



BHARATIYA VIDYA BHAVAN'S  
**SARDAR PATEL COLLEGE OF ENGINEERING**  
Munshi Nagar, Andheri (West), Mumbai 400 058  
(A Government Aided Autonomous Institute)



**END SEM RE-EXAM**

Duration: 4 hour

Marks: 100

Subject: **Building Design and Drawing**

Course code:

Class/Branch: **S.Y.B.Tech - Civil**

**Semester: IV**

**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.

			<b>Max. Marks</b>
<b>Q.1</b>		A RCC framed double storied bungalow is to be planned in a plot of land 2700 square feet (sq.ft.). The maximum permissible plinth area is 900 sq.ft. and the total built up area is 1800 sq.ft. Following accommodation is to be provided: i. Living room, drawing hall & Kitchen cum dining room on ground floor. ii. Bed room (2 no.) with attached bath & Children's room /Study room on first floor Provide adequate sanitary units, passage, verandah, staircase etc	
	<b>a</b>	Draw ground floor plan.	<b>12</b>
	<b>b</b>	Draw Front Elevation	<b>08</b>
<b>Q.2</b>	<b>a</b>	Draw the site plan along with the area statement showing calculations for Built up area, Carpet area, and F.S.I for the data structure you have planned in Q. 1.	<b>10</b>
	<b>b</b>	Draw first floor line plan for the data given in Q.1.	<b>10</b>
<b>Q.3</b>		Draw cross sectional elevation passing through the stair, a door, a window and the sanitary unit for the structure you have planned in Q.1.	<b>20</b>
<b>Q.4</b>	<b>a</b>	Draw a neat sketch of Sun path diagram and explain the use of sun path diagram for planning different residential units.	<b>10</b>

	<b>b</b>	State and explain the general building bye laws that one needs to follow while planning any residential unit.	<b>10</b>
<b>Q.5</b>		Explain in detail with proper sketches:	<b>20</b>
	<b>a</b>	Basic planning requirements of Circulation	
	<b>b</b>	Essentials of a Foundation plan	
	<b>c</b>	FSI and its importance in planning	
	<b>d</b>	Setbacks for a residential building	
<b>Q.6</b>		Draw the Foundation Plan with detailed section of the foundation for the structure you have planned in Q.1	
<b>Q.7</b>	<b>a</b>	Draw the Terrace plan with a section showing waterproofing details for the structure planned in Q.1.	<b>10</b>
	<b>b</b>	Design and draw the plan and section of an open well Staircase for a floor height of 3.5m.	<b>10</b>



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**Re-Examination**

**January 2017**



4

Maximum Marks: 100

Class: S.Y.B.Tech

Name of the Course: Probability & Statistics

Semester: IV

Duration: 3 hours

Program: Civil Engineering

Course Code : BTC226

Master file.

**Instructions:**

- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.

Q		Marks	C O	Module																		
1(a)	Evaluate $\int_C (\bar{z})^2 dz$ , where $C:  z-1 =1$	6	2	5																		
(b)	It is claimed that a random sample of 1000 tyres with a mean life of 15629 kms is drawn from a population of tyres which has a mean life of 15200 kms and a standard deviation of 1248 kms. Test the validity of claim at 5% level of significance	6	1	3																		
(c)	Find the lines of regression and coefficient of correlation for the following data <table border="1" style="margin: 10px auto;"> <tr> <td>X</td> <td>65</td> <td>66</td> <td>67</td> <td>67</td> <td>68</td> <td>69</td> <td>70</td> <td>72</td> </tr> <tr> <td>Y</td> <td>67</td> <td>68</td> <td>65</td> <td>66</td> <td>72</td> <td>72</td> <td>69</td> <td>71</td> </tr> </table>	X	65	66	67	67	68	69	70	72	Y	67	68	65	66	72	72	69	71	8	1	1
X	65	66	67	67	68	69	70	72														
Y	67	68	65	66	72	72	69	71														
2 (a)	If $\theta$ is the acute angle between the two regression lines, then prove that $\tan \theta = \frac{1-r^2}{r} \cdot \frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2}$ , where $r, \sigma_x, \sigma_y$ have their usual meanings.	6	1	1																		
(b)	Solve the following NLPP using Kuhn-Tucker conditions: Maximize $Z = 2x_1^2 - 7x_2^2 + 12x_1x_2$ Subject to $2x_1 + 5x_2 \leq 98$ , $x_1, x_2 \geq 0$	6	3	7																		
(c)	Find mean and variance of Binomial distribution	8	1	2																		
3 (a)	The equations of the lines of regression are $20x - 9y - 107 = 0$ and $4x - 5y + 33 = 0$ Find $\bar{x}, \bar{y}$ and $r$	6	1	1																		

(b)	Use Cauchy's Integral formula to evaluate $\int_C \frac{\sin(\pi z^2) + \cos(\pi z^2)}{(z+1)(z-3)} dz$ , where $C: z =4$	6	2	5																
(c)	Solve the following linear programming problem by the simplex method Maximize $Z = 6x_1 - 2x_2 + 3x_3$ Subject to $2x_1 - x_2 + 2x_3 \leq 2$ $x_1 + 4x_3 \leq 4$ $x_1, x_2, x_3 \geq 0$ .	8	3	6																
4 (a)	The probability that the pen manufactured by a company will be defective is $\frac{1}{10}$ . If 12 such pens are manufactured, find the probability that (i) exactly two will be defective (ii) at least two will be defective (iii) none will be defective	6	1	2																
(b)	Measurements of the diameters of a random sample of 200 ball bearings made by a certain machine during one week showed a mean of 0.824 inches and a standard deviation of 0.042 inches. Find 95% and 99% confidence limits for the mean diameter of all the ball bearings	6	1	3																
(c)	Obtain all Taylor's and Laurent's series expansions of $f(z) = \frac{3z-1}{z^2-7z+12}$ about $z=0$ indicating the region of convergence.	8	2	5																
5 (a)	In a certain factory producing certain articles the probability that an article is defective is 0.03. The articles are supplied in packets of 50. Find approximately the number of packets containing (i) one defective, (ii) two defective articles in a consignment of 5000 packets	6	1	2																
(b)	Obtain the rank correlation coefficient from the following data <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>X</td> <td>10</td> <td>12</td> <td>18</td> <td>18</td> <td>15</td> <td>40</td> </tr> <tr> <td>Y</td> <td>12</td> <td>18</td> <td>25</td> <td>25</td> <td>50</td> <td>25</td> </tr> </tbody> </table>	X	10	12	18	18	15	40	Y	12	18	25	25	50	25	6	1	1		
X	10	12	18	18	15	40														
Y	12	18	25	25	50	25														
(c)	The probability density function of a random variable is <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>P(X)</td> <td>k</td> <td>3k</td> <td>5k</td> <td>7k</td> <td>9k</td> <td>11k</td> <td>13k</td> </tr> </tbody> </table> Find (i) k (ii) $P(X < 4)$ (iii) $P(3 \leq X \leq 6)$ (iv) mean	X	0	1	2	3	4	5	6	P(X)	k	3k	5k	7k	9k	11k	13k	8	1	2
X	0	1	2	3	4	5	6													
P(X)	k	3k	5k	7k	9k	11k	13k													

6(a)	The weights of 4000 students are found to be normally distributed with mean 50 kilograms and standard deviation 5 kgs. Find the number of students with weights (i) less than 45 kgs. (ii) Between 45 and 60 kgs.	6	1	2												
(b)	The mean lifetime of a sample of 25 bulbs is found as 1550 hours with a S.D of 120 hours. The company manufacturing the bulbs claims that the average life of their bulbs is 1600 hours. Is the claim acceptable at 5% LOS?	6	1	4												
(c)	Evaluate $\int_C \frac{1}{z(2z-1)(z-3)} dz$ where $C: z =5$	8	3	5												
7(a)	Using complex variables evaluate $\int_0^{2\pi} \frac{1}{5-3\cos\theta} d\theta$	6	3	5												
(b)	Two independent samples from normal population with equal variance gave the following results <table border="1" data-bbox="343 918 973 1077"> <thead> <tr> <th>Sample</th> <th>Size</th> <th>Mean</th> <th>S.D</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>16</td> <td>23.4</td> <td>2.5</td> </tr> <tr> <td>2</td> <td>12</td> <td>24.9</td> <td>2.8</td> </tr> </tbody> </table> <p>Is the difference between the mean significant?</p>	Sample	Size	Mean	S.D	1	16	23.4	2.5	2	12	24.9	2.8	6	1	4
Sample	Size	Mean	S.D													
1	16	23.4	2.5													
2	12	24.9	2.8													
(c)	Using big M method solve the following LPP Maximize $Z = 3x_1 - x_2$ Subject to $2x_1 + x_2 \geq 2$ $x_1 + 3x_2 \leq 3$ $x_2 \leq 4$ $x_1, x_2 \geq 0.$	8	2	6												



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End Semester Re-exam, January 2017



(A)

Max. Marks: 100  
Class: S.Y.B.Tech. Semester: IV  
Name of the Course: Surveying-II

Q. P. Code:  
Duration: 3 hour  
Program: Civil  
Course Code : BTC- 227

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	C.O.	Mod.																
Q1	(a) Discuss in brief sources of errors in tacheometry.	05	C.O.1	5																
	(b) Define Degree of curve. Calculate radius, mid ordinate and length of tangent for $3^0$ curve (arc length 30 m) having deflection angle of $62^0$ ?	04	C.O.1	1																
	(c) Explain application of GIS in Civil Engineering Project.	04	C.O.3	3																
	(d) How will you conduct setting out work for small bridge?	07	C.O.3	6																
Q2	a) The following observations were made with a tacheometre having $K=100$ and $C=0$ .	12	C.O.1	5																
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Instr. Station</th> <th>Staff Station</th> <th>H.I.</th> <th>Bearing</th> <th>Vertical angle</th> <th>Stadia Reading</th> </tr> </thead> <tbody> <tr> <td rowspan="2">A</td> <td>P</td> <td>1.5</td> <td><math>80^0</math></td> <td><math>+3^0 40'</math></td> <td>0.965, 1.350, 1.735</td> </tr> <tr> <td>Q</td> <td>1.5</td> <td><math>142^0</math></td> <td><math>-5^0 20'</math></td> <td>1.205, 1.320, 1.435</td> </tr> </tbody> </table> <p>Calculate (i) Distance PQ; (ii) R.L. of P and Q and Gradient of line PQ (Note RL of A =250.50 m),</p>	Instr. Station	Staff Station	H.I.	Bearing	Vertical angle	Stadia Reading	A	P	1.5	$80^0$	$+3^0 40'$	0.965, 1.350, 1.735	Q	1.5	$142^0$	$-5^0 20'$	1.205, 1.320, 1.435	08	C.O.1
Instr. Station	Staff Station	H.I.	Bearing	Vertical angle	Stadia Reading															
A	P	1.5	$80^0$	$+3^0 40'$	0.965, 1.350, 1.735															
	Q	1.5	$142^0$	$-5^0 20'$	1.205, 1.320, 1.435															
b) Describe in detail the method of setting out curve using offset from Back tangent (Radial as well as perpendicular offsets).																				
Q3	(a) A gradient of $-1.5\%$ meets a gradient of $+2.0\%$ at a chainage of 1400 m and elevation of 180 m. A vertical curve of length 200m is to be set out with pegs at 20m interval. Calculate the elevation of all points by method of your choice?	10	C.O.1	2																
	(b) Derive an expression for the horizontal distance and elevation of staff station, when the staff is held vertical to the line of sight and vertical angle is angle of elevation.	10	C.O.1	5																

Q4	(a) Derive an expression for determining strength of a figure.	08	C.O.1	7
	(b) Describe with neat sketch setting out work of a culvert?	08	C.O.1	6
	(c) What do you mean by self compensating Instrument?	04	C.O.1	3
Q5	(a) A road bend which deflects $60^\circ$ is to be designed for a maximum speed of 75 Km/ hr with a circular arc combined with two cubic spirals. If the radius of circular curve is 300 m and the max. rate of change of radial acceleration is $0.3 \text{ m/sec}^2/\text{sec}$ . Calculate i) Length of transition curve, ii) The chainages of the salient points, if the chainage of point of intersection is 2200m.	10	C.O.1	2
	(b) Explain in detail the procedure for setting out simple curve by Chain and Theodolite method.	10	C.O.1	1
Q6	(a) Describe in detail field work and computational work required for the 'Block Contouring project 'conducted during survey camp.	07	C.O.1	3
	(b) A compound curve is to connect two straights having deflection angle of $75^\circ$ . The lengths of two tangents are 145.18 m & 163.47 m respectively. Calculate the radius of second arc, if the radius of the first arc is to be 195 m.	08	C.O.3	1
	(c) Discuss in short instruments used in precise levelling.	05	C.O.1	4
Q7	<b>Write short notes on the following (any four):</b>			
	(i) Constants of a tacheometer	05	C.O.3	5
	(ii) Advantages and disadvantages of Reverse curve	05	C.O.3	1
	(iii) Electronic Tacheometer	05	C.O.1	3
	(iv) Base line measurement	05	C.O.1	7
	(v) use of software in contour map	05	C.O.2	3
(vi) Sight distance on a vertical curve	05	C.O.1	2	



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End Semester Exam  
January 2017



Max. Marks: 100

Class: SY

Semester: IV

Name of the Course: Concrete Technology

Duration: 3 Hours

Program: B.Tech

Course Code : BTC230

Master file.

**Instructions:**

- Q1 is compulsory to attend
- Assume appropriate any missing data

Question No		Maximum Marks	Course Outcome Number	Module No.
Q1.(a)	Briefly explain Sulphate resisting portland cement and their uses.	05	3	1
(b)	Define aggregate. Briefly explain any 3 characteristics of it which affects the concrete.	05	1	
(c)	Enlist the types of admixtures. Write short note on Superplasticizers.	05	1	
(d)	Define workability of concrete. List the factors affecting it and briefly explain any two factors	05	1	
Q2. (a)	Explain the precaution required during under water concreting.	05	3	2
(b)	Explain in details the effects of Hot weather and cold weather on concrete.	10	3	
(c)	Explain in details Slump Test for concrete with a neat sketch.	05	3	
Q3.(a)	Design a concrete mix for M40 grade of concrete with the following data using IS:10262 code Type of cement : OPC 43 grade Maximum size of aggregate: 20 mm Workability : 125 mm slump Minimum cement content : 340 Kg/m <sup>3</sup> Take w/c ratio: 0.38 Method of placing concrete: pumping Type of aggregate : crushed angular Admixture : Super plasticizer Specific gravity of Coarse agg : 2.70 Specific gravity of fine agg : 2.60 Grading of fine agg : Zone II	20	2	3



	Dosage of admixture: 1.25% weight of cement Specific gravity of admixture : 1.15 Specific gravity of cement : 3.15			
Q4. (a)	Define High Performance Concrete. Discuss the advantages of HPC over ordinary concrete.	08	3	4
(b)	List out the salient requirements of High performance concrete	07	3	
(c)	Differentiate between High strength concrete and High Performance concrete.	05	3	
Q5.(a)	Give a typical layout of the site for Ready mix concrete plant. Explain in details about transit mixer of Ready mix concrete	14	3	5
(b)	What are the advantages and disadvantages of ready mix concrete?	06	1	
Q6. (a)	What do you mean by Fiber Reinforced Concrete? List out its types, application, advantages and disadvantages of FRC	10	1	6
(b)	What do you mean by Polymer concrete? List out its types and advantages of Polymer concrete.	10	1	
Q7. (a)	Explain in details Half Cell Potentiometer test with neat sketch.	10	3	7
(b)	Define NDT. Briefly explain hammer test with neat sketch	10	3	