Shri Shankaracharya Institute of Professional Management & Technology, Raipur

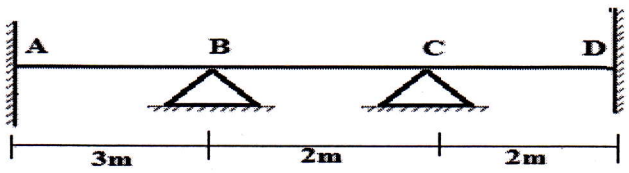
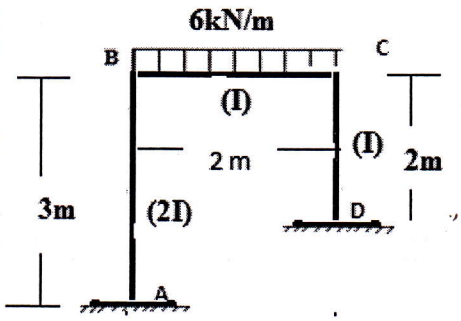
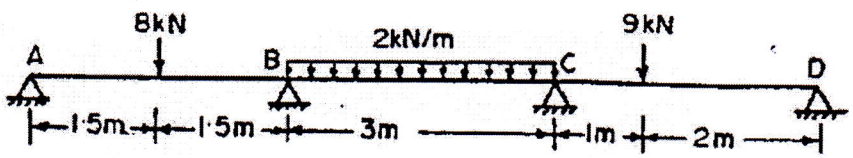
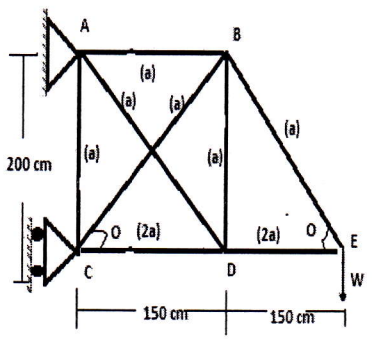
Department of Civil Engineering

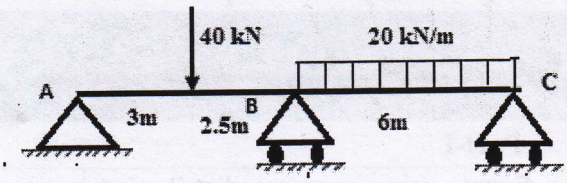
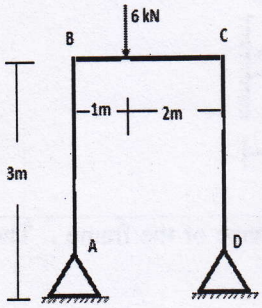
Class Test – II Session: Jul – Dec, 2021 Month – December

SSIPMT **Semester – 5th** **Subject – Structural Analysis-II** **Code – C020531(20)**

Time Allowed: 2 hrs Max Marks: 40

Note: - Attempt any two Questions from every part.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	COs
	Part-I			
A.	Analyze the continuous beam as shown in figure, using moment distribution method and find support moments if support B sinks by 30 mm. Draw the bending moment diagram and the deflected shape of the beam. Take $E=2\times10^5$ N/mm^2 and $I=3\times10^6$ mm^4 constant for the whole beam. 	[10]	Analyze	CO3
B.	draw the bending moment diagram and sketch the deflected shape of the frame . The ends A and D are fixed and BC is loaded with U.D.L. 6 kN/m. 	[10]	Evaluate	CO3
.	Analyze the beam shown in fig. by moment distribution method. Plot the bending moment diagram and sketch the deflected shape of the beam if the support A is settles by 10 mm, B settles by 30 mm and C settles by 20 mm. the moment of inertia of the whole beam is 2.4 x 10^6 mm^4 units. Take E = 2 x 10^5 N/mm^2. 	[10]	Analyze	CO3
	Part-II			
A.	Find the axial force in the member BC of the truss shown in Figure. All the Members are of the same material. 	[10]	Evaluate	CO2

B.	Draw the bending moment diagram of the beam as shown in figure using strain energy method. 	[10]	Evaluate	CO2
C.	A portal frame ABCD is hinged at A and D and rigid joint B and C. The frame is loaded as Shown in figure using method of min. strain energy Analyze the frame and plot the B.M.D. 	[10]	Analyse	CO2

Shri Shankaracharya Institute of Professional Management &Technology, Raipur

Department of Civil Engineering

Class Test – II Session: JULY – DEC, 2021 Month –DECEMBER

Semester – 5th Subject –Structural Engg. Design –I **Code –C020511(020)**

Time Allowed: 2 hrs. Max Marks: 40

Note: -Part A of each question is compulsory. Attempt any 2 from Part B, C & D in each question. Use of IS 456:2000 is permitted. Assume the suitable data if required and mention if clearly.Draw neat sketches wherever required.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
	Part-I			
A.	What do you understand by partial safety factor in LSM?The maximum strain in steel at the outermost fiber is -	[4]	Understand	CO5
B.	A RCC beam of 300 mm width and 500 mm effective depth is subjected to factored moment of 175 KN.m. If M20 concrete and Fe500 steel are used, find the area of steel required.	[8]	Apply	CO4
C.	Design the section for a doubly reinforced beam to resist BM of 185 KN.m the beam section is restricted to 350 X 700 mm. Assume 50 mm effective cover. M20 concrete and mild steel reinforcement is used.(Use LSM)	[8]	Analyze	CO4
D.	Design a simply supported rectangular beam of clear span of 6 m and subjected to a super imposed load of 50 KN/m at service state consider support width of 30 cm. Use M20 concrete and Fe415 steel.	[8]	Analyze	CO4
	Part-II			
A.	What is a One-way slab and a two-way slab? Write the expression for calculating effective flange width (b_f) for an isolated T-beam and label it.	[4]	Understand	CO5
B.	A simply supported RCC beam 250 mm wide and 450 mm deep (effective) is reinforcement with 4-18mm dia. Bar. Design the shear reinforcement if M20 grade of concrete and Fe415 steel is used and beam is subjected to a shear force of 150 KN at service state.	[8]	Apply	CO4
C.	Determine the flexural reinforcement requirement at midspan of T beam, The span is 10 m and design moment at midspan under factored load is 800 KN.m. Consider Fe415 steel, M20 assume that the beam is subjected to moderate exposure condition. Width of Flange = 1500 mm Thickness of Flange = 100 mm Overall height of the beam = 700 mm Thickness of web = 300 mm	[8]	Apply	CO4
D.	Design a reinforcement concrete slab for a room of clear dimension 4 m X 5 m. The slab is supported on walls of width 300 mm. The slab is carrying a live load of 4 KN/m^2 and floor finish 1 KN/m^2. Use M 20 concrete and Fe 415 steel.	[8]	Analyze	CO4

Shri Shankaracharya Institute of Professional Management & Technology, Raipur

Department of Civil Engineering

Class Test – II Session: July-Dec, 2021 Month – December

Semester – 5th Subject – Geotech Engineering Sub. Code – C020513(020)

Time Allowed: **2 hrs.** **Max Marks: 50**

Note: - In Part I & II, Question A is compulsory and attempt any two from B, C & D. Attempt all questions of part III.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
	Part I			
A.	Explain the followings: (i) Permeability (ii) Quick Sand Condition	[4]	Understand	CO2
B.	Explain the factors affecting permeability of soil.	[8]	Understand	CO2
C.	Calculate the coefficient of permeability of a soil sample 6 cm in height and 50 cm^2 in cross section area, if a quantity of water equals to 430 cc passed down in 10 minutes under an effective constant head of 40 cm. On oven drying, the test specimen weighted 4.98N. Taking G = 2.65, calculate the seepage velocity of water during the test.	[8]	Evaluate	CO2
D.	In a site reclamation project, 2.5 m of graded fill (γ =22 kN/m^3) were laid in compacted layers over an existing layer of silty clay (γ_{sat} = 18 kN/m^3) which was 3 m thick. This was underlain by a 2 m thick layer of gravel (γ_{sat} = 20 kN/m^3). Assuming that the water table remains at the surface of the silty clay draw the effective stress profiles for case (i) before the fill is placed and case (ii) after the fill has been placed.	[8]	Evaluate	CO2
	Part II			
A.	Explain the followings: (i) Comparison between compaction and consolidation (ii) Mohr-Coulomb Theory	[4]	Understand	CO3
B.	Explain Terzaghi's one dimensional consolidation theory with assumptions.	[8]	Understand	CO3
C.	Derive the relationship between shear strength parameters and principal stresses.	[8]	Apply	CO3
D.	Consolidated undrained test was performed on two identical samples. The observation at failure are as follows.	[8]	Evaluate	CO3

Stresses	Specimen 1	Specimen 2
Cell pressure (kN/m^2)	250	350
Deviator stress (kN/m^2)	180	240
Pore pressure (kN/m^2)	100	150

Determine the effective angle of shearing resistance and cohesion value.

	Part III			
(a)	Briefly discuss about the soil exploration methods.	[5]	Understand	CO5
(b)	Describe soil samples and types of samplers.	[5]	Understand	CO5

Shri Shankaracharya Institute of Professional Management & Technology, Raipur

Department of Civil Engineering

Class Test – II Session: July-December, 2021 Month – December 2021

Semester – 5th Subject –HYDROLOGY &WATER RESOURCES ENGINEERING

Code –C020512 (020) Time Allowed: 2 hrs. Max Marks: 40

Note: -Part A is compulsory in each section. Attempt any two from part B, C and D. Assume suitable data, if required, and mention it clearly.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
	Section I			
A	Write short notes on: 1. Crop period and base period 2. Intensity of irrigation and G.C.A	4	Understand	CO3
B	Write short notes on 1. Lift irrigation 2. Drip irrigation 3. Ill effect of irrigation	8	Understand	CO3
C	A water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for the crop A is 40% and for crop B is 35%, both the crops being rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of water course if the kor depth for crop A is 10 cm and for B it is 16cm.	8	Analyze	CO3
D	After how many days will you supply water to the soil in order to ensure sufficient irrigation of the given crop, if- (i) Field capacity of the soil = 28% (ii) Permanent wilting point = 13% (iii) Dry density of soil = 1.3 gm/cc (iv) Effective depth of root zone = 70cm	8	Analyze	CO3
	Section II			
A	Write short notes on: (i) Watershed Canal (ii) Contour Canal (iii) Side Slope Canal	4	Understand	CO4
B	A channel section has to be designed for the following data Discharge Q = 30 Cumecs, silt factor f= 1.0 Side slope = $\frac{1}{2}$:1 Also find longitudinal slope.	8	Analyze	CO4
C	Design an irrigation channel on Kennedy's theory, to carry a discharge of 45 cumecs. Take N= 0.225 and M = 1.05. the channel has a bed slope of 1 in 5000.	8	Analyze	CO4
D	Design a trapezoidal shaped concrete lined channel to carry a discharge of 100 cumecs at a slope of 25 cm /km. the side slope of the channel are 1.5 :1, N =0.016 and limiting velocity.	8	Analyze	CO4

Shri Shankaracharya Institute of Professional Management & Technology
Department of Civil Engineering
Class Test – II Session: July-December, 2021 Month – November
Semester – 5th Subject –T.E Code –CO20514(020)
Time Allowed: 2 hrs. Max Marks: 40
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 Traffic Engineering.	[4]	Understand	CO2
B.	What is O&D study?What are the details to be collected in O&D study?	[8]	Understand	CO2
C.	What are traffic signs?Describe the functions & types of traffic signs.	[8]	Understand	CO2
D.	What are traffic signals?Write its advantages & disadvantages.	[8]	Analyse	CO2
	Part II			
A.	What is meant by the term Pavement.	[4]	Understand	CO3
B.	Explain briefly the various design factors that are to be considered in rotary intersection design.	[8]	Understand	CO3
C.	Difference between Flexible & Rigid Pavement.	[8]	Understand	CO3
D.	What is G.I value?Describe the group index method for design of flexible pavement.	[8]	Understand	CO3