SF - 1008

Total No. of Pages : 3

Seat No.	

T.E. (Civil) (Semester - V) Examination, November - 2017

DESIGN OF STEEL STRUCTURES (New)

Sub. Code : 66236

Day and Date : Saturday, 11 - 11 - 2017 **Total Marks : 100**

Time : 10.00 a.m. to 01.00 p.m.

Instructions :

1) **All questions Compulsory.**
2) **Use of IS 800:2007, IS 875, Steel table, Non programmable calculator permitted.**
3) **Figure to the right indicate full marks.**
4) **Draw sketches wherever necessary.**
5) **Assume suitable data if required.**

SECTION - I

Q1) a) What is serviceability Limit state? Explain. [4]

b) Write note on "High Strength Friction Grip (HSFG) bolts." [4]

c) A tension member is subjected to force of 150 KN. The member consists of a plate 75mm × 8mm in size is connected to 10mm thick gusset plate. The grade of steel is Fe 410. Design fillet weld if (a) Weld is provided on two sides of plate in direction of force. (b) Weld is provided on three sides of plate. [8]

Q2) a) Explain in brief with sketches the modes of failure of tension members. [6]

b) A tension member of a truss consist of two angles 75×50×6 which are provided on either side of a 10mm thick gusset plate. 20mm dia. Bolts are used in one row for connecting the member to the gusset plate. Determine design tensile strength of the member and also the number of bolts required to develop the design tensile strength. [12]

OR

b) Design an angle section to carry a factored tensile force of 200 kN. Bolts of 20mm diameter are to be provided for the connection of the member to the gusset plate. Take fy = 250Mpa and fu = 410 Mpa. [12]

P.T.O.

Q3) a) Explain the terms with reference to compression members, (i) Effective length of struts, (ii) Slenderness ratio. **[4]**

b) Two angles 90×60×8 are used as strut 3m long and connected to 10mm thick gusset plate at each end. Determine the design strength of the strut for the following cases. **[12]**

i) When the longer leg of the angle are connected on either side of gusset plate.

ii) When the longer leg of the angle are connected to same side of gusset plate

SECTION - II

Q4) a) Why lacing is provided for column? How much load is taken by lacing. **[4]**

b) Design a 8m long built up column to carry a factored axial load of 1250 KN . The column is restrained in position but not direction at each end. The column shall consist of two channels placed toe to toe at a suitable spacing. **[12]**

OR

b) An ISHB400 @759.3 N/m column carries a factored axial load of 2000 KN. Design a slab base for the column. Assume that the bearing surfaces of the column and base plate are machined. The concrete footing is of M20 grade. **[12]**

Q5) a) What is web buckling and web crippling? How the beam checked against web bucking and crippling? **[6]**

b) A 150mm thick slab is supported on steel beams of effective span 5.25m which are spaced at 3.25m c/c. Allow live load of 3.50 kN/m^2 and a 40mm floor finish at 20 kN/m^3.Design the beam and check it for shear. **[12]**

Q6) a) Draw neat sketch of (i) crane gantry girder assembly (ii) the typical cross sections for gantry girder. **[4]**

b) The Crane system has the following data. Determine the design forces acting on it. [12]

- Crane capacity = 100kN
- Weight of crane girder = 90kN
- Weight of crab,motor,hook = 20kN
- Minimum hook Approach = 1.1 m
- Wheel base = 2.5 m
- Span of gantry girder = 5.5 m
- Weight of gantry girder = 8 kN
- c/c spacing of crane rails = 20 m

The crane is electrically operated.

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Total No. of Pages :3

Seat No.	

T.E. (Civil) (Semester - VI) (Revised) Examination, November - 2017
ENVIRONMENTAL ENGINEERING - II
Sub. Code: 66877

Day and Date :Tuesday, 07 - 11 - 2017 **Total Marks : 100**
Time :2.30 p.m. to 5.30 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Assume suitable data wherever necessary and mention it.**
3) **Figures to the right indicate full marks.**

SECTION-I

Q1) a) Explain the significance of COD and BOD in waste water treatment. **[4]**

b) Draw neat sketch of sewage pumping station and mention the function of various components. **[6]**

c) Determine ultimate first stage and standard BOD of wastewater sample having 2-day 20°C BOD as 250 mg/L. BOD removal constant at 20°C base 'e' = 0.15 per day. **[6]**

OR

c) Determine the velocity of flow and discharge for 800mm diameter circular sewer flowing at half full depth. Gradient=1 in 600, Manning's constant = 0.013. **[6]**

Q2) a) Explain the importance of screens, grit chamber and oil and grease trap in wastewater treatment. **[6]**

b) Based on F/M ratio determine the volume of aeration tank for activated sludge process.
Determine HP of mechanical surface aerators.
Given:- F/M Ratio = 0.5, MLVSS = 3000mg/L
Sewage flow = 5MLD, Influent BOD_5 = 300mg/L **[7]**

P.T.O.

c) Explain the constructional features, operation and mechanism of trickling filter. [5]

OR

c) Compare tapered aeration ASP with extend aeration ASP. [5]

Q3) a) Explain the sludge dewatering methods. [5]

b) What are the advantages, disadvantages and types of stabilization ponds. [5]

c) Design an oxidation pond for treating 10 MLD flow with influent BOD_5=300mg/L. [6]

OR

c) Design a septic tank for 100 users. [6]

SECTION - II

Q4) a) Explain the self purification process of streams. [5]

b) Write the Streeter phelp's equation and give the meaning of the terms in it. [5]

c) Give the effluent standards for stream and land disposal as per MPCB standards. [6]

OR

c) Give the outline of the EIA study. [6]

Q5) a) Give the sources and characteristics of municipal solid waste. [5]

b) Explain the factors affecting composting process. [5]

c) Explain in short methods of sanitary land filling. **[6]**

OR

c) Write a note on Hazardous waste management. **[6]**

Q6) Write short notes on any three **[18]**

a) Sources of air pollution.

b) Atmospheric stability conditions.

c) Bag house filter

d) Ambient air quality standards.

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Total No. of Pages : 3

Seat No.	

T.E. (Civil) (Semester - V) (Revised) Examination, November - 2017
ENVIRONMENTAL ENGINEERING - I
Sub. Code :66237

Day and Date : Tuesday, 14- 11 - 2017 **Total Marks : 100**

Time : 10.00 a.m. to 1.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Assume and mention data if necessary.**

Q1) Answer Any Three of following. **[3 × 6 = 18]**

a) Explain the basis on which the water source is selected for water supply.

b) 'Water should be necessarily treated before municipal supply.' Explain.

c) State details of intake well from its place and importance point of view.

d) Explain design steps for intake well.

e) Write a note on Population Forecasting.

Q2) a) Design a cascade aerator for 10 MLD flow. **[8]**

b) Explain the concept of destabilization of colloidal particles during coagulation. **[4]**

c) Explain the concept of tube & plate settler. **[4]**

Q3) a) What is demineralization? Explain any one process in detail. **[6]**

b) Explain detailed operation of filtration process in rapid sand filter with diagram. **[6]**

OR

b) Explain water softening process. Explain any one in detail. **[6]**

c) Explain forms of chlorination. **[4]**

P.T.O.

SECTION - II

Q4) Answer any three of following. **[3 × 6 = 18]**

a) Explain details of steel pipes with respect to strength, durability, leakage, laying, transportation, availability and advantages.

b) Mention necessity and types of reservoirs in detail.

c) Write a note on

i) Pumping mains

ii) Gravity mains

d) Explain the pressure testing process in detail.

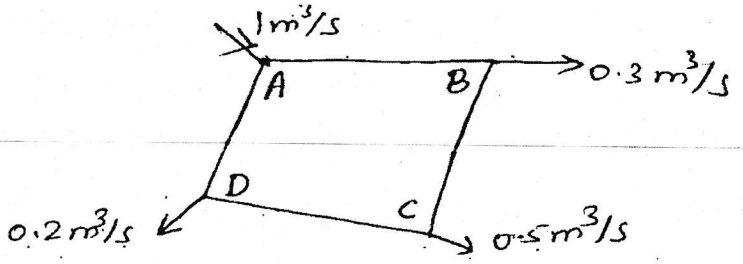
e) Explain factors considered for choice of pipe materials.

Q5) a) What are the various layout patterns of water distribution system? **[5]**

b) A pipe network consist of following pipes- **[8]**

Pipe	Length(m)	Dia(mm)	Friction factor
AB	400	300	0.014
BC	600	300	0.010
AD	500	400	0.012
DC	500	250	0.011

Inflow at A is 1 m3/s, while outflow at B,C and D are 0.3, 0.5 and 0.2 m3/s respectively. Find flow in pipes.



c) "Software plays a vital role in network analysis." Explain. **[3]**

Q6) a) Explain fire hydrants and water meter in detail. [6]

b) Explain the maintenance of water distribution system. [6]

OR

b) Write a note on green building materials. [6]

c) What is water budgeting? [4]

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Total No. of Pages : 3

Seat No.	

T.E. (Civil Engg.) (Part - II) (Semester - VI) (Revised) Examination, November - 2017
ENGINEERING MANAGEMENT
Sub. Code: 66875

Day and Date : Friday, 03 - 11 - 2017 **Total Marks : 100**

Time : 2.30 p.m. to 5.30 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to right indicates full marks.**
3) **Assume suitable data if necessary.**

SECTION - I

Q1) a) Enumerate principles of management given by Henry fayol and explain any three of them? **[8]**

OR

a) With suitable example explain decision tree? **[8]**

b) Four salesman are to be assigned to four district Estimates of sales revenue in thousands of rupees for each salesman is given below.

Assign salesman to the district. **[10]**

Salesman	District			
	A	B	C	D
01	32	35	40	28
02	40	25	30	22
03	42	27	34	30
04	25	39	41	35

P.T.O.

Q2) a) Enumerate types of organization? With neat organization structure diagram explain any one along with its advantages and disadvantages? **[8]**

OR

a) Define planning? Explain process and characteristic of planning? **[8]**

b) Calculate total cost of inventory & EOQ from following annual consumption of 36000 units, inventory carrying cost is 20%per annum with ordering cost 25 RS associated with one order & cost per item is 1 Rs? **[8]**

Q3) Write any two **[16]**

a) Derive derivation for EOQ formula.

b) State and describe importance of management in construction industry.

c) Explain ABC analysis concept with neat graph?

SECTION - II

Q4) a) Suggest which equipment should be purchased if rate of interest is 12% per year by using present worth method.

	Equipment A	Equipment B
Initial Cost (Rs)	Rs 25000/-	Rs 35000/-
Annual O & M cost (Rs)	Rs 9000/-	Rs 7000/-
Salvage value (Rs)	Rs 2000/-	Rs 3500/-
Life (in Years)	5	5

[12]

b) With suitable example explain the term equivalence. **[6]**

OR

b) With suitable example explain the term time value of money. **[6]**

Q5) a) Draw a typical layout for site of construction of multistoried building. **[5]**

OR

a) What do you know about child labour act? **[5]**

b) What are the factors considered for site layout? **[5]**

c) Write a detailed note on building and other construction workers act. **[6]**

Q6) Write Any 2 **[16]**

a) Write down procedure for value analysis?

b) Draw quality circle organization structure and explain benefits of quality circle?

c) With neat flow chart describe the procedure of work study?

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Total No. of Pages :3

Seat No.	

T.E. (Civil) (Semester - VI) (Revised) Examination, November - 2017
GEOTECHNICAL ENGINEERING - II
Sub. Code: 66874

Day and Date :Thursday, 02 - 11 - 2017 **Total Marks : 100**
Time :2.30 p.m. to 5.30 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Make assumptions wherever necessary.**
4) **Use of non-programmable calculator is allowed.**

SECTION-I

Q1) Solve any three from following. **[18]**

a) Explain bore hole logging with sketch for soil and rock exploration.

b) List engineering properties of rock. Explain any one with method for determination.

c) Explain elastic settlement of shallow foundation.

d) List types of bearing capacity failure of soil. Explain any one with sketch.

Q2) Solve any two from following. **[16]**

a) Explain standard penetration test for determination of bearing capacity.

b) A plate load test was carried out on a ground having uniform sand strata up to sufficient depth. The size of the plate used was 30cm×30cm. Determine the bearing capacity and load that can be taken by a column foundation of size 1.2 m× 1.2 m in the above strata for an allowable settlement of 2 cm.

Load(kN)	4.5	9	18	27	36	45	54
Settlement (mm)	0.75	1.25	2.0	3.5	5.38	7.75	10.75

P.T.O.

c) Write and explain equation of net ultimate bearing capacity of soil for general shear failure by IS code method with shape, depth, inclination of load and water table factor.

Q3) Solve any two from following. **[16]**

a) Explain stepwise procedure for design of strap foundation with required equations and sketch.

b) Design a trapezoidal combined foundation for following data:

Column	Size	Load	Remark
A	0.50×0.50 m	2000kN	Column A is on boundary of plot.C/c distance between columns is 5.0 m.Safe bearing capacity of soil is 200kN/m²
B	0.30×0.30m	1500kN	

c) A rectangular foundation of 6.0 mt × 4.0 mt size carries a uniform load intensity 160kN/sq.m and is located at a depth of 1.5 m in a layer of clay having $E=4\times10^4$kN/sq.m and Poisson's ratio as 0.38. This clay layer underlain by second layer of silty soil having $E=7\times10^4$kN/sq.m and Poisson's ratio as 0.48. A hard strata lies below the second layer. Determine the elastic immediate settlement of the foundation.

SECTION-II

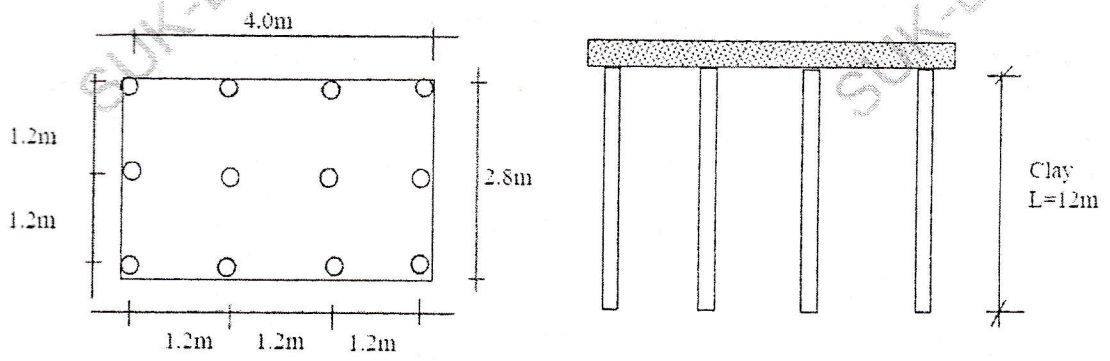
Q4) Solve any three from following: **[18]**

a) What is group efficiency of pile group? Explain Feld's rule.

b) Explain with neat sketch under reamed pile and their uses.

c) A rectangular pile of section 0.60 m ×0.75 m and length 12 m penetrates a deposit of clay with c=42 kN/m². Assuming m=0.75, determine the magnitude of negative skin friction.

d) Find the allowable bearing capacity of a single pile in the group of piles given below, by using: Converse-Labarre Formula. Given data:- Diameter: 400mm, Cu=50kPa, γ=18kN/m^3 F.S.=2.5



Q5) Solve any two from following: **[16]**

a) Describe the methods of rectifying the tilt in the well during sinking operation.

b) Explain with fig. sand island method.

c) Write the different types and material used for sheet pile.

Q6) Solve any two from following: **[16]**

a) Explain the friction circle method of slope stability analysis.

b) Name the techniques used in ground improvement and explain any one.

c) A slope 1 in 2 with a height of 8 m has the following properties of soil are Cu = 28 kN/m^2, angle of internal friction = 10° and unit weight of soil is 18 kN/m^3, Stability Number = 0.064. Calculate factor of safety with respect to cohesion. What will be critical height of the slope in this soil?

Seat No.	

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Total No. of Pages : 3

T.E. (Civil) (Semester-V) (Revised) Examination, May - 2017
GEOTECHNICAL ENGINEERING-I
Sub. Code : 66238

Day and Date : Thursday, 18-05-2017
Time : 10.00 a.m. to 1.00 p.m.

Total Marks : 100

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Make assumptions wherever necessary.**
4) **Use of non-programmable calculator is allowed.**

SECTION-I

Q1) Solve any three from following. **[18]**

a) Explain corrections applied to hydrometer reading in wet mechanical analysis.

b) List the methods for determination of Sp. Gravity of soil. Explain any one.

c) An undisturbed sample of clay brought from the field was noted to have a volume of 18 cc and weight of 30.8 gm. On oven drying the weight of the sample was reduced to 20.5 gm. The volume of dried sample as obtained by mercury replacement method was 12.5 gm. Calculate shrinkage limit and the Sp. Gravity of solids.

d) The minimum and maximum dry unit weights of sandy soil are 14.70 KN/cu mt and 18.60 KN/cu mt respectively. Find the dry unit weight and void ratio in natural state corresponding to 60% density index if Sp. Gravity of soil solids is 2.65.

Q2) a) Derive equation of seepage pressure in terms of coefficient of permeability, hydraulic head causing flow and flow net characteristics. **[8]**

OR

a) List laboratory methods for determination of coefficient of permeability explain in one with figure. **[8]**

b) Calculate the horizontal and vertical permabilities of a soil deposit consisting of three layers 150 cm, 180 cm, 200, thick with permabilities 10^{-5}, 10^{-7}, 10^{-9} m/s respectively. **[8]**

P.T.O.

Q3) a) List field compaction control methods and explain any one. **[8]**

OR

a) Explain i) Zero air void line or curve **[8]**

ii) Pre Consolidation pressure

b) A soil sample 20 mm thick take 20 minutes to reach 20% consolidation. Find the time taken for a clay 6 mt thick to reach 40% consolidation. Double drainage was in both the cases. **[8]**

SECTION-II

Q4) Solve any three from following. **[18]**

a) Derive an expression for Boussinesq's equation for vertical stress due to point load.

b) Explain Westerguards theory in brief.

c) A concentrated load of 300 kN is applied at the ground surface. Determine the vertical stress at a point Q which is 6 m directly below it. Also compute the vertical stress at appoint R which is at depth 6 m but at a horizontal distance of 5 m from the load axis. Use Boussinesq's equation.

d) Prove that stresses below the point load as calculated by Westerguards and Boussinesq's theory are in the ration of 1:1.5 approximately.

Q5) Solve any two from following. **[16]**

a) Explain different drainage conditions for determination of shear strength parameters.

b) Direct shear test conducted on a dry, sandy soil. The size of the specimen was 60 mm x 60mm x 25 mm. Tests result were as given in the following table:

Test No.	Normal force (N)	Shear force at failure (N)
1	90	54
2	135	82
3	315	189
4	450	270

Find shear strength parameters.

c) The results obtained from a series of CU tests on a soil gave the following results:

$c_{CU} = c'_{CU} = 0$ and $\Phi_{CU} = 15°$; $\Phi'_{CU} = 30°$

A sample of this soil was tested in a CU test under cell pressure of 150 kN/m^2. Determine

i) Deviator stress at failure

ii) Pore water pressure at failure

Q6) Solve any two from following. **[16]**

a) Explain earth pressure at rest, active earth pressure and passive earth pressure with neat fig.

b) An unsupported excavation is to be made in a clay layer. If $\gamma = 18$ kN/m^3, c = 18kN/m^2 and □ = 10°. Calculate the depth of tension cracks and calculate the maxi. possible unsupported depth.

c) A smooth retaining wall 6 m high retains dry granular backfill weighing 16 kN/m^3 to its level surface. The active thrust on the wall is 96 kN/m of the wall. What will be the total active thrust if the water table comes upto backfill surface? Take specific gravity of backfill = 2.65.

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Total No. of Pages :3

Seat No.	

T.E. (Civil) (Semester - VI) (Revised) Examination, November - 2017
THEORY OF STRUCTURES
Sub. Code: 66873

Day and Date :Wednesday, 01 - 11 - 2017 **Total Marks : 100**
Time :2.30 p.m. to 5.30 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of non-programmable calculator is allowed.**
4) **Assume suitable data if necessary.**

SECTION-I

Q1) a) Explain in brief 'Static Indeterminacy of Structures'. **[5]**

b) Analyze the propped cantilever beam AB of 5m span, fixed at A and propped at B when subjected to a point load of 5kN at 3m from left end A. Take fixed end moment 'M_A' as a redundant. Also draw SFD and BMD. **[12]**

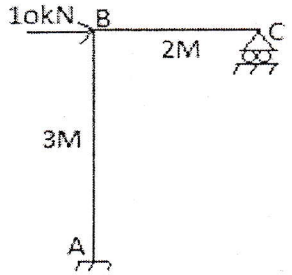
OR

A fixed beam AB 5m in span is subjected to a point load 5kN at 3m from left end A. Analyze the beam by taking 'R_B' and 'M_B' as redundants. Draw SFD and BMD.

Q2) a) Explain 'Unit load Method' to find slope and deflections in structural members. **[5]**

P.T.O.

b) The bent ABC is subjected to lateral load of 10kN as shown in the fig.1 below. Determine the reactions at support C by strain energy method. Draw SFD and BMD **[12]**



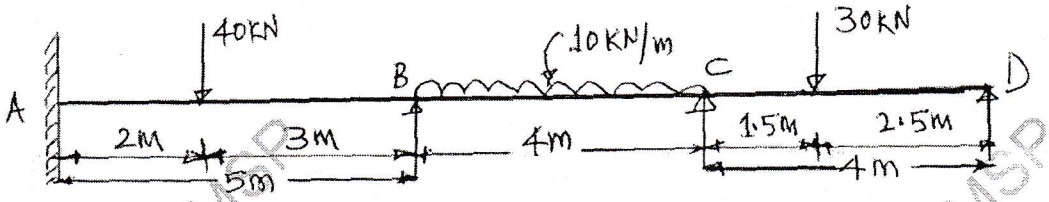
(FIG.1)

Q3) A continuous beam ABCD is fixed at A and simply supported at B and C with CD as a overhang wherein AB=4m BC=3m and CD=2m. The span AB is subjected to a udl of 10kN/m throughout, span BC to a point load of 25kN at its midpoint and point D is acted upon by a clockwise couple of 50kNm. During loading support C settles by 5mm. Draw SFD and BMD. Take $EI_{BC} = 2\times10\text{^}4kN/m\text{^}2$. $EI_{AB} = 2EI_{BC}$. **[16]**

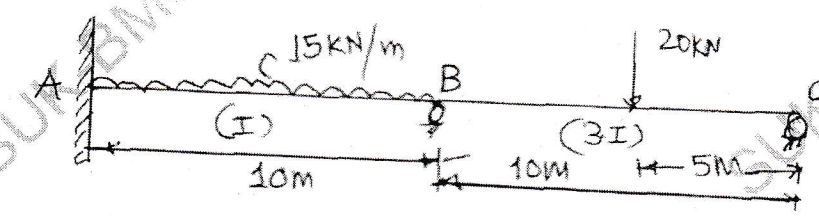
SECTION-II

Q4) A two span continuous beam ABC has span AB of 6 m and Span BC of 4 m. End A is fixed while end C of the beam is simply supported. Span AB carries through u.d.l of 20 KN/m and BC carries central point load 40kN.Span AB has its inertia double that of span BC. Analyse the beam using slope deflection method. Draw SFD and BMD. **[17]**

Q5) Analysis the continuous beam loaded as shown in fig.by method of moment Distribution method. Sketch the BMD and SFD. **[17]**

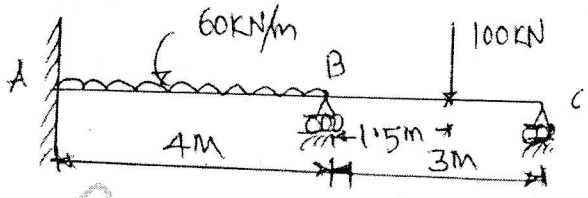


Q6) Analysis the two span continuous beam as shown in fig. by stiffness matrix method. Also draw BMD. **[16]**



OR

Analysis the continuous beam as shown in fig.by flexibility matrix method. Take EI constant throughout. **[16]**



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Total No. of Pages : 3

Seat No.	

T.E. (Civil) (Semester-V) (Revised) Examination, November - 2017
WATER RESOURCES ENGINEERING - I
Sub. Code : 66235

Day and Date : Thursday, 09-11-2017 **Total Marks : 100**

Time : 10.0 a.m. to 1.00 p.m.

Instructions :
1) **Que. 1 and 5 are Compulsory. Attempt any two questions from remaining questions from both sections.**
2) **Assume any suitable data if necessary, wherever needed.**
3) **Figures to the right indicate full marks.**

SECTION-I

Q1) a) Explain infiltration capacity of the soil with help of a graph. Explain the effects of infiltration. **[6]**

b) Describe the procedure to construct unit hydrograph from storm hydrograph. **[6]**

c) Explain how discharge of the water stream is measured? Explain any one method in detail. **[6]**

Q2) a) Exnlist different methods of assessment of average precipitation. Explain any one method in detail with a neat sketch. **[8]**

b) Define evaporation process. Describe the factors affecting evaporation and also the measures to reduce it. **[8]**

Q3) a) Define unit hydrograph. List the assumptions and limitations involved in unit hydrograph theory. **[8]**

b) Given below are the ordinates of 4 hour unit hydrograph. Derive and plot 16 hour unit hydrograph. Describe the procedure in detail. **[8]**

Time(hours)	0	4	8	12	16	20	24	28	32	36	40
Observed flow(m^3)	0	16	58	89	145	80	55	36	16	8	0

P.T.O.

Q4) Write detailed notes on: **[16]**

a) Abstract losses from precipitation

b) Factors affecting runoff

c) Site selection criteria for discharge measurement of river.

d) Flood frequency analysis

SECTION-II

Q5) a) Define porosity, specific yield and specific retention and obtain relation between them. **[6]**

b) The base period, intensity of irrigation and duty of water for various crops under a canal system are given below. Determine the reservoir capacity if culturable commanded area is 40000 hectors, canal losses are 20% and reservoir losses are 10%. **[6]**

Crop	Base period (Days)	Duty of water at the field (Hectors/ cumec)	Intensity of irrigation (Percentage)
Cotton	180	1400	10
Sugar cane	360	1700	20
Wheat	120	1800	20
Rice	120	800	15
Vegetables	120	700	15

c) Explain Bandhara irrigation scheme in detail. **[6]**

Q6) a) Derive an expression for discharge from a well in unconfined aquifer the well fully penetrates it. **[8]**

b) Briefly explain role of ground water in water resources development of country. **[8]**

Q7) a) Explain in detail following: **[6]**

i) Intensity of irrigation

ii) Kor watering

iii) Kor depth

iv) Kor period

v) Crop ratio

vi) Overlap allowance

b) Explain estimation of evapo-transpiration by penman method. **[5]**

c) Discuss in brief water logging and land drainage. **[5]**

Q8) a) Explain need and importance of water shed management. **[8]**

b) Explain with neat sketch the layout, main components and working of percolation tanks also explain its advantages and disadvantages. **[8]**