

Que: 12 Solve $y' = x + y$ $y(0) = 1$ by Taylor's series method. Hence find the values of y at $x = 0.1$, and $x = 0.2$

Que: 13 using modified Euler method, find an approximate value of y when $x = 0.3$ given that $\frac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$

-14 using Runge-kutta method of fourth order.

$$\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$$

with $y(0) = 1$ at $x = 0.2$

Ques:-15 using Milne's method find $y(4.4)$

given $5xy' + y^2 - 2 = 0$ given.

$$y(4) = 1, \quad y(4.1) = 1.0049, \quad y(4.2) = 1.0097$$

$$y(4.3) = 1.0187$$

Ques:-16 Solve the Laplace eq. $\frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial y^2} = 0$ by

- Jacobi's method
- Craws - Seidel method

