



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

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



Max. Marks: 100  
Class: B.Tech Semester: III  
Name of the Course: Building Construction

Q. P. Code:  
Duration: 3 Hrs  
Program: Civil Engineering  
Course Code : BTC 206

**Instructions:**

1. Q.1 is compulsory & solve any four remaining six.
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.
4. Use Drawing sheet for only question no.3

Question No		Max. Marks	Course Outcome Number	Module no.
Q.1	<b>Write a short note on following points (Any four)</b> a) Reinforced brick masonry b) Bay windows c) Queen post truss d) Thermal Insulating Materials e) Slip forms	20	1,2,3,	1-7
Q.2	A) Explain stone masonry (any four types) Also draw & explain Flemish bond for one & half brick thick wall.	10	01	02
	B) Explain reasons for failure of foundation & its preventative measures.	06		
	C) Explain shortly method of Pointing	04		
Q.3	A) Draw a neat sketch of following types of doors, 1) Revolving door 2) Swing door	04	01	03
	B) Draw a neat sketch of following types of windows, 1) Casement Window 2) Sliding Window	04		
	C) Design a dog-legged stair for residential building having staircase hall inside dimension is 1.50 M X 4.00 M. the height of floor is 3.30 M & roof consists of R.C.C. Slab of 12 CM thickness. Draw a plan & sectional elevation which is passing through stair.	12		
Q.4	A) Write a short note on: Truncated & Bel-fast Roof	08	01	04
	B) Write a short note on following types of floorings 1) Terrazo Flooring 2) Block flooring	08		
	C) What factors to be considered while selecting type of roof?	04		

	<b>(any four)</b>			
Q.5	A) Explain fire protection systems provided in building to resist fire load with sketch <b>(any two)</b> Also explain fire resisting properties of common building materials. <b>(any four)</b>	08	02	06
	B) Compare Timber sheet pile Vs. composite pile <b>(any four points)</b> Also explain timber & truss centering.	08	01	02
	C) Explain various types of sound absorbent materials.	04	02	06
Q.6	A) Explain the piping systems in plumbing services for a Building with a neat sketches & details.	08	02	06
	B) What is Damp Proofing? Explain its causes & effects over building structures. <b>(any two)</b> Also explain how DPC should be provided with sketches.	08	03	
	C) Explain shortly the methods of termite proofing. <b>(any four)</b>	04	03	
Q.7	A) What do you understand by "Green Building"? Also explain advantages of Green Building. <b>(any five)</b>	10	01	07
	B) Explain the all criteria's given by GRIHA's rating agency for certifying green building.	10		



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**SARDAR PATEL COLLEGE OF ENGINEERING**  
(An Autonomous Institution Affiliated to University of Mumbai)  
Munshi Nagar Andheri (W) Mumbai 400058



**Re-Examination**  
**June- 2018**

**Max. Points: 100**

**Duration: 3 Hrs**

**Class: S.Y. B. Tech**

**Semester: III**

**Course: Engineering Materials**

**Course Code: BTC 204**

**Instructions:**

- Solve any five questions
- 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, course outcomes attained and module no. of questions

Q1	Answer the following Questions	Points	CO	Module
(a)	Explain the properties and uses of Bitumen.	(04)	CO1	M6
(b)	Write the field tests performed on bricks for its suitability.	(04)	CO2	M2
(c)	Describe the factors for selection of construction material on the basis of economy.	(05)	CO1	M4
(d)	Explain the various methods of preservation of stones	(07)	CO2	M2
Q2	Answer the following Questions			
(a)	Describe the procedure for preparing lime-surkhi mortar.	(06)	CO1	M3
(b)	Explain the qualities of good building stone.	(06)	CO2	M2
(c)	With neat sketches explain the manufacturing process of bricks.	(08)	CO2	M2
Q3	Answer the following Questions			
(a)	Describe the properties of Rapid hardening and low heat cement.	(05)	CO2	M3
(b)	Discuss the uses of Earthen ware and Terracotta in Civil Engineering	(05)	CO1	M4
(c)	Define following properties of materials : (i) creep, (ii) elasticity, (ii) ductility, (iii) density, (v) shrinkage	(05)	CO1	M1
(d)	State the sequential steps involved in the preparation of cement mortar 1:3.	(05)	CO2	M3

		Points	CO	Module
<b>Q4</b>	<b>Answer the following Questions</b>			
(a)	What are the ingredients required for manufacturing of cement along with their properties?	(06)	CO1	M3
(b)	What are the uses of Glasses?	(04)	CO2	M5
(c)	Mention the classification of steel and explain the Properties of hard steel and mild steel?	(06)	CO2	M5
(d)	Describe in brief different types of Sound proof Materials.	(04)	CO1	M7
<b>Q5</b>	<b>Answer the following Questions</b>			
(a)	State any two uses of asbestos fiber in construction.	(05)	CO2	M7
(b)	Explain the properties of solid concrete blocks.	(04)	CO2	M7
(c)	What are the properties and uses of Tar and asphalt?	(06)	CO2	M6
(d)	Write short note on Seasoning of timber.	(05)	CO1	M5
<b>Q6</b>	<b>Answer the following Questions</b>			
(a)	Discuss the properties and uses of Aluminium and Tin.	(06)	CO1	M5
(b)	Write short note on Soda lime Glass.	(04)	CO2	M5
(c)	What are the factors which influence the strength of concrete?	(06)	CO1	M3
(d)	Differentiate plywood and particle board with respect to strength, durability.	(04)	CO1	M5
<b>Q7</b>	<b>Answer the following Questions</b>			
(a)	Explain the defects in timber with the help of neat sketch.	(05)	CO1	M5
(b)	write short notes on (i) Geo-textiles (ii) Varnishes	(05) (05)	CO1 CO1	M3 M6
(c)	Write short note on fibre reinforced plastic.	(05)	CO2	M5



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ODD Semester EXAM



Q. P. Code:

Duration: 3 Hrs

Program: Civil Engineering

Course Code : BTC 206

Max. Marks: 100

Class: B.Tech

Semester: III

Name of the Course: Building Construction

**Instructions:**

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4. Use Drawing sheet for only question no.3

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Re-Exam, June-2018



Max. Marks: 100

Class: S.Y.B.Tech.

Semester: III

Name of the Course: Surveying-I

Q. P. Code:

Duration: 3 hour

Program: Civil

Course Code : BTC- 202

**Instructions:**

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

Question No		Maximum Marks	Course Outcome Number	Mod. No.
Q1	(a) Explain with neat sketch Zero circle.	05	C.O.1	5
	(b) Explain the adjustment of vertical axis of Theodolite.	05	C.O.3	6
	(c) Explain with neat sketch use of optical square.	05	C.O.1	1
	(d) Explain Fly Levelling with its suitability.	05	C.O.3	3
	(e) Differentiate between prismatic compass and surveyor compass.	05	C.O.1	2
	(f) Explain the term, contour, contour interval, Grade contour and horizontal equivalent.	05	C.O.1	4
Q2	(a) What is reciprocal levelling? Derive an expression for the same.	10	C.O.1	3
	(b) Calculate the area of zero circle from following: Length of anchor arm = 14.91 cm; Length of tracing arm = 12.35 cm; Distance between pivot and wheel = 3 cm, Assume when the wheel is outside the pivot and tracing point.	05	C.O.1	5
	(c) Classify the survey based on the instruments used?	05	C.O.1	1
Q3	(a) What is local attraction? The fore bearing of the line AB in a regular pentagon taken in the clockwise manner is $37^\circ$ . Find bearing of all lines? Also determine true bearings if magnetic declination is $3^\circ 40' W$	10	C.O.2	2
	(b) Describe the method of block contouring in detail.	10	C.O.1	4

Q4	(a) A 20 M chain was found to be 8 cm long after chaining 1150 M. It was 12 cm long at the end of days work after chaining a total distance of 2400 M distance. If the chain was correct before commencement of work, find true distance.	06	C.O.2	1																															
	(b) Explain the step- by- step procedure for ranging of line using Theodolite.	06	C.O.1	6																															
	(c) Discuss with neat sketch arithmetic method of contour interpolation.	08	C.O.3	4																															
Q5	(a) Explain advantages and disadvantages of plane table survey.	06	C.O.1	7																															
	(b) How will you perform temporary adjustment of Theodolite?	04	C.O.1	6																															
	(c) The offset taken from a survey line to a boundary are given below. Find the area by Trapezoidal rule and Simpson's rule.	05	C.O.3	5																															
	<table border="1"> <tbody> <tr> <td>Chainage (m)</td> <td>0</td> <td>20</td> <td>40</td> <td>60</td> <td>80</td> <td>100</td> <td>120</td> </tr> <tr> <td>Offset (m)</td> <td>3.19</td> <td>4.62</td> <td>3.88</td> <td>3.57</td> <td>3.91</td> <td>4.22</td> <td>4.09</td> </tr> <tr> <td>Chainage (m)</td> <td>140</td> <td>160</td> <td>180</td> <td>200</td> <td>220</td> <td>240</td> <td></td> </tr> <tr> <td>Offset (m)</td> <td>5.12</td> <td>4.64</td> <td>3.92</td> <td>2.98</td> <td>3.14</td> <td>4.85</td> <td></td> </tr> </tbody> </table>	Chainage (m)	0	20	40	60	80	100	120	Offset (m)	3.19	4.62	3.88	3.57	3.91	4.22	4.09	Chainage (m)	140	160	180	200	220	240		Offset (m)	5.12	4.64	3.92	2.98	3.14	4.85		05	C.O.2
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Q6	(d) How will you calculate volume from spot levels?	05	C.O.2	4																															
	(a) Rakesh was standing at station P observed magnetic bearing of Doordarshan Tower = $239^{\circ} 30'$ . Also he observed the bearing of electric pole = $142^{\circ}$ . If the Magnetic declination at place was $2^{\circ} 20'E$ , find the true bearing of both the lines.	06	C.O.3	2																															
	(b) What are different types of chains used for measuring distances?	04	C.O.1	1																															
Q6	(c) The following consecutive readings were taken with a level and 4 M levelling staff on a continuously sloping ground 0.835, 1.525, 2.345, 3.225, 3.785, 0.385, 1.435, 2.565, 2.875, 0.485, 1.015, 1.385, 2.635 3.460. The first reading was taken on a BM of 110.480 m. Rule out a page of level book and enters the above readings and Calculate R.L. of all points. Also check the accuracy of calculations.	10	C.O.3	3																															
	Q7	(a) During a Theodolite survey the following details were observed. Prepare gales table and balance it using Bowditch rule.	10	C.O.2	6																														
<table border="1"> <thead> <tr> <th>Line</th> <th>AB</th> <th>BC</th> <th>CD</th> <th>DE</th> <th>EA</th> </tr> </thead> <tbody> <tr> <td>Length</td> <td>280</td> <td>170</td> <td>160</td> <td>137</td> <td>165</td> </tr> <tr> <td>Bearing</td> <td><math>63^{\circ}</math></td> <td><math>135^{\circ}</math></td> <td><math>225^{\circ}</math></td> <td><math>248^{\circ}</math></td> <td><math>334^{\circ}</math></td> </tr> </tbody> </table>		Line	AB	BC	CD	DE	EA	Length	280	170	160	137	165	Bearing	$63^{\circ}$	$135^{\circ}$	$225^{\circ}$	$248^{\circ}$	$334^{\circ}$																
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(b) Write short notes on <u>any two</u> from the following:																																			
(i) Reciprocal ranging	5	C.O.1	1																																
(ii) Declination	5	C.O.2	2																																
(iii) Bench marks	5	C.O.1	3																																
(iv) Errors in plane table survey	5	C.O.3	7																																



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KT Examination

June 2018

Maximum Marks: 100

Duration: 3 hour

Class: S.Y.B.Tech

Semester: III

Program: Civil Engineering

Name of the Course: <sup>Sugg</sup> Applied Mathematics III

Course Code :BTC201

### Instructions:

- Attempt any FOUR questions out of remaining SIX questions.
- Question number.1 is **compulsory**.
- Answers to all sub questions should be **grouped** together.

Q		Marks	CO	Module No.
1(a)	Find the characteristic equation of the matrix A. $A = \begin{bmatrix} 4 & 3 & -1 \\ 2 & 1 & -2 \\ 1 & 2 & 1 \end{bmatrix}$ Hence find $A^{-1}$	5	4	7
(b)	Find Laplace transforms of $f(t) = \sin^4 t$	5	1	1
(c)	Find a Fourier series to represent, $f(x) = \pi - x$ for $0 < x < 2\pi$ .	5	2	4
(d)	Show that the function $u(x, y) = 4xy - 3x + 2$ is harmonic. Construct the corresponding analytic function $f(z) = u(x, y) + iv(x, y)$	5	3	5
2(a)	Find the eigen values and the corresponding eigenvectors of the following matrix $\begin{bmatrix} 2 & 0 & 1 \\ 0 & 3 & 0 \\ 1 & 0 & 2 \end{bmatrix}$	6	4	7

(b)	Prove that $\int_0^{\infty} \frac{e^{-t} \sin^2 t}{t} dt = \frac{1}{4} \log 5$	6	1	2
(c)	Obtain the half range sine series for $f(x) = \begin{cases} \frac{2x}{3} & 0 \leq x \leq \frac{\pi}{3} \\ \frac{\pi-x}{3} & \frac{\pi}{3} \leq x \leq \pi \end{cases}$	8	2	5
3 (a)	Prove that the following function is analytic $f(z) = \cosh z$	6	3	5
(b)	Show that $A = \frac{1}{2} \begin{bmatrix} \sqrt{2} & -i\sqrt{2} & 0 \\ i\sqrt{2} & -\sqrt{2} & 0 \\ 0 & 0 & 2 \end{bmatrix}$ is unitary and hence find $A^{-1}$	6	4	7
(c)	Find $\mathcal{L} \left\{ \frac{d}{dt} \left( \frac{\sin t}{t} \right) \right\}$	8	1	1
4 (a)	Find the Fourier series corresponding to the function $f(x)$ defined in $(-2, 2)$ as follows $f(x) = 2$ in $-2 \leq x \leq 0$ $= x$ in $0 < x < 2$	6	2	4
4(b)	Find the Laplace transforms of $f(t)$ , where $f(t) = \begin{cases} t, & 0 < t < 4 \\ 5, & t > 4 \end{cases}$	6	1	1
4(c)	Find the image of the circle $ z-1 =1$ in the complex plane under the mapping $w = \frac{1}{z}$ .	8	3	5
5 (a)	Evaluate: $\mathcal{L}^{-1} \left\{ \frac{2s-1}{s^3+s} \right\}$	6	1	2

(b)	<p>If <math>A = \begin{bmatrix} 3 &amp; -3 &amp; 4 \\ 2 &amp; -3 &amp; 4 \\ 0 &amp; -1 &amp; 1 \end{bmatrix}</math>, Find two non singular matrices P and Q such that <math>PAQ = I</math>. Hence find <math>A^{-1}</math>.</p>	6	4	6
(c)	<p>Obtain the half range sine series for</p> $f(x) = \begin{cases} \frac{2x}{3} & 0 \leq x \leq \frac{\pi}{3} \\ \frac{\pi-x}{3} & \frac{\pi}{3} \leq x \leq \pi \end{cases}$	8	2	4
6(a)	<p>Evaluate: <math>\mathcal{L}^{-1} \left\{ \frac{s}{(s+1)(s^2+4)} \right\}</math></p>	6	1	2
(b)	<p>For what values of <math>\lambda</math> and <math>\mu</math> the equations</p> $\begin{aligned} x + y + z &= 6 \\ x + 2y + 3z &= 10 \\ x + 2y + \lambda z &= \mu \end{aligned}$ <p>Have</p> <ol style="list-style-type: none"> <li>No solution</li> <li>A unique solution</li> <li>Infinite number of solutions</li> </ol>	6	4	6
(c)	<p>Find the analytic function <math>f(z) = u + iv</math> such that</p> $u - v = e^x (\cos y - \sin y)$	8	3	5
7(a)	<p>Obtain complex form of the Fourier series of the function the</p> $f(x) = \begin{cases} 0 & -\pi \leq x \leq 0 \\ 1 & 0 \leq x \leq \pi \end{cases}$	6	2	4
(b)	<p>Evaluate: <math>\mathcal{L}^{-1} \left\{ \frac{3s+7}{4s^2-25} \right\}</math></p>	6	1	2
(c)	<p>Solve <math>\frac{dy}{dt} + 2y + \int_0^t y dt = \sin t</math></p> <p>Given <math>y(0) = 1</math></p>	8	1	2