



Bharatiya Vidya Bhavan's  
**Sardar Patel College of Engineering**

(A Government Aided Autonomous Institute)

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

**RE EXAMINATION**

**June 2016**



Max. Marks: 100

Class: Final Year B. Tech

Semester: VII

Duration: 3 Hrs

Program: Civil Engineering

**Name of the Course: Irrigation Engineering**

Course Code : CE403

**Instructions:**

- 1) Attempt any five questions.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figure to the right side indicate full marks.
- 4) Use of Scientific calculator is allowed.
- 5) Assume suitable data if necessary and state it clearly.

*Master file.*

Q.No			Marks	Course Outcome Number	Module No.
1	a	Discuss advantages of irrigations	5	CO1	1
	b	Explain the following terms: i. Base period ii. Crop Period iii. Kor Period iv. Crop rotation v. Intensity of irrigation.	10	CO3	2
	c	Describe various components of soil moisture relationship.	5	CO1	2
2	a	Define precipitation and various types of precipitation with diagram.	10	CO1	3
	b	Briefly describe various systems of irrigation.	10	CO2	2
3	a	Explains various methods of estimation of missing rainfall. The normal rainfall at station A, B, C and D over a basin are 99.9, 75.77, 89.2 and 112.4 cm respectively. In a particular year the station D was inoperated and the station A, B and C recorded annual precipitation of 100.6, 95.66 and 83 cm respectively. Find the missing rainfall value at station D for that year.	10	CO1	3
	b	Explain various factors affecting duty and delta.	5	CO1	2
	c	Explain recuperation test for open well.	5	CO1	4

Q.No			Marks	Course Outcome Number	Module No																
4	a	Discuss various factors affecting runoff.	8	CO1	3																
	b	Explain the following terms with neat sketch: (i) Mass Curve (ii) Hydrograph (iii) Double Mass Curve	12	CO1	3																
5	a	Explain unit Hydrograph. Determine the ordinate of 9-hr UH form given 3-hr UH.	10	CO1	3																
<table border="1"> <thead> <tr> <th>Time (h)</th> <th>0</th> <th>3</th> <th>6</th> <th>9</th> <th>12</th> <th>15</th> <th>18</th> </tr> </thead> <tbody> <tr> <td>Ordinate of 3-h UH (m<sup>3</sup>/sec)</td> <td>0</td> <td>70</td> <td>190</td> <td>140</td> <td>90</td> <td>40</td> <td>0</td> </tr> </tbody> </table>						Time (h)	0	3	6	9	12	15	18	Ordinate of 3-h UH (m <sup>3</sup> /sec)	0	70	190	140	90	40	0
Time (h)	0	3	6	9	12	15	18														
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	b	Discuss various forces acting on gravity dam in detail.	10	CO1	6																
6	a	Discuss in brief various investigation required for reservoir planning.	10	CO2	5																
	b	Write short note on arch and butters dam.	5	CO1	6																
	c	Define spillways and Syphon spillways in detail.	5	CO1	6																
7	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.	8	CO1	4																
	b	Discuss in detail the design procedure for canal design using Kennedy's theory and also explain the limitations of same.	6	CO1	7																
	c	Explain seepage control measures in case of earthen dam.	6	CO1	6																

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Re Exam  
May 2016

Q. P. Code: CE 401  
Duration: 3 hrs  
Program: Civil Engg

Max. Marks: 100  
Class: Btech Semester: VII  
Name of the Course: Limit State Method for RCS  
Course Code : CE 401

Master file.

**Instructions:**

- a) Use of IS 456: 2000 is permitted
- b) Q.No. 1 is compulsory. Solve any 4 out of the remaining questions,
- c) Draw reinforcement details wherever necessary. Assume suitable data wherever required
- d) Figures to right indicate full marks.

Question No		Maximum Marks	Course Outcome Number
Q1 a)	What do you mean by Limit State. Explain various limit states. .	05	1,2
b)	What are the functions of longitudinal and transverse steel in column?	05	1
c)	From the first principles derive stress block parameters for limit state method for singly reinforced section.	05	1
d)	Draw stress distribution diagram for concrete (in flexure) used in LSM and ULM.	05	2
Q2 a)	Why doubly reinforced beam is required?	04	1
b)	A reinforced concrete beam 230mm wide and 500mm effective depth is used to carry load of 40kN/m.Design the beam using M25 and Fe 41.5	16	1,2
Q3 a)	A rectangular beam 230mm x450mm effective depth is reinforced with 6 bars of 16mm dia out of which 2 bars are bent at 45°.Determine the shear resistance of bent up bars and additional shear reinforcement required if ultimate shear force is 300kN.Use M20 and Fe 415	10	1,2
b)	A TEE beam section hs following dimensions: Width of flange- 1200mm      Depth of flange:120mm Width of web: 230mm      Effective depth of section:500mm Ast-6 bars of 16mm dia. Compute Moment of resistance of section.Use M20 and Fe 415	10	1,2
Q4)	Design a simply supported slab for a room size of 4mx 6m.Use M20 and Fe 415.Assume L.L-2 kN/m2 and F.F -1.5kN/m2.Draw bottom plan reinforcement and section along long and short span. Give appropriate checks.	20	1,2

Q5 a)	Explain different types of footing provided under different conditions.	04	1
b)	Design combined rectangular pad footing for two columns A and B carrying load of 800kN and 1000kN respectively. Column A is square column of size 400mm while B is square column of size 500mm and they are placed at 4m centre to centre. Assume width of footing as 1.5 m and SBC of soil as 200kN/m <sup>2</sup> . Use M20, Fe 415. Draw reinforcement details also.	16	1,2
Q6 a)	A rectangular beam 230mm x 550mm effective depth is subjected to sagging moment of 40kN-m, shear force of 30kN and twisting moment of 12kN-m. Take load factor as 1.5. Design reinforcement. Use M20 and Fe 415.	15	1,2
b)	Derive expression for M.R for singly reinforced section using Whitney's Stress block parameter.	05	1
Q7 a)	A short column of size 230mm x 350mm is subjected to factored load of 1500kN. If unsupported length is 3.2 m, design the column. Use M20 and Fe 415.	08	1,2
b)	Design a helically reinforced short rectangular column to carry an axial load of 1200 kN at service condition. Use M20 and Fe 415	12	1,2

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**End Semester Re-Exam**  
June 2016

**Max. Marks: 100**

**Class: B.Tech.**

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

**Course Code: CE411**

**Duration: 03 hours**

**Semester: VII**

**Program: Civil Engg.**

**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.

<b>Q.1</b>	<b>a</b>	Answer any four:	
		Define electronic distance measurement (EDM) used for surveying and explain its importance in advanced surveying	<b>05</b>
		Give any three remote sensing satellite systems. Give any two image processing software.	<b>05</b>
		List out the errors introduced in a GPS. Explain in brief	<b>05</b>
		State the advantages and limitations of visual image interpretation	<b>05</b>
		Explain the interaction of electromagnetic radiation with soil and vegetation with neat sketch	<b>05</b>
<b>Q.2</b>	<b>a</b>	Explain with neat sketch the 3D viewing concept by using mirror stereoscope.	<b>08</b>
	<b>b</b>	List the methods of fixing the positions of soundings and explain any one method in detail with a neat sketch	<b>12</b>
<b>Q.3</b>	<b>a</b>	Enlist various types of GIS software. Give the advantages of using GIS for civil engineering projects and state at least five applications of GIS related to infrastructure related projects.	<b>12</b>
	<b>b</b>	Define Mean Sea Level and explain the procedure to establish the mean sea level	<b>08</b>
<b>Q.5</b>	<b>a</b>	Define: 1. Swath 2. Nadir 3. Spatial resolution 4. Spectral resolution 5. Orbital period	<b>05</b>
	<b>b</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 in Blue-green band of 0.45-0.52 $\mu$ m. Average radius of earth may be taken as 6380 km. Design the following parameters for the	

		satellite system: IFOV, swath angle, ground track speed of the satellite, no. of pixels per scan line, no. of orbits per day, revisit period.	15
Q.5	a	Explain with example any two elements of visual interpretation that help us to get good amount of information that can be used for analysis or execution of a civil engineering project.	08
	b	The length of line MN and the elevation of the endpoints, M and N, are to be determined from a stereo pair containing images m and n. The camera has a lens of focal length of 152.4mm. The average flying height was 1200m and the airbase was 600mm. The measured photographic coordinates of point M and N in the flight line coordinate system are $x_m = 54.61\text{mm}$ , $x_n = 98.67\text{mm}$ , $y_m = 50.80\text{mm}$ , $y_n = -25.40\text{mm}$ , $x'_m = -59.45\text{mm}$ and $x'_n = -27.39\text{mm}$ .	12
Q.6	a	Compare remote sensing and photogrammetry.	05
	b	A study area is 20Km wide in the east west direction and 32km 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 500m above datum. Perform the computations necessary for developing a flight plan and draw the flight plan.	15
Q.7	a	Define: 1. Exposure station 2. Fiducial marks 3. Flight line 4 Principal point 5. Pixel coordinate system	12
	b	Estimate the hour angle and declination of a star if the latitude of place is $49^\circ 20' \text{N}$ , Azimuth = $51^\circ 20' \text{W}$ , altitude = $26^\circ 48'$	08