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B.Tech. Civil - sem VII
Advanced surveying.

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

GOVERNMENT AIDED AUTONOMOUS INSTITUTE
ANDHERI (WEST), MUMBAI - 400 058.

End Semester Exam
Nov – Dec 2015

Max. Marks: 100 **Duration: 03 hours**

Class: **B.Tech. (Civil)** Semester: **VII**

Name of the Course: **Elective I – Advanced Surveying** Program:

Course Code: **CE411**

Instructions:

1. **Attempt any five questions out of seven.**
2. **Question No 1 is compulsory.**
3. **Provide answers with neat sketches, diagrams and figures, wherever applicable**
4. **Assume suitable data if required and state it in the answer sheet**
5. **Answers to all sub-questions should be grouped together**

Master file.

Q.1 **a** Answer any four:

List out the advantages and disadvantages of a total station	**05**
Explain 'intentional degradation of GPS satellite signal'.	**05**
Compare remote sensing and photogrammetry	**05**
List out the advantages and disadvantages of various remote sensing platforms	**05**
Explain the Right Ascension and Declination System with neat sketch	**05**
Explain clearly the method of determining the levels of points on a river bed.	**05**

Q.2 **a** Explain the procedure of measuring the levels and horizontal distance by a digital level using a bar code rode **08**

b A study area is 10km wide in the east west direction and 16km long in the north south direction. A camera having a 152.4mm focal length lens and a 230mm format is to be used. The desired photo-scale is 1:25000 and the nominal end-lap and side-lap are to be 60 and 30 percent respectively. Beginning and ending flight lines are exactly on the boundaries of the study area. The only map available for the area is at a scale of 1:62500 indicating the average terrain elevation of 300m above datum. Perform the computations necessary for developing a flight plan and draw the flight plan. **12**

Q.3 **a** Explain the principle of an automatic level. Describe the procedure of measuring horizontal angle with an optical theodolite **12**

b With a neat sketch explain the relative or differential positioning method of GPS. **08**

Q.4 **a** Define parallax and explain with neat sketch the method of obtaining height of any point or object or feature on the ground surface using the parallax measurements. **08**

b A near- polar satellite is orbiting at a height of 832 km. It covers a swath width of 60 km and has spatial resolution of 10m. Average radius of earth may be taken as 6380 km. Find IFOV, swath angle, ground track speed of the satellite, no. of pixels per scan line, no. of orbits per day, no. of days required to cover the globe. **12**

B Tech. Civil - Sem VII

Advanced Surveying Dt. 26/11/15

Q.5 **a** Find the shortest distance between two places P and Q, if their latitude and longitude are as follows:

Place	Latitude	Longitude
P	$19^0\,20'$ N	$51^0\,37'$ E
Q	17^0 N	$56^0\,34'$ E

Also, find the direction of line PQ on the great circle. Take radius of earth as 6370km **08**

b Explain with neat sketch the procedure to determine any location using GPS receiver. Explain the control segment of a GPS **12**

Q.6 **a** During a hydrographic survey at the sea, the soundings were located by observing three shore stations P, Q and R, having coordinates (meters) of 0-0, 500N-1000E, and 250N-1500E respectively. Calculate the distance OP, OQ and OR. **12**

b Explain whisk-broom scanning with a neat sketch. Give two examples of such sensors **08**

Q.7 **a** Define (any two): **04**
1. Global Hour Angle, 2. Zenith angle, 3. Declination, 4. Altitude, 5. Latitude

b Estimate the azimuth of the sun having declination of $6°12'S$ at Mumbai having latitude $18°58'30"$ at sunrise. **06**

c Explain the three point problem in hydrographic surveying and with neat sketch describe any one graphical method to solve the three point problem **10**

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Duration: 4 hour

Marks: 100

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SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar,Andheri(West),Mumbai 400 058

(A Government Aided Autonomous Institute)

END SEM RE-EXAM

Subject: **Building Design and Drawing**
Class/Branch: **CIVIL**

Course code: **CE303**
Semester: VII

Note: Final Year B.Tech civil sem VII Building Design & Drawing dt. 6.1.16

- Q.1 is compulsory.
- Attempt any **four** out of remaining **six** questions
- Assume suitable data if required and state it in the answer sheet.
- Answer the theory questions in the answer sheet and drawing questions on drawing sheet
- Draw or answer each question on a new sheet or page
- Figures to right indicate full marks.

MasterFile

Q.1 It is proposed to construct a (G+1) RCC primary school for standards first to fourth having three divisions of each standard with 45 students in each division at district level.

a Design and develop the ground floor line plan. Provide entrance, stairs, corridors, passages and sanitary units as per the byelaws and standards. **15**

b State the byelaws and principles you have followed while planning the school building **05**

Q.2 **a** Draw the site plan of the building you have planned in Q.1. **05**

b Explain in detail how you have calculated the number of sanitary units for males and females for the school building you have designed in Q.1. And draw a detailed plan of the typical male sanitary unit that you have designed for the school building in Q .1 showing the unit arrangement and their sizes. **10**

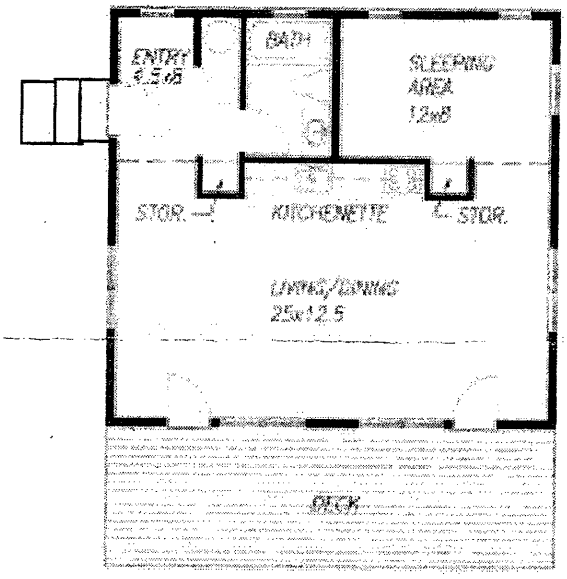
b State the objectives of building bye-law **05**

Q.3 **a** Draw the foundation plan for the structure you have planned in Q.1 along with a detailed section of the foundation you have provided. **12**

b Explain the importance of the foundation plan during the execution of a project and enlist the essentials to be shown in the foundation plan. **08**

Q.4 **a** Distinguish between one points, two point and three point perspective with neat sketches. **08**

b Draw the two point perspective of the residential building as shown in Fig.1. The observer is at distance of 5.5m along the central visual ray and the height of the observer's eye level is 2m. Draw the plan to a scale of 1:50. Assume suitable dimensions wherever necessary and state it. **12**



Plinth height: 0.60m above G.L,

Deck height: 0.45m above G.L

Floor to ceiling height: 3.5m

Window sill height: 1m above floor level

Q.5 **a** Draw a detailed plan showing all the interior details of the administrative office of your college. **15**

b State the general principles followed for planning anoffice building **05**

Q.6 **a** State the advantage and disadvantage of green building. **05**

b Draw the sectional elevation for the building you have planned in Q.1 and show all the necessary details. **15**

Q.7 **a** Draw the longitudinal and cross section showing the typical reinforcement details of a simply supported RCC 'T' beam **10**

b Write a short note on concentric and ribbon growth of town. **10**

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Re-Examination

January 2016

Final Yr. B.Tech (Civil) Sem VII

Max. Marks:100 Duration: 3 hours

Class: B. Tech Semester: VII Program: Civil Engineering

Name of the Course: Irrigation Engineering Course Code : CE403

Irrigation Engg. dt. 6.1.16.

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

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Question No			Maximum Marks
Q1	(a)	Explain command area development in detail	5
	(b)	Explain the following terms: (i) Base period (ii) Crop Period (iii) Kor Period (iv) Crop rotation (v) Intensity of irrigation.	10
	(c)	Name principle rabi and kharif crop and details the agriculture and climatic requirements for sowing, growth and harvesting of any two	5
Q2	(a)	Define precipitation and various types of precipitation with diagram.	10
	(b)	Compare flooding, furrow, sprinkler and drip irrigation method.	10
Q3	(a)	Explains various methods of estimation of missing rainfall. The normal rainfall at station A, B, C and D over a basin are 88.9, 75.77, 85.2 and 120.4 cm respectively. In a particular year the station D was inoperated and the station A, B and C recorded annual precipitation of 90.64, 85.36 and 79 cm respectively. Find the missing rainfall value at station D for that year.	8
	(b)	Explain various factors affecting duty and delta.	6
	(c)	Explain recuperation test for open well.	6
Q4	(a)	Discuss various factors affecting runoff.	5
	(b)	Explain the following terms: (i) Aquifer (ii) Aquiculde (iii) Aquifuge (iv) Aquitard (v) Perched Aquifer (vi) Specific yield (vii) Specific retention (vii) Mass Curve (ix) Hydrograph (x) Double Mass Cuve	10
	(c)	Write short note on water logging.	5

Q5 (a) Explain unit Hydrograph. Determine the ordinate of 12-hr UH form given 4-hr UH. 10

Time (h)	0	4	8	12	16	20	24
Ordinate of 3-h UH (m^3/sec)	0	8	20	15	10	4	0

(b) Discuss various forces acting on gravity dam in detail. 10

Q6 (a) Discuss in brief various investigation required for reservoir planning. 10

(b) Write short note on arch and butters dam. 5

(c) Sketch a ogee spillway and explain the function of its various component part. 5

Q7 (a) A pumping test was made in medium sand and gravel to a depth of 15 m where a bed of clay was encountered. The normal ground water level was at surface. Observation holes were located at a distance 3 m and 7.5 m from the pumping well. At a discharge of 3.6 lit/sec from the pumping well, a steady state was attained in about 25 hours. The drawdown at 3 m was 1.65 m and at 7.5 m was 0.36 m. compute the coefficient of permeability. 5

(b) Discuss in detail the design procedure for canal design using Lacey's theory and also explain importance of canal lining. 10

(c) Explain seepage control measures in case of earthen dam. 5

B.Tech - Sem VII
Limit state method of RC structures.

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Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam
November 2015

Max. Marks: 100 Duration: 03 Hrs
Class: B.Tech Semester: VII Programme: Civil
Name of the Course: Limit state method of RC structures Course Code :

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six. master file.
3. Draw neat diagrams
4. Assume suitable data if necessary

Question No		Maximum Marks
Q1(a)	How much minimum and maximum reinforcement is provided in RC column section? What is the purpose of column ties?	(04)
(b)	Explain under reinforced, balanced and over reinforced RC section for Limit state method of design.	(06)
(c)	A singly reinforced concrete beam of section 230 mm x 600 mm effective depth is reinforced with 4-16 dia bars. Calculate ultimate moment of resistance of section. Use **Ultimate load method**. f_{ck}= 200 kg/cm^2 and f_y= 2600 kg/cm^2	(10)
Q2(a)	Design a doubly reinforced section of dimension 300mm x 500 mm total depth with effective cover for compression and tension steel as 50 mm subjected to ultimate design moment 225 Kn-m. Assume grade of concrete M20 and grade of steel Fe415.	(12)

Table for *Fsc*

Grade of steel	d_c/d			
	0.05	0.1	0.15	0.2
Fe 415	355.1	351.9	342.4	329.2

(b)	Design a short circular column of effective length 3.2 m subjected to an axial force of 1650 Kn. Grade of concrete M25, Grade of steel Fe 415. Draw reinforcement details	(08)
Q3(a)	Explain with neat sketches concept of equivalent depth of flange y_f in case of flanged section	(04)

B.Tech. Sem VII Limit state method of RC Structures.

(b) Calculate MR for flanged RC section for given data (16)

Dt. 16/11/15

b_f = 850 mm D_f = 90 mm d_{eff} = 500 mm b_w = 250 mm. Ast = 2300 mm^2 Grade of concrete M20 , Grade of steel Fe 415.

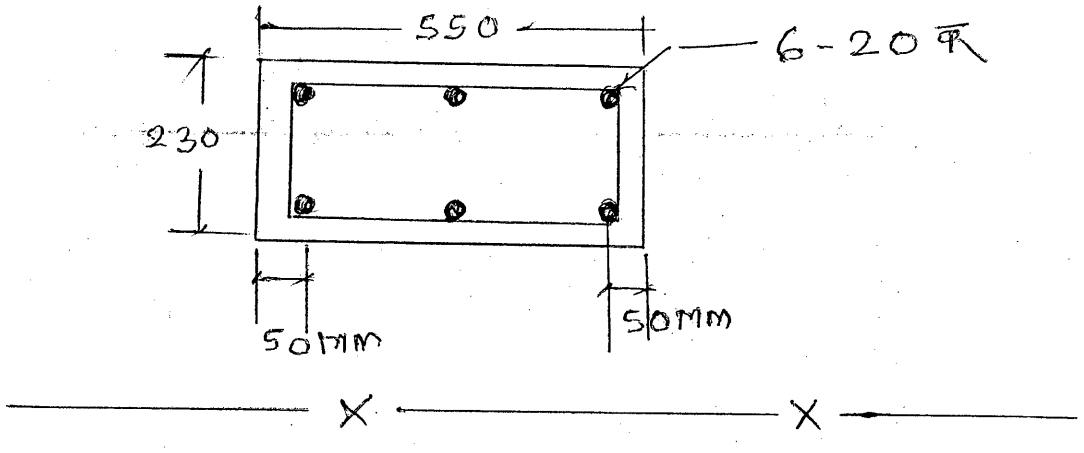
Q4 A reinforced concrete beam 300 mm wide and 550mm depth is subjected to factored BM of 120 Kn-m, factored torsional moment of 25 Kn-m and factored shear force of 115 Kn , design flexural as well as shear reinforcement for the beam. Grade of steel Fe 415. Grade of concrete M20. (20)

Q5 Design combined pad type footing for following data, Column C_1 400mm x 400mm with 8- 16 dia bars is subjected to an axial load of 1100 Kn,(service load) Column C_2 450mm x 450mm with 8- 20 dia bars is subjected to an axial load of 1450 Kn,(service load). Column C_1 is on property line and centre to centre distance between columns is 3.5 M. S.B.C. of soil 220 KN/m^2. Grade of concrete for column and footing is M 20. Grade of steel Fe 415. Draw reinforcement details in section and in plan. (20)

Q6(a) Design an isolated square flat footing for 350 mm x 350 mm column with 4- 20 dia reinforcement, subjected to service axial load of 1050 KN. S.B.C. of soil 160 KN/m2. Grade of concrete for column M 25 and for footing M 20. Grade of steel Fe 415. Draw Reinforcement details (12)

(b) Design one way slab of c/c span of 3.25 M resting on 230 mm thk brick masonry . Slab is subjected to live load of 3.0 Kn/m^2 and floor load of 1.0 Kn/m^2 in addition to its self weight. Grade of concrete M20 and steel Fe 415. Draw reinforcement detail with neat sketch. (08)

Q7 Calculate ultimate capacity of column section 250 x 600 mm shown below in axial compression and uni-axial bending if x_u / D=1.1 (along depth). M20 concrete grade, Grade of steel Fe 415. (20)



B. Tech. Sem VII

Limit state method of RC structures. Dt. 16/11/15

Table 19 Design Shear Strength of Concrete, τ_c, N/mm²

(Clauses 40.2.1, 40.2.2, 40.3, 40.4, 40.5.3, 41.3.2, 41.3.3 and 41.4.3)

$100\frac{A_s}{bd}$	Concrete Grade					
	M 15	M 20	M 25	M 30	M 35	M 40 and above
(1)	(2)	(3)	(4)	(5)	(6)	(7)
≤ 0.15	0.28	0.28	0.29	0.29	0.29	0.30
0.25	0.35	0.36	0.36	0.37	0.37	0.38
0.50	0.46	0.48	0.49	0.50	0.50	0.51
0.75	0.54	0.56	0.57	0.59	0.59	0.60
1.00	0.60	0.62	0.64	0.66	0.67	0.68
1.25	0.64	0.67	0.70	0.71	0.73	0.74
1.50	0.68	0.72	0.74	0.76	0.78	0.79
1.75	0.71	0.75	0.78	0.80	0.82	0.84
2.00	0.71	0.79	0.82	0.84	0.86	0.88
2.25	0.71	0.81	0.85	0.88	0.90	0.92
2.50	0.71	0.82	0.88	0.91	0.93	0.95
2.75	0.71	0.82	0.90	0.94	0.96	0.98
3.00 and above	0.71	0.82	0.92	0.96	0.99	1.01

NOTE — The term A_s is the area of longitudinal tension reinforcement which continues at least one effective depth beyond the section being considered except at support where the full area of tension reinforcement may be used provided the detailing conforms to 26.2.2.

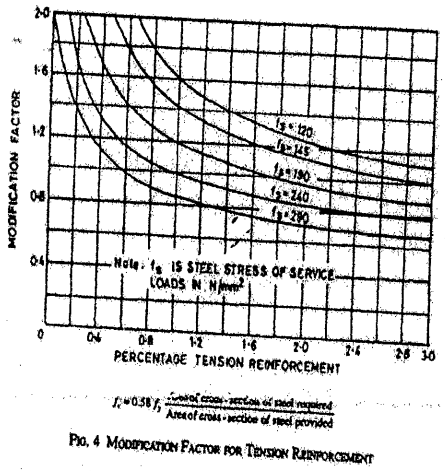


FIG. 4 MODIFICATION FACTOR FOR TENSION REINFORCEMENT

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Table 3.2 Design stresses at specifie

Fe 415	
Strain	Stress (MPa)
0.000 00	0.0
0.001 44	288.7
0.001 63	306.7
0.001 92	324.8
0.002 41	342.8
0.002 76	351.8
≥0.003 80	360.9

Design Stress at specified strain value

B.Tech. Civil - Sem VII
Construction Engg - Date. 18/11/15

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End Semester Exam
Nov – Dec 2015

Max. Marks: 100 | **Duration: 3hours**

Class: B.Tech Civil | Semester: VII

Name of the Course: Construction Engineering | Program: Civil Engineering

Course Code: CE402

Instructions:

1. **Attempt any five questions out of seven.**
2. **Draw neat diagrams**
3. **Assume suitable data if necessary**

Master file.

Q1	(a)	Give advantages and disadvantages of using large trucks compared to small.	5
	(b)	Discuss the factor to be considered for selection of construction equipment	5
	(c)	Explain the method of dust prevention during construction of tunnelling	5
	(d)	Justify the conditions when you will rent an equipment as against purchasing it.	5
Q2	(a)	Explain in detail following equipment. a) dragline b) dozer	10
	(b)	A large concrete road project involves preparation and placement of 6, 60,000 cum of concrete in a calendar period of 5 years. The maximum quantity of concrete to be placed is during the second year of about 2, 50,000 cum. It is proposed to work 2 shifts per day each shift of 6 hours and 300days in a year to complete the project. Work out the number of 5.5cum concrete mixer required for producing requisite quantity of concrete.	5
	(c)	Explain the factors affecting rolling resistance of equipment	5
Q3	(a)	Explain the following terms. a)Safety fuse b)Stemming c) Charging d) Misfire e)drill pattern	5
	(b)	Explain how crushers are classified and describe the working of a gyratory crusher with a neat sketch	10
	(c)	Discuss the classification of crane and describe gantry crane with a neat sketch	5

B.Tech. civil - Sem VII
Construction Engg. Date. 18/11/15

Q4 (a)	Explain in detail needle beam method of tunnelling with a neat sketch.	5
(b)	Write a note on TBM	5
(c)	Discuss grass hopper method of mucking in tunnel	5
(d)	What are geo-synthetics? Discuss their application in construction.	5
Q5 (a)	Differentiate between top feed and bottom feed technique of constructing stone columns use sketches	5
(b)	What is a diaphragm wall? State it suitability, advantages and disadvantages.	5
(c)	A truck will be loaded by a 0.75 cum hydraulic hoe excavating common earth with no delay for hauling units having a cycle time of 25seconds. The time for travel of 7min remain same for both the sizes of truck. (3cum and 11.5cum). Select proper hauling unit for the hoe depending on the operating efficiency of truck and hoe.	10
Q6 (a)	Write a short note on a) Vacuum concreting b) Drum Mixer c) needle vibrators d) Jump form	20
Q7 (a)	Enlist different types of cladding and explain Glass cladding and timber cladding in detail.	10
(b)	A shovel with a 2cy heaped capacity bucket is loading shale on a bridge project. The average face height is expected to be is 20ft. The shovel has a maximum rated digging height of 36ft. The angle of swing is 90degree.Determine the ideal production of shovel and also determine the downtime cost of shovel down for 5%, 7% and 9% of the time in first three years of use. the operating cost of shovel is Rs.1800/hr it works for 2000 hours a year with a productivity factor of 0.87	10

(2)

B.Tech. Civil - Sem VII
Construction Engg. Date. 18/11/15

Table1.1: Bucket Fill Factor (% rated capacity)

Material	**Bucket fill factor (%)**
Sand & gravel	90-100
Common Earth	80-90
Shale	65-75
Wet Clay	50-60
Rock well blasted	60-75
Rock poorly Blasted	40-50

Table1.2: Correction factor for the effect of depth and angle of swing on power shovel.

Depth of cut (% of optimum)	**Angle of swing**			
	60°	75°	90°	120°
60	1.03	0.96	0.91	0.81
80	1.12	1.04	0.98	0.86
100	1.16	1.07	1.00	0.88
120	1.11	1.03	0.97	0.86
140	1.04	0.97	0.91	0.81

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B.Tech. (civil) Sem VII
Advanced computational Technologies.

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SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar,Andheri(West),Mumbai 400 058

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END SEMESTER

Nov-Dec 2015

Duration: 3 hours Marks: 100

Class/Branch: B.Tech (Civil) Semester: VII

Name of the Course: Advanced Computational Technologies Programme: Civil Engineering

Course Code: CE408

Note:

- Attempt any five questions.
- Assume suitable data if required.
- Distribution tables are allowed.
- Answers to all sub-questions should be grouped together.

Master file.

Q.1. Solve following questions,

(A) Spectrum light bulb company went for mass production of colour bulbs before Diwali festival. Five bulbs, one of each colour, were packed in each of the boxes which were to be sold as unit item to the customers. Due to shortage of time, quality was compromised & it was estimated that 20 % of the bulbs are defective. If the customers purchase such a box of bulbs that the box will have i) No defective bulbs ii) Two defective bulbs iii) at least one defective bulb iv) At most one defective bulb v) All defective bulb **(05)**

(B) In a sample of 1000 tube lights, the mean life & Std.deviation of lives are 4500 hrs. & 1500 hrs respectively. Assuming the distribution to be normal, find the number of tubes lasting between 4000 hrs & 6000 hrs. **(05)**

(C) The avg. number of customers, arriving at bank's counter per minute is 2. Find the probability that during a given minute;

i) No customer arrives ii) three or more customers arrive. **(05)**

(D) The scores obtained by students of a class follow a uniform distribution with 100 as maximum and minimum 60. Find the mean score & standard deviation of scores. If the passing score is set at 70, what percentage of students will pass the examinations? **(05)**

Q.2. Solve following questions,

(A) Define & necessity of Sampling. Explain any two methods of Probability Sampling & Non-Probability sampling. **(06)**

(B) A sample size of 10 drawn from a normal population has mean as 31 & variances as 2.25. Is it reasonable to assume that the mean of population is 30? Assume alpha= 0.01. Discuss

with parametric test for hypothesis. **(04)**

(C) The number of breakdown of machines in a big factory was found as 20,17,12,6,7,15,8,5,16 and 14 during the last 10 months period. Test whether these frequencies are in agreement with the belief that occurrence of breakdowns was the same during the 10 months period. Discus with parametric test for hypothesis. (Show critical region in distribution diagram) **(05)**

(D) Let A & B be two agriculture regions. The data below presents the yield, in quintals of 10 plots (of equal area) from each of the two regions, Let us now test whether the below random samples taken from two regions have the same variance at 5 % level of significance. **(05)**

Region A	12	7	15	10	13	8	7	10	10	8
Region B	10	9	6	7	8	7	10	15	12	9

Q.3. Solve following questions,

(A) What do you mean by Hypothesis testing? Explain with its types. **(02)**

(B)You have just taken pizza shop. Previous owner told you that you would save money if you bought mozzerela cheese in a 4.5 pound slab. Each time you purchase a slab of cheese, you weigh it to ensure that you are receiving 72 ounces of cheese. The results of 7 random measurements are 70, 69, 73, 68, 71, 69 & 71 ounces. Are these differences due to chance or is distributor giving you less cheese than you deserve? State the hypothesis & would the null hypothesis rejected at the 10%, 5% & 1% level. (1 pound= 16 ounces) **(08)**

(C) What do you mean by ANOVA? **(02)**

(D) Suppose Company wants to examine the safety of their three cars Honda city , Hundai accord & Corrolla cars. it collects samples of 3 for each car types. Using the hypothetical data provided below test whether the mean loads applied to bonnet during a load test is equal for each type of car. **(08)**

	Honda City	Hundai Accord	Corrolla
	643	469	484
	655	427	456
	702	525	402
$\bar{x}$	666.67	473.67	447.33
S	31.18	49.17	41.68

Q.4. Solve following questions,

(A) Formulation of Duality Theorem and its Characteristics. **(05)**

(B) A Laxmi Furniture Mart is in the Business of manufacturing Tables and Chairs. Over the years they are specialised in their art and technique of manufacturing of these two items. The task of Laxmi furniture mart is to assemble the Table and Chair from purchased part and finish the furniture for sale.

Manufacturing of table required 4 hours for assembling and 2 hours for finishing work whereas manufacturing of chair required 2 hours for assembling and 4 hours for finishing work, the

probability analysis indicates that one table contribute to 180 Rs. Profit whereas one chair contribute 155 Rs. Profit. Formulate the LPP and solve by graphical method. **(05)**

(C) Maximise, $Z_{max} = X_1 + 2X_2 + X_3$ **(10)**

Subjected to,

$2X_1 + X_2 - X_3 \leq 2$

$-2X_1 + X_2 - 5X_3 \geq -6$

$4X_1 + X_2 + X_3 \leq 2$

For all $X \geq 0$

Q.5. Solve following questions,

(A) Discuss Transportation Model for Optimization. **(05)**

(B) Discuss with an Example Balanced and Unbalanced Transportation Problem. **(05)**

(C) Total supply and Demand from various sources to various Destination and corresponding unit Transportation cost of the commodity is given in the following table. Calculate the initial feasible solution for Transportation problem by (a) N-W Corner Method (b) Least Cost method. **(10)**

Source/destination	1	2	3	4	Supply
1	2	3	4	5	6
2	5	4	3	1	8
3	1	3	3	2	10
Demand	4	6	8	6	

Q.6. Solve following questions,

(A) An investment company has to decide among the following options to invest Rs. 10 Crores.

1. Financing a mall which would have full- fledged entertainment as well as shopping experiences. This venture has high risk and could result in either a major loss or substantial gain within a year. The company estimates that with probability 0.4, it will lose all of the money. However, with probability 0.6, it will make a profit of Rs. 5 Crores.
2. The company can invest in the housing complex being built up in the city. Within a year, these would generate a profit of Rs. 2 Crores or loss of Rs. 1 Crore with the probabilities 0.7 & 0.3 respectively.
3. The company can invest in some fixed deposits that have a current yield of 9% per annum.
4. The company can also invest same amount in some mutual funds which could fetch dividend of 30% with probability 0.6 or may not fetch any dividend with probability 0.4.

a) Construct a decision tree to help the company decide how to invest its money? **(05)**

b) Which Investment would maximize profit? **(05)**

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Advanced Computational Technologies.

(B) Healthkart store desires to determine the optimal daily order size for a Whey Protein box. The store purchased whey protein box from bulk market at the rate Of Rs. 150 per kg & sells at the rate of Rs. 190 per kg in retail market. If the good environment creates, order size more than demand, the store can sell excess quantity at rate of Rs.140 per kg via online market; otherwise the opportunity cost for store is Rs. 20 per kg for unsellable portion of demand Based on feedback analysis given by customers, store came to know that the demand varies from 100 kg to 500 kg in steps of 100 kg. The possible values of the order size 150 kg to 600 kg in steps of 150 kg. Determine the optimal option by Laplace , Minimax , savage minimax regret & Hurwicz Criterion methods. **(10)**

Q.7. Solve following questions,

(A) What do understand by Genetic Algorithm? **(02)**

Explain stages involved in Genetic Algorithm analysis. **(06)**

Also state applications of GAs in Civil Engineering problems. **(02)**

(B) i) Define: Correlation & Regression analysis. **(02)**

ii) The following table gives the data for electricity supplied to industries & agriculture and the demand for electric motors in a certain region of a country for six years. Find the relationship between electric supply & demand for electric motors. Also find demand for electric motor when availability of electricity to industry & agriculture is 50 MW. **(04)**

Electricity supply (MW)	**Demand for Electric Motor (Thousands H.P)**
20	16
25	20
31	24
37	30
42	35
43	37

B.Tech. Civil - Sem VII Dt. 26/11/15
Advanced computational Technologies.

iii) The churn in the market capitalization of 17 companies during the years 2005 & 2006 was reported in Times of India, As follows. Find out Spearman's Rank Correlation Coef. (04)

Sr. No.	Company	Market Capital (Rs. in Crores) In 2005	Market Capital (Rs. in Crores) In 2006
1	RIL	108011	162971
2	ONGC	146835	161536
3	INFOSYS	123565	112180
4	NTPC	165723	90159
5	TCS	635246	61628
6	BHARATI	45697	112321
7	WIPRO	34612	53585
8	ITC	32794	54892
9	INDIAN OIL	59876	171231
10	ICICI BANK	65492	23789
11	BHEL	32794	48658
12	SBI	20135	39785
13	HLL	45619	47894
14	HDFC	42987	35489
15	L & T	126481	48658
16	Tata Motors	42354	12130
17	SAIL	37891	23879

(5)

B.Tech. Civil - Sem VII
Advanced structural Analysis.

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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam
November 2015

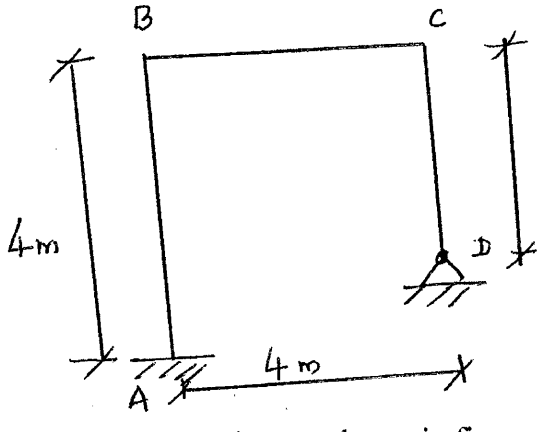
Max. Marks: 100 | Duration: 3 Hours
Class: B.Tech Civil | Semester: VII | Program: Civil Engineering
Name of the Course: Advanced Structural Analysis | Course Code : CE 407

Instructions:

1 Attempt any Five questions out of Seven questions
2. Answers to all sub questions should be grouped together.
3. Figures to the right indicate full marks.
4. Assume suitable data and state the same clearly

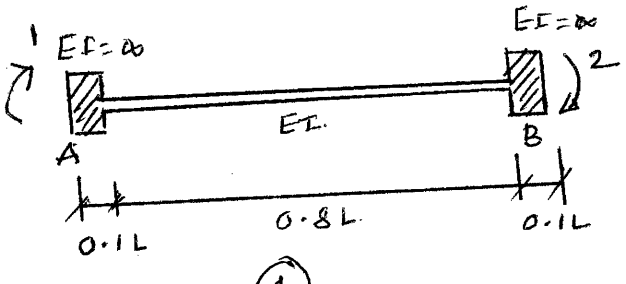
Master file.

Question No		Maximum Marks
Q1(a)	Distinguish clearly the stiffness and flexibility methods of Analysis of Indeterminate Structure.	3
(b)	Analyse the frame shown in figure by flexibility method if the outer temperature of all members rise by 40^0c while there is no change in inner temperature and draw BMD and deflected shape. E = 2 x 10^4 N/mm^2, α_t = 12 x 10^{-6}/ ^{0}c .	10



c/s of all members 600mm dep X 300 mm wide.

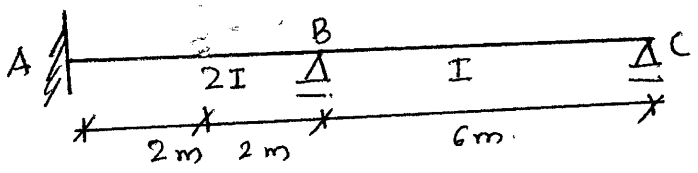
(c)	For the non-prismatic beam element shown in figure calculate the stiffness coefficients K_{11} and K_{21}. Also calculate the COF from A to B	7



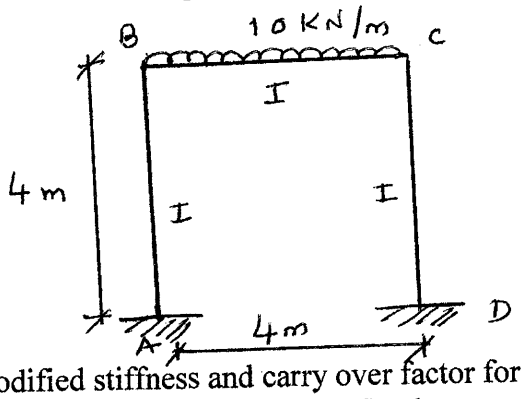
B.Tech. Civil - Sem VII

Advanced Structural Analysis Dt. 26/11/15

Q2(a) Analyse the beam shown in figure by Matrix Stiffness Method. Note that support 'C' settles down by 10 mm. EI= 10,000 KN/m^2. **8**

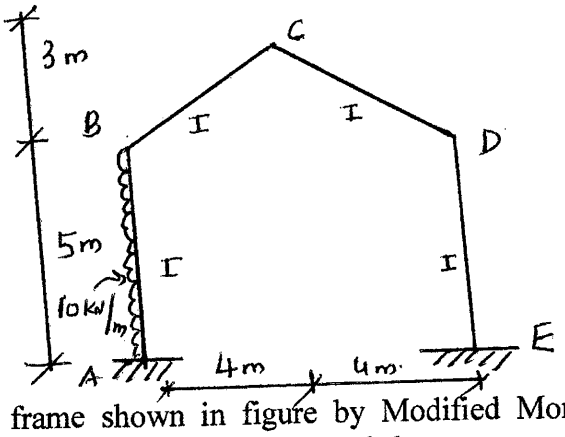


(b) Using Column Analogy Method, analyse the frame shown in figure and draw BMD and deflected shape. **12**

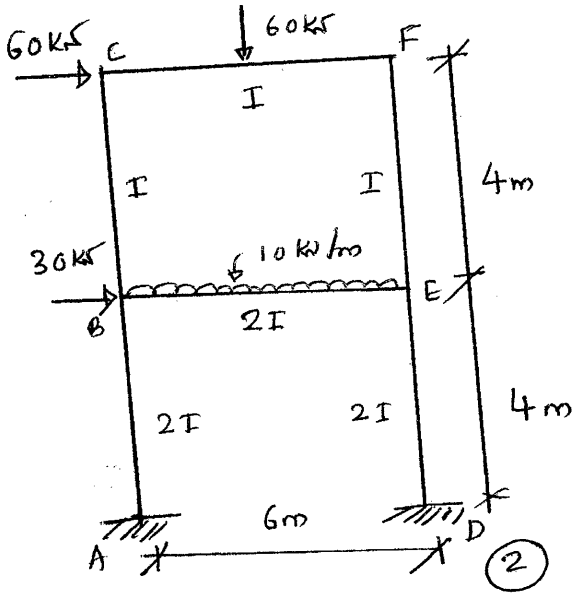


Q3(a) Derive the modified stiffness and carry over factor for a column of a single storey, single bay symmetric frame with fixed supports subjected to Anti - symmetric loads **2**

(b) Analyse the frame shown in figure by Elastic Centre Method and draw BMD, SFD and deflected shape. **18**



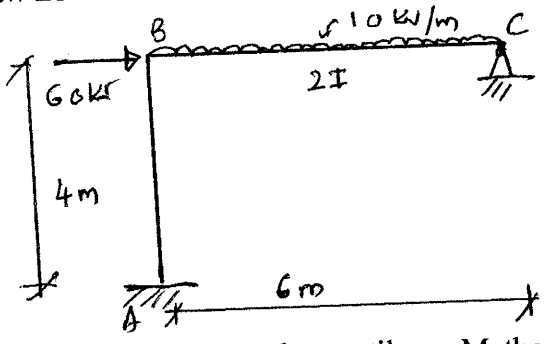
Q4 Analyse the frame shown in figure by Modified Moment Distribution Method and draw SFD, BMD & deflected shape. **20**



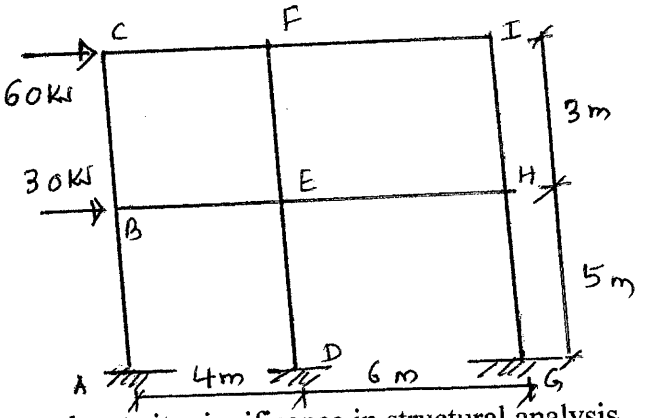
B.Tech. Civil - Sem VII

Advanced structural Analysis Dt. 26/11/15

Q5(a) Analyse rigid jointed plane frame shown in figure by Matrix Stiffness Method and draw BMD and deflected shape. **10**



(b) Analyse the frame shown in figure by cantilever Method and draw SFD, BMD and deflected shape. **10**



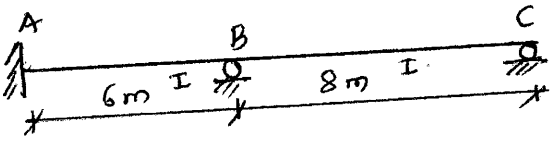
Q6(a) (i) Define ILD and state its significance in structural analysis **2**

(ii) State and explain Muller Breslau's Principle **2**

(b) For the beam shown in figure, construct the ILD for: **16**

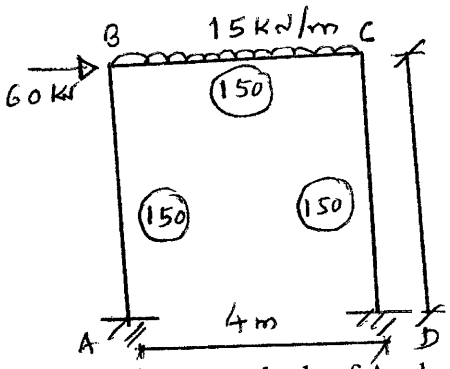
(i) Reaction at 'C' R_c

(ii) Moment at 'A' M_A



Show the ordinates of ILD at 2m intervals

Q7(a) Using plastic analysis, determine the load factor for the frame loaded as shown in figure. The Plastic Moment capacity of each member is indicated in the figure. **16**



(b) Explain the need of approximate methods of Analysis **2**

(c) State the various approximate methods of analysis for vertical and lateral loads **2**

B.Tech. Civil - Sem VII
Environmental Engg - II

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Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Munshi Nagar Andheri (W) Mumbai 400058

End Semester Exam

Nov – Dec 2015

Max. Marks: 100 **Duration: 3 Hrs**

Class: B. Tech **Semester: VII**

Name of the Course: Environmental Engineering II **Program: B. Tech Civil**

Course Code: CE 404

Instructions:

- **Attempt any five questions out of seven**
- **Question No 1 is compulsory**
- **Draw neat sketches/diagrams wherever required**
- **Assume suitable data if necessary and state them clearly** Master file.
- **Figure on right indicate maximum marks for the given question and course outcomes attained**

Q1	**Answer of following questions (Any five)**	**(20) CO1- CO4**
(a)	Illustrate and explain various types of plume behavior in air pollution.	**(04)**
(b)	Explain the sewer shapes and requirement of sewers to flow partially full.	**(04)**
(c)	Comment on the phenomenon of self-purification of streams with factors affecting it.	**(04)**
(d)	Differentiate unit operation from unit processes and illustrate giving examples.	**(04)**
(e)	Differentiate attached growth process from suspended growth process and illustrate giving examples.	**(04)**
(f)	Explain aerobic and anaerobic process with example.	**(04)**
(g)	Define water act 1974 and explain it's salient features.	
Q2	**Answer the following questions**	**(20) CO2, CO3**
(a)	Explain the phenomenon of greenhouse effect and it's repercussions.	**(05)**
(b)	Enumerate and explain any two devices with figures used for air pollution control.	**(05)**
(c)	Convert the following quantities at 1 atm and 30° C (i) 2% CO to mg/L (ii) 350 mg/L SO_2 to ppm	**(05)**
(d)	Explain the sources of soil pollution. Illustrate and explain with figures bioremediation and phytoremediation.	**(05)**
Q3	**Answer the following questions (Any two)**	**(20) CO1-CO2**
(a)	Explain the basic components of pumping station with design steps for the same.	**(10)**
(b)	Explain maintenance of sewerage system. Design a sewer to serve a population of 35,000 people, daily per capita demand is 135 litres, of which 80% finds its way into the sewer. Slope available for sewer to be laid is 1 in 650 and sewer should be designed to carry **four** times the DWF when running full. What would be the velocity of flow in sewer when running full? Assume n=0.013 in Manning's formula.	**(10)**

(1)

B.Tech. Civil - Sem VII
Environmental Engg - II. Dt. 23/11/15

(c) Explain **any two** of the following terms **(10)**
(i) Circular and egg shaped sewers (ii) Self-cleansing velocity
(ii) Lamp hole and cleanout

Q4 Answer the following questions **(20)**
CO1-CO4

(a) Enumerate characteristics of sewage (domestic wastewater). Illustrate with a flowsheet for the treatment used for domestic wastewater with functions of each unit and reduction of BOD and SS in each unit if treated wastewater is to be disposed in surface water. If the wastewater is to be reused in boilers of industry which extra treatment units are required. **(10)**

(b) Explain the importance of BOD/COD ratio. Articulate the reason of why BOD is measured at 20°C for 5 days? A 2% solution of sewage sample is incubated for 5 days at 20°C. Initial dissolved oxygen in sample and control is 7 mg/l. After 5 days incubation the dissolved oxygen in sample falls to 3 mg/l and that in control to 6.8 mg/l. Determine BOD_5 of the sample What will be 5 day BOD at 20°C? Calculate the BOD at 4 days at 27°C. Assume value of K (to base 10) as 0.2 per day at 20°C. **(10)**

Q5 Answer the following questions (any two) **(20)**
CO1, CO3

(a) Differentiate between gravity grit chamber and aerated grit chamber. Design an aerated grit chamber for treatment of sewage with average flow of 0.5 m^3/sec, consider peak factor of 2.75. **(10)**

(b) Explain the following terms **(10)**
(i)Skimming Tank (ii) Parshall flume (iii) detritus tank (iv) Disposal of screenings

(c) Design a septic tank for a hostel of 200 capacity with water supply of 200 LPCD. Also design a suitable soil absorption system for disposal of effluents from the septic tank. **(10)**

Q6 Answer the following questions (any two) **(20)**
CO1, CO3

(a) Explain the mechanism of activated sludge process with figure. Design a continuous flow complete mix activated sludge process (with air requirement and all the checks) to yield an effluent BOD_5 of 10 mg/L. The influent BOD_5 following primary clarification is 200 mg/L. The waste flow is 10 m^3/min. **(10)**
Take Y=0.65, k_d=0.05, θ_c=10 days, MLSS= 3500 mg/L and return sludge concentration is 12000mg/L of SS and MLSS/MLVSS=0.8

(b) Explain the requirement of recirculation in trickling filters. Design a high rate trickling filter with following data **(10)**
Flow = 12 MLD
RR = 2
BOD influent = 350 mg/l
BOD removed= 25 % in PST
Final BOD = 20mg/L

(c) Define the following terms **(10)**
(i) Facultative processes (ii) Nitrification (iii) SVI
(iv) Diffused aeration (v) Food to micro-organism ratio

Q7 **Answer the following questions (any four)** **(20)**
(CO1-CO4)

(a) Determine sludge volume before and after digestion and percentage reduction of 500kg (dry basis) of primary sludge with following characteristics. **(05)**

(2)

B.Tech. Civil - Sem VII

Environmental Engg - II. Dt. 23/11/15

Characteristics	Primary	Digested
Solids	6%	12%
Volatile Solids (VS)	65%	65% (Destroyed)
Sp.gr. of Fixed Solids (FS)	2.5	2.5
Sp.gr. of organic Solids (VS)	~1	~1

(b) Explain the following terms (any two) **(05)**

(i) Stabilization of sludge

(ii) Imhoff tank

(iii) Stabilization pond/Oxidation pond

(c) Explain the salient features of Air Act, 1985 **(05)**

(d) Discuss testing of sewers **(05)**

(e) Explain the salient features of ISO14001 **(05)**

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B.Tech. Civil - Sem VII
Irrigation Engineering.

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam
November 2015

Max. Marks:100 | Duration: 3 hours
Class: B. Tech | Semester: VII | Program: Civil Engineering
Name of the Course: Irrigation Engineering | Course Code : CE403

Master file.

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

Question No		Maximum Marks
Q1 (a)	Explain Duty and Delta. Derive an expression for the same.	6
(b)	State the methods of application of irrigation water and explain the surface irrigation flow system in detail.	7
(c)	A water course commands an irrigation area of 1100 hectare the intensity of irrigation of this area is 75% consider the first 12 days for a crop, total depth requirement is 42 cm. during this period the useful rainfall is 15 cm. calculate the duty for the crop on the field and the outlet factor. Assume transit loss 15%.	7
Q2 (a)	After how many days you will supply the water to soil in order to ensure sufficient irrigation of the given crop. If the field capacity of soil is 28%, permanent wilting point is 13%, dry density of soil is 1.3gm/cm^3, effective depth of root zone is 70 cm and daily consumptive use of water for the given is 12 mm.	7
(b)	Discuss various measures to control sedimentation in dam?	7
(c)	Explain the sprinkler and drip system of irrigation with diagram.	6
Q3 (a)	Discuss classification of dam.	7
(b)	Explain with a neat diagram the entire process and hydrological cycle.	6
(c)	The Isohyets due to a storm of 24 hours in a catchment and the area of the catchment bounded by isohyets were tabulated as below.	7

Isohyets (cm)	77	72	70	67	62	58	55
Area (km^2)	70	40	35	140	80	120	70

Q4 (a)	Discuss briefly various factors necessary for site selection of dam.	7

B.Tech.Civil - Sem VII

Irrigation Engg. Dt. 20/11/15

(b) Derive an expression for steady state discharge through a tube well fully penetrating a confine aquifer. State the assumption also made in the design. 6

(c) Design a irrigation canal in alluvial soil according to lacey's theory for following data: 7

Discharge = 15 cumec

Silt factor = 1

Side slope 1/2H: 1V.

Q5 (a) In a confine aquifer 18 cm diameter well penetrates fully. If the length of the strainer is 20 m what will be the yield of a tube well under 5 m drawdown. Assume steady state condition take K = 30 m/day and radius of influence 300 m. 7

Will the discharge of the tube well be doubled by doubling the diameter of well. Assume all other conditions to remains same.

(b) Define water logging. Explain the various causes of water logging and remedial measures to control them. 7

(c) Discuss briefly the seepage control measures for earthen dam. 6

Q6 (a) The ordinate of a 3-h unit hydrograph are given below: 10

Time (h)	0	3	6	9	12	15	18
Ordinate of 3-h UH (m^3/sec)	0	10	25	16	11	5	0

Derive the flood hydrograph at the catchment outlet due to storm given below :

Time of start of storm	0	3	6	9
Accumulated rainfall (cm)	0	3.9	4.7	7.6

Assume $\emptyset_{index}$ of the catchment as 0.3cm/hr and a constant base flow of 10 m^3/sec.

(b) Define spillways and various types of spillways in detail. 6

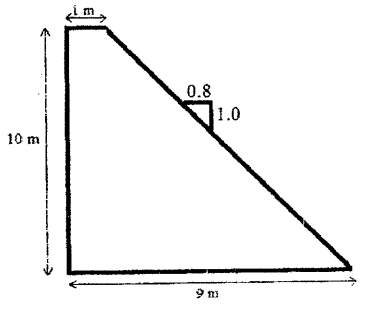
(c) Define precipitation and various forms of precipitation. 4

Q7 (a) Write a brief note on bandhara irrigation. 4

(b) Discuss the causes of failure of earthen dam. 6

(c) A gravity dam is 10 m high. It has a top width of 1 m and base width 9 m. The front face is vertical. Assume that the weight of concrete is 24 KN/m^3 and the water is stored upto the top of the dam. (Density of water 10 KN/m^3) 10

B. Tech. Civil – Sem VII
Irrigation Engg. Dt. 20/11/15.



i. Check the stability against the overturning.
ii. Determine the compressive and principle stresses at the toe of the and heel of the dam
iii. Calculate shear stress at the toe and heel of the dam.

Consider the self weight of concrete and reservoir full condition.

(3)

Library
20/11/2015

Civil - Sem VII
Building Design & Drawing.

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar,Andheri(West),Mumbai 400 058

(A Government Aided Autonomous Institute)

END SEM EXAMINATION

Duration: 4 hour | Marks: 100

Subject: **Building Design and Drawing** | Course code: **CE303**

Class/Branch: **CIVIL** | **Semester: VII**

Note: Master file.

- Q.1 is compulsory.
- Attempt any **four** out of remaining **six** questions
- Assume suitable data if required and state it in the answer sheet.
- Answer the theory questions in the answer sheet and drawing questions on drawing sheet
- Draw or answer each question on a new sheet or page
- Figures to right indicate full marks.

Q.1 It is proposed to construct a commercial cum residential (G+6) RCC building on a plot of 600m^2 near the main station road at Andheri east. The FSI available for the plot is 1.5. The ground floor is proposed to have four shops of 15m^2 each. All the shops are proposed to face the main station road which runs north –south and lies on the west side of the plot. The remaining floors are proposed to have two flats of 2BHK on each floor having the following requirements:

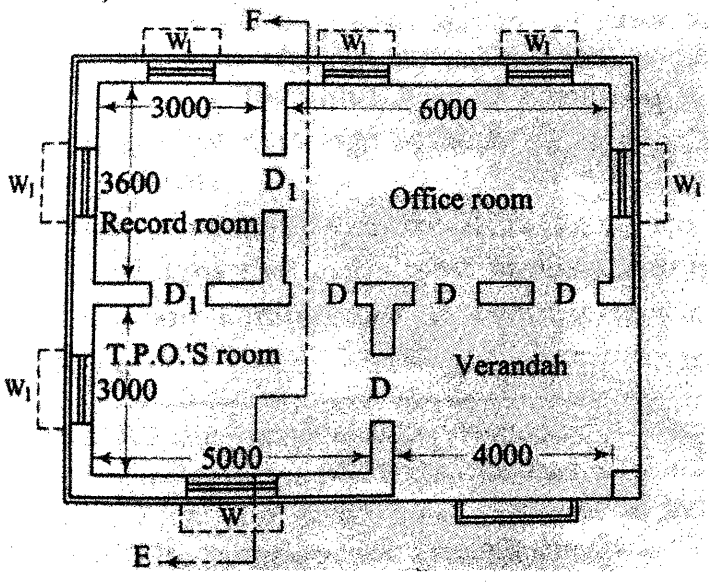
1. Living room – 15m^2
2. Bedroom (2nos.) – 12m^2
3. Kitchen and Dining - 12m^2

Provide adequate sanitary units and passages for the flats. Provision of terrace area, balconies for each flat can be proposed. Provide adequate corridors, lobbies, staircase, and lifts for entry to the residential units. Provide stilt parking and Provide separate entry from the stilt area for each shop. Provide a common sanitary unit for the shops in the stilt area. Also, provide society office and store room on the ground floor.

a	Draw the ground floor line plan	**05**
b	Draw the first floor plan	**10**
c	State the byelaws and principles you have followed while planning the building	**05**

Civil - sem VII Dt. 20/11/15
Building Design & Drawing.

Q.2	**a**	Draw the front elevation of the building you have planned in Q.1.	**05**
	b	Explain under which circumstances you will recommend mezzanine floor, balcony and porch in a building	**05**
	c	Explain the factors to be considered in planning of military town.	**05**
	d	Explain the building bye law for lighting and ventilation	**05**
Q.3	**a**	State the essentials or requirements of a site plan. Draw the site plan for the proposed building you have planned in Q.1 and give the area statement	**10**
	b	Define green building and discuss the design criteria of green building with reference to site selection.	**05**
	c	Enlist the principle of architectural composition and explain contrast.	**05**
Q.4	**a**	Differentiate between isometric and perspective view with neat sketch and also mention the various types of perspective drawings	**08**
	b	Draw the two point perspective of the residential building as shown in Fig.1. The station point is 9m from picture plane and the height of the observer's eye level is 1.5m. Assume suitable dimensions wherever necessary and state it.	**12**



Q.5	**a**	Design and draw a line plan of a college canteen showing the following particulars:	**15**
		1. Dining Hall (general) – 100m^2	
		2. 2 Dining rooms for staff – 30m^2	
		3. Kitchen and service – 40m^2	
		4. Store – 20m^2	
		5. Entrance hall having Photocopy counter and stationary counter – 50m^2	
	b	State the general principles followed for planning a hospital building	**05**
Q.6	**a**	State the importance of drawing sectional elevations of any building. List out the sections one has to draw to show the details of a building	**08**
	b	Draw the sectional elevation for the building you have planned in Q.1 and show all the necessary details.	**12**
Q.7	**a**	Draw the longitudinal and cross section showing the typical reinforcement details of a simply supported RCC beam	**08**
	b	Draw a typical section showing the details of waterproofing at terrace slab level	**06**
	c	Discuss the growth of town according to direction.	**06**

(2)

B.Tech. civil - Sem VII
Solid Waste Management . Dt. 26/11/15

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SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Munshi Nagar Andheri (W) Mumbai 400058

End Semester Exam
Nov – Dec 2015

Max. Marks: 100 **Duration: 3 hrs**

Class: B.Tech **Semester: VII**

Name of the Course: Elective I: Solid Waste Management **Program: B. Tech Civil**

Course Code: CE 410

Instructions:

- Attempt any five questions out of seven.
- Question No 1 is compulsory.
- Draw neat sketches/diagrams wherever required
- Assume suitable data if necessary and state them clearly
- Figure on right indicate maximum marks for the given question and course outcomes attained

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Q1 Answer the following question **(20) CO1- CO4**

(a) The Indian Express story on 28th October 2015 stated
-------"Expressing "dissatisfaction" over the approach of the state government in dealing with illegal dumping of waste by the Brihanmumbai Municipal Corporation (BMC), the Bombay High Court has allowed the dumping sites at Deonar and Mulund to be operational till January 31, 2016. Both sites were supposed to have been shut by November 23, 2015 In March, the BMC filed an application before the HC seeking exemption from immediate discontinuation of dumping at Deonar and Mulund. The corporation said it was seeking the intervention of the court "in the larger public interest, for providing an appropriate waste processing facility for Mumbai." Chief secretary (CS) of the state government Swadheen Kshatriya had submitted an affidavit on the matter. The HC observed that "the affidavit unfortunately doesn't deal with illegal dumping of 6500 MT waste, out of the total 9500 MT generated daily. This is likely to increase to 10,000 to 11,500 MT daily. "If the government does not come out with an effective solution, we will have to consider whether uncontrolled development in the city can continue," said the HC. Stating that several orders had been passed earlier pointing to dumping of 6500 MT of waste contravening law by the BMC in Mumbai, leading to health hazards, the court said, "This infringes on fundamental rights guaranteed under Article 21 (Right to Life)." ----------

Analyze the problem associated and device a methodology to improve the conditions of solid waste management in the city of Mumbai
(Hint: give an approach that should be undertaken by BMC in developing all functional units related to Integrated Solid Waste Management; Give the block diagram of material recovery sheet with front and rear end system that can be included for the type of waste encountered in Mumbai)

Q2 Answer any two of the following questions **(20) CO2, CO3**

(a) Explain the concept of solid waste and it's management. Describe the sources of municipal solid wastes. Deliberate on the factors affecting generation rates of solid waste. **(10)**

(b) Describe the material flow diagram in society and explain the nuances related to assessment of hourly loading rate of vehicles and material recovery facility **(10)**

(1)

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Solid Waste Management . Dt. 26/11/15

(c) Explain various types of wastes and properties (physical, chemical and biological) of waste with ways to quantify the waste stream. **(10)**

Q3 Answer the following questions **(20)**
CO1-CO3

(a) Estimate moisture content of sample of residential MSW with the following typical composition (total weight is 100 kg) **(05)**

Component	% by weight	Moisture content(%)
Food waste	10	70
Paper	30	6
Cardboard	10	6
Plastics	5	2
Rubber	5	2
Leather	5	10
Yard waste	15	60
Wood	15	20
Ash	5	1

If the above waste formula is $C_{450}\ H_{900}\ O_{130}\ N_{15}S_5$. Find it's calorific value using Dulong's formula. Find calorific value on dry basis and ashfree & dry basis too

(b) Explain composting. Enumerate and explain processes (Physical Chemical and Biological) in composting **(10)**

(c) Explain in detail refused derived fuel **(05)**

Q4 Answer the following questions **(20)**
CO1, CO2

(a) Explain the term transfer stations and elaborate on their necessity. Classify them and explain the classifications **(10)**

(b) Find the equations of tradeoff distance between the stationary container System and hauled container system for the following data : **(10)**

Hauled container system	Stationary container system
Quantity of waste = 1500 m^3/wk Container size = 5m^3 Container utilization factor= 0.8 Container pick up time= 0.02 hrs/trip Container unloading time = 0.02 hrs/trip At site time = 0.03 hr/trip Overhead costs= Rs 10000/wk Operational costs = Rs 300/hr of operation	Quantity of solid wastes = 1500 m^3/wk Container size = 5m^3/location Container utilization factor = 0.8 Collection vehicle capacity = 20 m^3/trip Compaction ratio = 2.5 Container unloading time= 0.04 hr/container Overhead cost = Rs 15,000/wk Operational cost = Rs 500/hr of operation At site time= 0.15 hr/trip

Location characteristics

a. Average distance between container locations= 0.15 km
b. Constants for estimating driving time (between pick up location) in both the systems
   HCS : a' = 0.06h/trip and b'= 0.06h/km
   SCS : a'=0.06 hr/location and b'=0.06hr/km
c. Constants for estimating haul distance a= 0.03 hr/trip, b= 0.03hr/km

Q5 Answer the following questions (any two) **(20)**
CO1-CO3

(a) Complete the material balance sheet for the following sorting problem and comment on the efficacy of the material recovery facility: (2) **(10)**

B.Tech. Civil - Sem VII

Solid waste Management. Dt. 26/11/15

Assume 800 kgs of waste described in Table 1 are processed as shown in Figure 1.Using data from Figure 1, calculate the amount of waste recovered by the air classifier, magnet, and screen as well as the amount landfilled. What is the % composition of the landfilled waste?

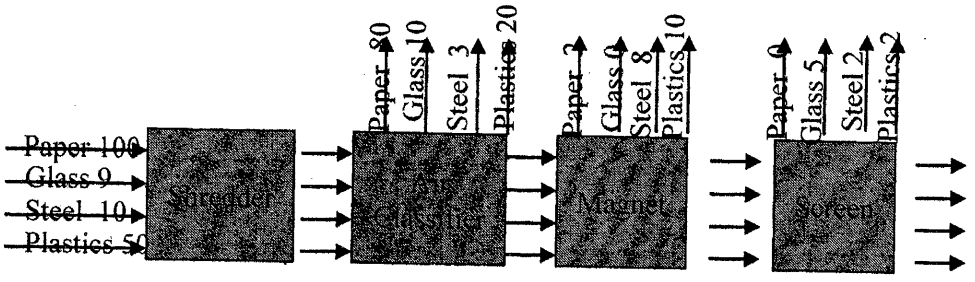

Fig 1.

Table 1.

Component	Collected, (% by weight)
Food Waste	10
Paper	30
Glass	10
Steel	10
Plastics	5
Wood	2
Yard Waste	25
Leather	3
Rubber	5

(b) Explain two methods for volume reduction in detail with equipment/processes used for the same. **(10)**

(c) Write the basic equations for complete aerobic and anaerobic reaction if the initial compound is Ca H_b $O_c N_d$. Estimate the amount of oxygen required to compost 400 kg of solid waste. Assume initial composition of material to be composed given by $[C_6H_3O_2(OH)_8N]_5$ and that the final composition of the waste is $[C_6H_3O_2(OH)_8N]_2$ and 300 kg of material remains after composting. Perform a mass balance too. **(10)**

Q6 Answer following Questions **(20)**

CO1-CO4

(a) Explain hazardous waste? Describe the characteristics of hazardous wastes? How would you treat them? **(10)**

(b) Describe main points of hazardous waste management rules, version 2001 **(05)**

(c) Write a note on incineration in detail. Draw suitable figure. How the conversion products can be derived from incineration **(05)**

Q7 Answer the following Questions **(20)**

CO1-CO4

(a) Explain landfills? State their types? Discuss the construction of secured landfill? Explain the procedure for landfilling **(10)**

(b) Explain with short note **(any two)** **(10)**

(i) OHSAS, 18001

(ii) Conversion of low fuel gas to high fuel gas

(iii) Salient features of Solid Waste Management Rules, 2000

(3)

B.E. (civil) sem VII

Lib – Re-Exam

Limit state method of design for reinforced concrete.

04-01-16

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Limit state method of design for reinforced concrete

Duration : 3 Hours **(100 MARKS)** BE (CIVIL) SEM VII

- **Question No. 1 is compulsory.**
- Attempt any four questions out of remaining six questions.
- Assume any other data needed suitably if not given; but justify the same.
- Illustrate your answers with neat sketches wherever required, though not sought specifically.
- Use of IS 456:2000 is allowed.

Master file.

Q.1 (a) Derive basic coefficients $x_{u\ bal}$, moment of resistance MR_{bal}, P_{tbal} using stress block for singly reinforced RC section. 10

(b) Explain different types of shallow footings provided and under which conditions they are provided. 05

(c) What are the mechanisms by which bond resistance is mobilized in reinforced concrete? 05

Q.2 For the column section 230 x 500 with 3- 20 dia bars on two opposite sides with 50 mm dia effective cover determine strength of column in bending and axial load for xu/ D= 1.3. Assume bending with respect to major axis. Grade of concrete M 20 and steel Fe 415 20

Q.3 Design a two way simply supported slab of effective span of 4.5 met x 5.0 met and subjected to Live load of 4.0 KN / m^2 in addition to self weight and floor finish of 1.0 KN /m^2. Draw plan and section showing reinforcement. 20

Q.4 Design a trapezoidal isolated footing for column of size 230 mm x 650 mm subjected to service axial load of 800 KN with 6- 20 dia bars as reinforcement. SBC of soil is 180 KN /m^2 at depth of 1.5 met. Grade of concrete M 20 and steel Fe 415. Draw A sketch showing reinforcement details. 20

Q.5 (a) For a beam of cross section 230 x 500 with 4-20 dia bars carries service load of 32 KN/m on simply supported span of 6.0 met resting on 230 thk brick wall Calculate ultimate moment of resistance and hence the load factor. 08

(b) Design a circular column to carry an axial service load of 900 KN having effective length of 3.2 met. Grade of concrete M 20 and steel Fe 415. Use spiral reinforcement as links. 12

Q.6 Design the reinforcement in rectangular beam 300 mm wide and 600 mm deep subjected to an ultimate twisting moment of 70 KNm combined with an ultimate bending moment of 160 KNm and an ultimate shear force of 120 KN. Assume M 25 concrete and Fe415 steel and mild exposure conditions . 20

B.E. (civil) Sem VII Dt. 04/01/16.

Limit state method of design for reinforced concrete.

Q.7 Design combined pad footing for column C1 and C2 for following data: 20

Col C1 – 230 x 500 Service load P1 = 650 KN Reinforcement- 4 – 20 dia bars

Col C2 – 230 x 750 Service load P2 = 1100 KN Reinforcement- 8 – 20 dia bars

Centre to centre distance between column= 4.5 met.

Column C1 is on property line . SBC of soil = 200 KN/M2

Grade of concrete M 20 steel Fe 415

Draw section showing reinforcement detail.

Re-Exam Lib
08-01-16

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

GOVERNMENT AIDED AUTONOMOUS INSTITUTE

ANDHERI (WEST), MUMBAI - 400 058.

End Semester Exam (Re - Exam)

Nov – Dec 2015

Max. Marks: 100 **Duration: 03 hours**

Class: **B.Tech. (Civil)** Semester: **VII**

Name of the Course: **Elective I – Advanced Surveying** Program:

Course Code: **CE411**

B.Tech. (Civil) Sem VII
Advanced Surveying.

Instructions:

1. **Attempt any five questions out of seven.**
2. **Question No 1 is compulsory.**
3. **Provide answers with neat sketches, diagrams and figures, wherever applicable**
4. **Assume suitable data if required and state it in the answer sheet**
5. **Answers to all sub-questions should be grouped together**

Master file.

Q.1	**a**	Answer any four:	
		Explain the measurement principle in electronic distance measurement (EDM)	**05**
		Explain 'Spherical triangle' with a neat sketch	**05**
		Define photogrammetry and discuss its limitations	**05**
		List out five applications of integrated use of Remote sensing, GIS and GPS in civil engineering	**05**
		Explain the interaction of electromagnetic radiation with water and soil with neat sketch	**05**
Q.2	**a**	Distinguish between:	
		i. Across track scanner and along track scanner	**08**
		ii. Passive and active sensors	
	b	Discuss various elements of Image interpretation and their significance	**12**
Q.3	**a**	Enlist various types of GPS receivers with their configuration and explain the working of a GPS receiver to determine the coordinates and elevation of a location.	**12**
	b	Define 'GIS'. State any four applications of core GIS in civil engineering. Give names of any two popularly used GIS softwares.	**08**
Q.4	**a**	State various methods of determining flying height and discuss the method that gives most accurate value of flying height.	**08**
	b	A near- polar satellite is orbiting at a height of 900 km. It covers a swath width of 60 km and has spatial resolution of 10m. Average radius of earth may be taken as 6375 km. Find IFOV, swath angle, ground track speed of the satellite, no. of pixels per scan line, no. of orbits per day, no. of days required to cover the globe.	**12**
Q.5	**a**	Define 'relief displacement; with a neat sketch and derive an expression for relief displacement in photographic survey.	**10**

B.Tech.(Civil) Sem VII
Advanced surveying - Dt - 08/07/16.

b A two kilometre straight length of a road AB has the change of elevation from 520 to 210m above MSL on a vertical photograph taken with a camera having focal length of 152.22mm. The photo coordinates are as follows: **10**

Station	x (mm)	y (mm)	Elevation (m)
A	65.6	35.4	520
B	-84.5	24.6	210

If this portion of the road measured directly from the photograph is 80mm, calculate the flying height above MSL. Calculate the horizontal distance between A and B for the same photo coordinates with a flying height of 2800m.

Q.6 **a** Define 'Hydrographic surveying' and enlist some of its common applications. **05**

b X, Y and Z are three shore stations used to fix the position of a float O at sea which lies on the opposite side of XZ to Y. AY is 420m, YZ is 360m, and the seaward angle XYZ is 133°43'. If angles XOY and YOZ are 38°44' and 43°22' respectively, determine the distances XO, YO and ZO. **15**

Q.7 **a** Distinguish between WGS84 datum and Everest Ellipsoid datum **04**

b Estimate the azimuth of the sun having declination of 8°24'S at a place having latitude 49°20'N at sunset. **06**

c Enlist various techniques of Image restoration. Differentiate between nearest neighbourhood method and cubic convolution method with an example. **10**

Lib – Re-Exam
07/01/16

B.Tech. (civil) sem VII
Environmental Engineering-II

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Munshi Nagar Andheri (W) Mumbai 400058

Re-examination

Nov – Dec 2015

Max. Marks: 100 **Duration: 3 Hrs**

Class: B.Tech **Semester: VII**

Name of the Course: Environmental Engineering II **Program: B. Tech Civil**

Course Code: CE 404

Instructions:

- Attempt any five questions out of seven.
- Question No 1 is compulsory.
- Draw neat sketches/diagrams wherever required
- Assume suitable data if necessary and state them clearly
- Figure on right indicate maximum marks for the given question and course outcomes attained

Master file.

Q1	**Answer of following questions (Any five)**	**(20)** **CO1- CO4**
(a)	Illustrate with examples ways to control stack emissions	**(04)**
(b)	Differentiate egg shaped and circular shaped sewers	**(04)**
(c)	Differentiate BOD and COD	**(04)**
(d)	Explain in short types of settling	**(04)**
(e)	Explain nitrification and denitrification	**(04)**
(f)	Enumerate modifications in activated sludge system and explain any two	**(04)**
(g)	Define air act 1981 and it's salient features	
Q2	**Answer the following questions**	**(20)** **CO2, CO3**
(a)	Explain plume behaviour with neat diagrams	**(05)**
(b)	Explain the sources and impacts of air pollution	**(05)**
(c)	Convert the following quantities at 1 atm and 30° C (i) 5% HC to mg/L (ii) 30mg/L NO_2 to ppm	**(05)**
(d)	Explain the sources of soil pollution. Illustrate and explain with figures bioremediation and phytoremediation	**(05)**
Q3	**Answer the following questions (Any two)**	**(20)** **CO1-CO2**
(a)	Explain with short notes on any two (i) Pumping station (ii) Biological filters (iii) self-purification	**(10)**
(b)	A 600 mm dia sewer is required to flow at half depth on a grade ensuring a degree of self cleansing equivalent to full depth at velocity of 0.9 m/s. Find required grade, velocities and discharges at full depth and half depth. Take n=0.015	**(10)**
(c)	What are the different hydraulic elements and the relation that exists between them, which govern the discharge through a sewer	**(10)**

(1)

B.Tech. (Civil) Sem VII
Environmental Engg.-II. 07/01/16.

Q4 Answer the following questions **(20) CO1-CO3**

(a) Enumerate characteristics of sewage (domestic wastewater). Illustrate with a flowsheet for the treatment used for domestic wastewater with functions of each unit and reduction of BOD and SS in each unit if treated wastewater is to be disposed in surface water. If the wastewater is to be reused in agriculture which extra treatment units are required **(10)**

(b) Explain the term population equivalent and relative stability. A dairy processes 120000kg of milk daily. It produces 300 m3 of water daily with a BOD of1600 mg/L Compute **(10)**

i) The wastewater flow per 1000kg of milk received
ii) BOD/1000kg of milk received and
iii) BOD equivalent population hydraulic equivalent population

Assume 40 gm BOD/person/day of wastewater at a flow rate 150 litres/person/day

Q5 Answer the following questions (any two) **(20) CO1, CO3**

(a) Design a grit chamber with rectangular cross section for treating maximum sewage flow of 15 MLD at maximum temperature of 30 °C and min temp of 15 °C. Assume particle size of 0.02 cm, specific gravity of 2.65 and kinematic viscosity at of 15 °C is 1.14×10^{-2} cm^2 Sec^{-1}. **(10)**

(b) Find the efficiency of standard rate trickling filter from the following data: **(10)**
Total flow = 4.7 MLD
BOD present in raw sewage= 190 mg /L
Organic loading = 165 $g/m^3/d$
Surface loading = 2000 $L/m^2/d$

(c) Explain the following **(10)**
(i) Advantages and disadvantages of septic tank
(ii) Disposal of screenings

Q6 Answer the following questions (any two) **(20) CO1, CO3**

(a) Enumerate and explain problems associated with activated sludge process. **(10)**
Average operation data for activated sludge is
Sewage flow = 30 MLD, Volume of aeration tank = 12000 m^3, Influent BOD = 300 mg/L, Effluent BOD = 30 mg/L, MLSS = 4500 mg/L, Effluent SS= 45 mg/l, Waste solids = 12000 mg/l, Quantity of waste sludge= 25 m^3
Based on above find: Aeration period, F/M, % efficiency And Sludge Age

(b) Discuss in detail the factors affecting on the selection of sewer materials. **(10)**

(c) Derive the term associating recycle ratio with sludge age. Explain SVI and procedure to determine it **(10)**

Q7 **Answer the following questions (any four)** **(20) (CO1-CO4)**

(a) Deliberate on various types of ponds in wastewater treatment and explain in detail on their working **(05)**

(b) Explain the following terms **(05)**
(i) Thickening of sludge
(ii) Imhoff tank
(iii) Sludge conditioning

(c) Explain the anaerobic digestion process in detail. Explain the design of the digester in short. **(05)**

(d) Explain the process of constructing sewers **(05)**

(e) Explain the salient features of Water Act, 1974 **(05)**

(2)