

Shri Shankaracharya Institute of Professional Management & Technology
Department of Civil Engineering

Class Test – II Session: January - June, 2022 Month – June

Semester – 6th Subject – EEE&C, Code – C020613(020)

Time Allowed: 2 hrs Max Marks: 40

Note: -Question (a) is compulsory. Attempt any two from b, c and d form Part I and Part II.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	COs
Part- I				
(a)	State purpose of rate analysis.	[4]	Understand	CO3
(b)	Analyze the rate for 12cm thick plaster 1:3.	[8]	Analyze	CO3
(c)	Analyze the rate for Brick work in super structure 1.6.	[8]	Analyze	CO3
(d)	Analyze the rate for 2.5 cm thick cement concrete floor 1.3.6	[8]	Analyze	CO3
Part- II				
(a)	Differentiate between Security Deposit and Retention Money	[4]	Analyze	CO4
(b)	Describe the different types of contract. Also Write their advantages and disadvantages.	[8]	Understand	CO4
(c)	Explain the essential requirement of Valid contract.	[8]	Understand	CO4
(d)	Describe in brief types of tender.	[8]	Understand	CO4

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
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Part I

1)	Explain the mechanism of Coagulation in water treatment. What are the functions of alum and copperas when used as coagulants?	[4]	Understand	CO2
2)	Classify the types of sedimentation processes with detailed explanations.	[4]	Understand	CO2
3)	Derive the formulae of settling velocity using Stokes Law.	[4]	Analyze	CO2
4)	Describe the mechanism of filtration using 4 different theories	[4]	Analyze	CO2
5)	Discuss in brief two processes for water softening.	[4]	Understand	CO2

Part II

1)	<p>Water works of a town is provided with sedimentation tank of size 40m×15m×3.5m. If 115 ppm of suspended solids are present in the water and 60% are removed in the basin, Specific gravity of solids= 3.1, determine the following, if 8.5×10^6 litres of water is treated daily</p> <p>i) Detention time ii) Avg. flow of water through the tank iii) Volume of solids deposited in the tank iv) Overflow Rate</p>	[8]	Apply	CO2
2)	<p>A coagulation sedimentation treatment plant treats 40 MLD of water. Quantity of filter alum consumed at the plant is 21mg/L. If the raw water has an alkalinity of 4.6mg/L as CaCO₃, Determine the quantity of alum and quick lime (80% purity) required annually at the treatment plant.</p>	[8]	Apply	CO2
3)	<p>The Population of a city is 50000 and the per day capita consumption of water is 130 litres. Calculate the following in respect of rapid sand filters if rate of filtration is 75 lit/m²/min.</p> <p>i) Total Discharge required including backwashing if 3% goes for backwashing ii) Design discharge if 25 mins is lost in backwashing iii) Total area of filters required iv) Number of filters required v) Dimensions of each unit of filter vi) Wash water discharge if rate of washing is 30cm/min vii) Diameter of lateral and manifold drains if 13mm perforations is used at 20cm c/c spacing.</p>	[8]	Apply	CO2

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	COs
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Part-1

A. Define Tension member and shear lag. [4] Understand 3

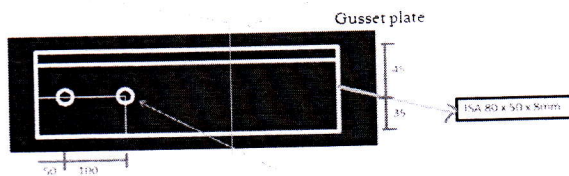
(i) Compute the tensile strength of an angle section ISA 150 x 115 x 8 mm of Fe 410 grade of steel connected with the gusset plate as shown in figure for the following cases:

- (a) Gross- section yielding
(b) Net section fracture

(ii) Determine the block shear strength of the tension member shown in figure. The steel is of grade Fe410

[16] Analyze 3

B.



18 mm diameter bolt

C. Design a bridge truss diagonal subjected to a factored tensile load of 300kN. The length of the diagonal is 3.0m. The tension member is connected to a gusset plate 16 mm thick with one line of 20 mm diameter bolts of grade 8.8.

[16] Analyze 3

Part- II

A. Define Slenderness ratio and effective length [4] Understand 3

Two plates of 16mm and 14mm thickness are to be joined by a groove weld as shown in figure. The joint is subjected to a factored tensile force of 430kN. Due to some reason the effective length of the weld that could be

B. provided was 175mm only. Check the safety of the joint if

- (a) Single-V groove weld is provided
(b) Double-V groove weld is provided.

[16] Analyze 2

C. A groove weld is to connect two plates 180mm X 18mm each. Determine the design bending strength of the joint, if it is subjected to a moment of 13kN.m. Also determine the adequacy of the joint if the Shear force at the joint is 200kN. Assume the weld to be of double-U shop welded

[16] Analyze 2



Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
Part I				
A.	What is meant by the term contract? Explain briefly the importance of contract?	[4]	Understand	CO5
B.	Discuss the various types of contract. Determine the critical path for the network given below:	[8]	Understand	CO5
C.		[8]	Analyze	CO2
D.	Calculate the activity times and floats of the activities in the network given below:	[8]	Analyze	CO2
Part II				
A.	Explain briefly dispute resolution method?	[4]	Understand	CO5
B.	Explain the various clauses of a contract?	[8]	Understand	CO5
C.	Explain the terms: 1. Liquidated damage 2. Direct & Indirect cost of construction 3. Contract durations 4. Variation of contract	[8]	Understand	CO5
D.	What is termination of contract? Explain the various causes of termination of contract.	[8]	Understand	CO5

Note: - In Part I & II, Question A is compulsory and attempt any two from B, C & D.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
Part I				
A.	Explain modulus of elasticity of concrete.	[4]	Understand	CO3
B.	What are the factors affecting strength of concrete. Explain it.	[8]	Understand	CO3
C.	The strength of fully matured concrete was found to be 45N/mm^2 . Find the strength of an identical concrete at the age of seven days when cured at an average temperature during day time at 20°C and night time at 10°C . (Take constant $A = 32$ and $B = 54$).	[8]	Evaluate	CO3
D.	Explain creep on concrete and factor affecting it.	[8]	Understand	CO3
Part II				
A.	State the principle of mix design.	[4]	Understand	CO4
B.	Write Short Notes on: (1) Shotcreting (2) Fiber Reinforced Concrete	[8]	Understand	CO5
C.	Explain the effect of chemical and mineral admixture on properties of hardened concrete.	[8]	Understand	CO3
D.	Explain British Method of Mix Design.	[8]	Understand	CO4