AR16

CODE: 16CE2005 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January-2019

ENVIRONMENTAL ENGINEERING-I

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a	What is a waterborne disease? Give at least four examples and explain how we can prevent these diseases from spreading.	6
	b	What is design period of a water supply project? Why do we need to consider different design period for various components of the project? What are the typical design periods of various components of a water supply project?	8

(OR)

2.	a	What are the factors affecting growth of population in a town? How does population growth affect the design of water supply schemes?	6
	b	Name any four parameters of water quality required to be tested under IS:10500 for drinking water. Mention the principle of the test carried out for measuring them and the acceptable range for drinking water.	8

UNIT-II

3.	a	How does the demand for water fluctuate over a 24 hour period? In case of a continuous supply system, how does the system accommodate these fluctuations?	6
	b	Explain how the mass curve method is applied to determine the balancing storage of a service reservoir to accommodate the fluctuations in demand, emergencies, fire fighting needs.	8

(OR)

4.	a	What are the various types of joints used in distribution pipes? Explain the pipe materials or purposes for which these joints are specially suited using sketches?	6
	b	What are different types of valves used in distribution pipes? Explain the purposes of any 4 valves for which they are specially used along with neat sketches.	8

UNIT-III

5. a What are the different types of Sedimentation Tanks? (based on method of operation) Explain their operation and important features such as velocity of water flow, detention time, overflow rate, duration of cycle etc., Use sketches wherever relevant to explain. 8

   b For Horizontal Flow through a rectangular tank, derive an expression for settling velocity and show that it is equal to the surface loading rate of the tank. 6

(OR)

6. a What is a coagulant? How does it help in the clarification of raw waters? Explain the chemical reaction of at least 4 commonly used coagulants in treatment plants. 10

   b Write a note on any two common devices used for dry feeding of coagulant . 4

UNIT-IV

7. a With the help of a neat sketch, explain at least four essential features of a slow sand filter. 10

   b Explain any four commonly encountered operational troubles of gravity filters and remedies for avoiding them. 4

(OR)

8. a Explain the working of various Chlorinating agents viz. 1.Bleaching Powder, 2. Chloramines 3.Free Chlorine (gas) 4.Chlorine Dioxide in disinfection of water supplies. 8

   b Write about any six factors that affect the bactericidal efficiency Chlorine. 6

UNIT-V

9. a Write about the physical and chemical characteristics of municipal solid waste. 4

   b Write a note on Refuse, Reduce, Reuse, Recover, Recycle (5R's) strategy for reducing wastage of resources. 10

(OR)

10. Explain briefly about disposal of municipal solid waste by engineered landfill. 14

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CODE: 16ME2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January-2019

FLUID MECHANICS & HYDRAULIC MACHINERY

(Common to EEE & ME)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the terms 6M
   i) Surface tension ii) Capillarity
   iii) Vapour pressure
   b) Distinguish between: (i) Steady and Un-steady flow (ii) Uniform and Non-uniform flow (iii) Laminar and Turbulent flow (iv) compressible and incompressible flow. 8M

(OR)

2. a) Define : 4M
   i)Steam line ii)Streak line iii)Stream tube.
   b) Given that $u= x^2-y^2$ and $v=-2xy$ determine the stream function and the potential function for the flow. 10M

UNIT-II

3. a) Derive Euler's expression for steady fluid flow. 4M
   b) Calculate 10M
   i) The pressure gradient along the flow
   ii) Average velocity iii) The discharge
   for an oil of viscosity 0.02N-sec/m^2 flowing between two stationery parallel plates 1m wide maintain 1cm apart if the velocity between the plate is 2m/sec.

(OR)

4. a) Derive an expression for the coefficient of discharge through a venturimeter. 7M
   b) A orifice meter with orifice diameter 15cm is inserted in a pipe of 30cm diameter the pressure difference measured by mercury oil differential manometer on the two sides of orifice meter gives a reading of 50cm of mercury. Find the rate of flow of oil of Sp.gr.0.9 when the coefficient of discharge of the meter is 0.64 7M

UNIT-III

5. a) Derive Darcy's Weisbach equation for calculating pressure drop 10M
   b) Lubricating oil at a velocity of 1m/sec (average) flows through a pipe of 100mm inner diameter determine whether the flow is laminar or turbulent also determine the friction factor, and the pressure drop over 10m length. Density =930kg/m^3, dynamic viscosityμ= 0.1Nsec/m^2. 4M
6. a) Derive an expression for the loss of head due to sudden contraction. 7M
   b) Three pipes of 400mm, 350mm and 300mm, diameters are connected in series between two reservoirs with a difference in level of 12m. The friction factors are 0.024, 0.021and 0.019 respectively, the lengths are 200m, 300m and 250m respectively. Determine the flow rate neglecting minor losses. 7M

UNIT-IV

7. a) Explain the terms cavitaion, water hammer with respect to performance of hydraulic turbines. 4M
   b) A 20cm pipe 600m long with friction factor of 0.02 carries water from a reservoir to a turbine with a difference in head of 90m. the friction loss in the nozzle is $0.05V_s^2/2g$ determine the diameter of the jet which will result in maximum power. 10M

(OR)

8. a) Explain the process of governing in turbines with a neat diagram. 4M
   b) An inward flow reaction turbine of the Francis type operates with a flow rate of 1.67m^3/sec runs at 416 rpm. The available head is 81m.the blade inlet angle is 120 with the direction of wheel velocity, the flow ratio is 0.2. hydraulic efficiency is 92% determine runner diameter , power developed and speed ratio 10M

UNIT-V

9. a) Explain in detail the classification of pumps. 4M
   b) The following details refer to a centrifugal pump , outer dia 30cm, inner dia 15cm,blade angle at inlet 30^0 , blade angle at outlet 25^0 speed 1450 rpm, the flow velocity remains constant, the whirl at inlet is zero. Determine the work done per kg. if the manometric efficiency is 82%. 10M

(OR)

10. a) Explain the function of air vessel in a reciprocating pump, with a neat diagram if necessary. 4M
    b) In a reciprocating pump the bore is 180mm and stroke is 280mm water level is 5m from the pump level the suction pipe is 110 m diameter and 9m long the atmospheric pressure head is 10.3m water determine the maximum speed if the head at pipe suction should not be less than 2.5m head of water if the suction pipe diameter is increased 125mm and length reduced to 6m what will be the maximum speed. 10M

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CODE: 16EE2005 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January-2019

LINEAR CONTROL SYSTEMS

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit

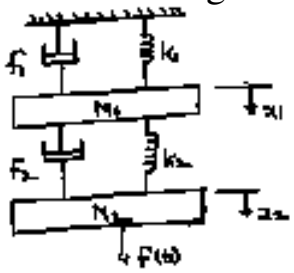
All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

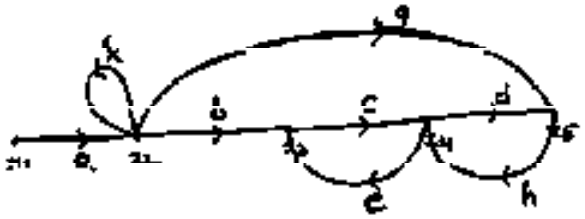
1. a) What are the advantages and disadvantages of Close loop control systems? 7M

   b) Obtain the mathematical system equations and its corresponding mechanical circuit diagram? 7M



(OR)

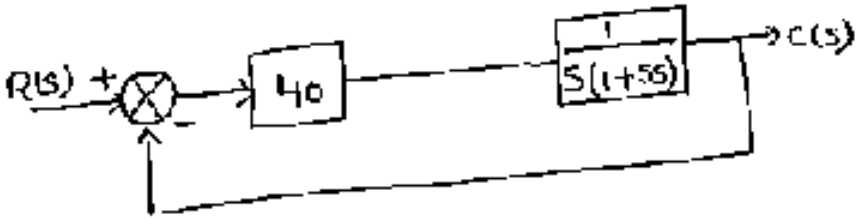
2. Determine the overall transfer function for the Signal flow graph shown below? 14M



UNIT-II

3. a) Explain the working of a two phase AC servomotor with neat schematic? State its advantages when compared to DC servomotor? 7M

   b) The steady state error due to a unit step input shown in fig is? 7M



(OR)

4. The overall transfer function of a control system is given by 14M $\frac{C(S)}{R(S)} = \frac{14}{S^2+1.4S+14}$ it is desired that the damping ratio be 0.7. Determine the derivative rate feedback constant K_t and compare rise time, peak time, maximum overshoot and steady state error for unit ramp input without and with derivative feedback control?

UNIT-III

5. Sketch the root locus plot for the open loop transfer function given below G(S)H(S) = $\frac{K(S^2+4)}{S(S+2)}$. Calculate the value of K at breaking point? 14M

(OR)

6. Determine the stability of a system having the following characteristic equation? 14M

   $S^6 + 3S^5 + 6S^4 + 12S^3 + 12S^2 + 12S + 8 = 0$?

UNIT-IV

7. Construct Bode plot for the system whose open loop transfer function is given below and determine GM & PM? 14M

   $$G(S)H(S) = \frac{1000}{S(1+0.1S)(1+0.001S)}$$

(OR)

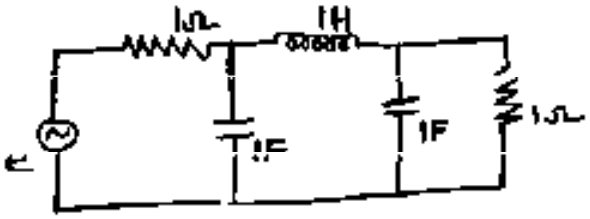
8. Using nyquist criterion, determine the stability of the feedback system which has the following open loop transfer function? 14M

   $G(S)H(S) = \frac{5(S+3)}{S(S-1)}$

UNIT-V

9. a) Design of lead compensation for a system whose transfer function is $G(S) = \frac{K}{S(1+0.1S)(1+0.001S)}$ it will fulfil the following specifications — 10M
   Phase margin $\geq 45^0$
   Velocity constant $K_v = 1000\ sec^{-1}$?

   b) Write down the state equations and hence develop a state variable representation for the RLC network shown in fig? — 4M



(OR)

10. a) Determine the transfer function matrix for the data given below? — 7M

$$A=\begin{bmatrix}-3 & 1\\ 0 & -1\end{bmatrix};\ B=\begin{bmatrix}1\\ 1\end{bmatrix};\ C=[1 \quad 1] \text{ and } D=0$$

   b) Check the controllability and observability for the following system? — 7M

$$A=\begin{bmatrix}0 & 1\\ -1 & -2\end{bmatrix};\ B=\begin{bmatrix}1\\ -1\end{bmatrix};\ C=[1 \quad 1]$$

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CODE: 16CS2004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January-2019

OBJECT ORIENTED PROGRAMMING

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the characteristics of Object Oriented Programming.	7M
	b)	Describe the rules of precedence and associatively for the operators.	7M
		(OR)	
2.	a)	Write a C++ Program to display whether a given number is prime or not using functions.	7M
	b)	What is meant by function overloading? Demonstrate with an example C++ program.	7M

UNIT-II

3.	a)	What is Class? Explain the relation between class and object with neat diagrams.	7M
	b)	What is Destructor? Demonstrate the use of destructor with suitable C++ Program.	7M
		(OR)	
4.	a)	Write a C++ program to concatenate two string using overloaded '+' operator.	7M
	b)	List out the advantages of overloading.	7M

UNIT-III

5.	a)	List out the advantages of Inheritance.	7M
	b)	Write a C++ program to implement multiple inheritance.	7M
		(OR)	
6.	a)	What is abstract class? Demonstrate with suitable C++ program	7M
	b)	Write a C++ program to demonstrate the order of execution of constructors in the case multilevel inheritance.	7M

UNIT-IV

7.	a)	Write a C++ program to pass objects as arguments to a function.	7M
	b)	What is pure virtual function? Explain with an example program.	7M
		(OR)	
8.	a)	Explain in detail the uses of pointers and references to the base classes.	7M
	b)	Write an example C++ program to demonstrate late binding.	7M

UNIT-V

9.	a)	Explain function template with an example C++ program.	7M
	b)	Write a C++ program to handle divide by zero exception using exception handling techniques.	7M
		(OR)	
10.	a)	Write a generic C++ program to subtract both integer and floating point values.	7M
	b)	Write a C++ program to merge the contents of two files into a third file.	7M

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