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Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

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

RE EXAMINATION EXAMINATION

JUNE 2016

Max. Marks: 100 Duration: 3 Hrs

Class: Second Year B. Tech Semester: III Program: Civil Engineering

Name of the Course: Building Construction Course Code : BTC206

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	Define building and Discuss classification of building based on occupancy	10	CO1	1
	b	Describe the requirements of foundations. And explain the well foundations along with sketch.	10	CO3	2
2	a	Explain the following with the sketch i. Revolving door ii. Ventilators iii. Fasteners and fixtures for doors & windows	12	CO1	3
	b	Discuss dead shore and pit method of underpinning	8	CO2	6
3	a	**Describe with help of sketch different types of joints in stone masonry**	8	CO1	7
	b	**Differentiate stone masonry and Brick masonry**	8	CO1	5
	c	Discuss pointing along with the help of sketch	4	CO1	4

Q.No			Marks	Course Outcome Number	Module No
4	a	Discuss the provisions to be made for sound insulation in a building	6	CO1	2
	b	Discuss in detail pile foundations	10	CO1	3
	c	Briefly explain Air conditioning in building	4		6
5	a	Describe the methods of Damp proofing for foundation and flooring	8	CO2	6
	b	Explain the method of cement plastering and also discuss defects in plasters	12	CO1	2
6	a	Discuss the concept of green building and advantages of it.	6	CO1	7
	b	Enlist different types of windows and explain any three with the help of sketch	14	CO1	3
7	a	Discuss Madrass and Punjab Terrace roof with the help of sketch	10	CO1	4
	c	What is scaffolding? Enlist different types of Scaffolding and give details of components parts of scaffolding	10	CO1	5

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

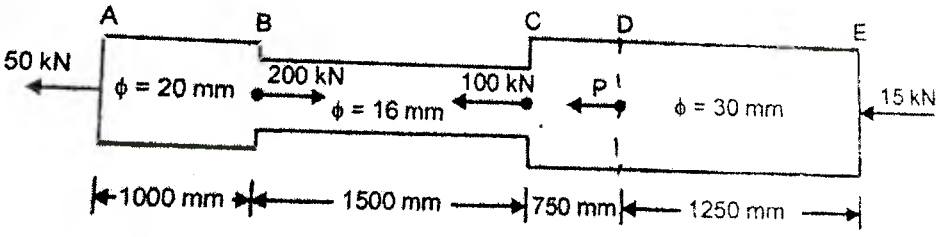
STRENGTH OF MATERIALS

Duration : 3 Hours | **(100 MARKS)** | SE (CIVIL) SEM III

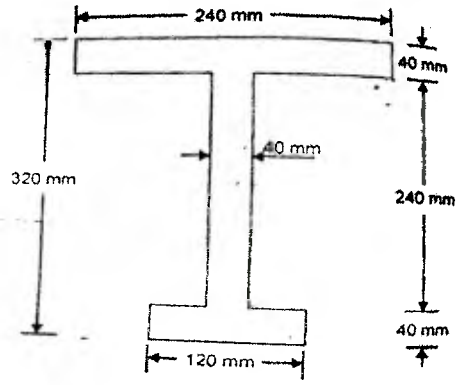
- Attempt any FIVE questions.
- Assume any other data needed suitably if not given; but justify the same.
- Illustrate your answers with neat sketches wherever required, though not sought specifically.

Q1.a. 10

A member ABCDE of varying circular cross-section is subjected to axial loads at different locations as shown in fig. Determine a) the force P for the equlibrium of the member b) the total change in the length of the member. Take E = 2 x 10^5 N / mm^2



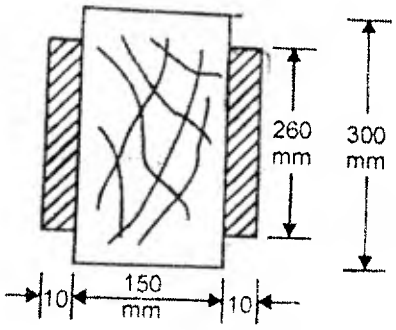
b. A cast iron bracket subjected to bending has a c/s of I shape with unequal flanges. If the section is subjected to shear force of 120 KN, draw shear stress distribution diagram over the depth of the section. 10



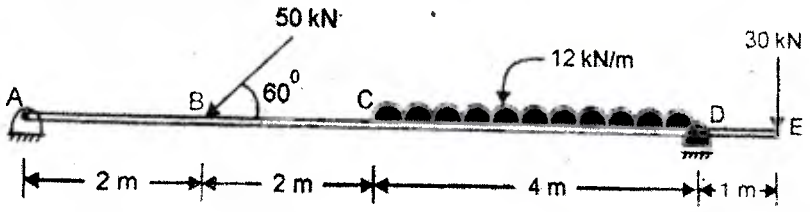
Q2.a. A point in a strained material is subjected to mutually perpendicular stresses of 8000 N/cm2 tensile and 5000 N/cm2 compressive. It is also subjected to a shear stress of 1500 N/cm2. Find out the principal stresses and the maximum shear. Also the angle made by the planes carrying principal stresses and maximum shear with respect to 8000 N/cm2 stress plane. 12

b. Find the maximum and minimum stress intensities at the base of a uniform circular chimney, having external and internal diameters as 5m and 3m. The height of the chimney is 25m and it is subjected to wind pressure of 1.5 KN/m^2. The density of masonry may be taken as 21 KN/m^3. 8

Q3.a. A flichted beam consists of wooden joist and two steel plates placed on either sides of the joist as shown. If the permissible stress in wood and steel are not to exceed 800 N/mm2 and 12000 N/mm2 respectively, find the moment of resistance of the section. Take $E_S = 18\ E_W$ 8



b. Draw A.F.D., S.F.D. and B.M.D. for the loaded beam shown. 12



Q4.a. Derive the relation between E - G, E - K and E,G and K. 15

b. Explain the theory of Simple Bending. 5

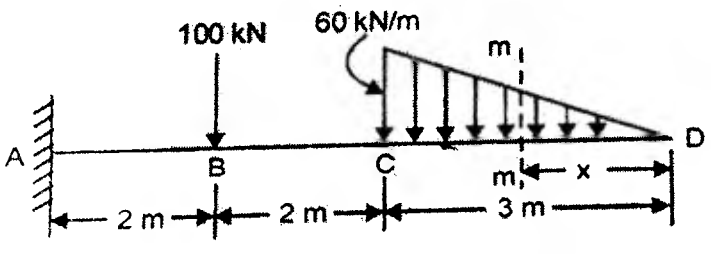
Q5.a. A cylindrical shell one metre in diameter and 3m long has a metal thickness of 10mm. If it is subjected to an initial pressure of 3 N/mm2 , determine ΔL, Δd and Δv. 10

b. A wooden plank is 40 cm wide and 8 cm thick is used to bridge a gap 5 m long. A man weighing 750N is standing at the middle of the plank. Calculate maximum bending stress in the plank. i) When the plank is layed flat. Ii) When the plank is placed on one edge. 10

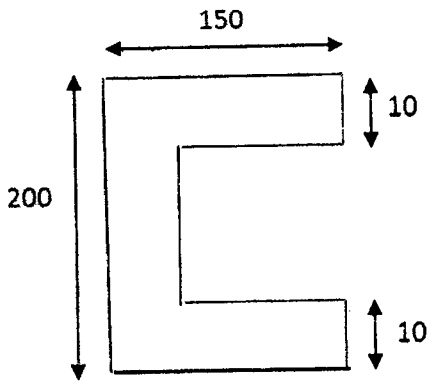
Q6.a. A hollow steel shaft is running at 180 RPM and transmits 1600 KW power.Determine the shear stress at the outer and inner radii of the shaft, if the internal and external diameter of the shaft are 125 mm and 200 mm respectively. 12

b. Derive and draw shear stress diagram for Standard Rectangular section. 8

Q7.a. Draw S.F.D and B.M.D. for the cantilever beam shown. 10



b. Locate shear centre for the given section. 10



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Sardar Patel College of Engineering

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

End Semester Re-Exam, June-2016

Q. P. Code:
Duration: 3 hour
Program: Civil
Course Code : **BTC- 202**

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

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		Max. Marks	Course Outcome Number	Module No.
Q1	Explain the following terms: (a) Balancing of Sight. (b) Grade contour (c) Zero circle (d) Bowditch rule (e) Testing of Chain	 **04** **04** **04** **04** **04**	 C.O.1 C.O.1 C.O.2 C.O.1 C.O.1	 3 4 5 6 1
Q2	**a)** A closed traverse PQRSTP was run using prismatic compass to collect field details. Detect local attraction at all the stations and find the correct included angles. Also eliminate the local attraction by applying suitable corrections and find corrected bearings. Line / Fore bearing / Back Bearing PQ / 70° 30' / 251° 30' QR / 130° 00' / 309° 00' RS / 196° 30' / 18° 00' ST / 204° 30' / 24° 00' TP / 342° 30' / 160° 30' **b)** Explain the Radiation method of plane Tabling.	**12** **08**	C.O.1 C.O.1	2 7
Q3	**(a)** Following readings were observed during fly levelling. Rule out a page of field book and apply necessary checks using rise and fall method. **B.S.:1.215 (BM, RL= 163.45m), 0.980, 1.635, 2.705, 0.940** **F.S.: 3.810, 2.415, 0.915, 1.345, 1.665** **(b)** Discuss field work required in chain surveying.	**10** **06**	C.O.1 C.O.2	3 1

<table>
<tr><td></td><td>(c) Explain with neat sketch open cross staff.</td><td>04</td><td>C.O.1</td><td>1</td></tr>
<tr><td>Q4</td><td>(a) A traverse ABCDEFA was run using digital Theodolite. Balance the traverse using Bowditch rule. Also calculate independent co-ordinates.
<table>
<tr><th>Line</th><th>Length m</th><th>corrected WCB</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>AB</td><td>13.88</td><td>80° 24' 07"</td></tr>
<tr><td>BC</td><td>18.19</td><td>44° 57' 42"</td></tr>
<tr><td>CD</td><td>12.70</td><td>80° 55' 28"</td></tr>
<tr><td>DE</td><td>13.12</td><td>9° 17' 28"</td></tr>
<tr><td>EF</td><td>39.40</td><td>271° 4' 46"</td></tr>
<tr><td>FA</td><td>30.80</td><td>183° 9' 4"</td></tr>
</table>
(b) Derive an expression for the sensitivity of bubble tube.</td><td>12

08</td><td>C.O.1

C.O.3</td><td>6

4</td></tr>
<tr><td>Q5</td><td>(a) Explain graphical method of interpolating contours.
(b) A line AB of 4650 m long was measured with a steel tape which was exactly 30 meters at 30°C and at a pull of 90 N. The temperature during measurement was 45°C and pull applied was 170 N. Find the correct length of line. Assume α = 4.2 x 10^{-6} per 1°C, A= 2.5 mm^2, E= 2.1 x 10^5 N/mm^2.
(c) Explain with neat sketch (i) A pond (ii) A valley.
(d) The readings from a planimeter were the following: initial reading = 11.246, final reading = 5.235, the zero crossed the index twice in the clockwise direction. The anchor point was kept inside the areas and the constant were M= 100.5 sq. cm. and C=30. Find the area of the plan.</td><td>06
05

04
05</td><td>C.O.1
C.O.1

C.O.1
C.O.2</td><td>3
1

3
5</td></tr>
<tr><td>Q6</td><td>(a) How will you make use of Theodolite as level instrument?
(b) Explain in detail the procedure for balancing of traverse.
(c) The offset taken from a survey line to a boundary are given below. Find the area by Trapezoidal rule and Simpson's rule.
<table>
<tr><td>Chainage (m)</td><td>0</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td></tr>
<tr><td>Offset (m)</td><td>3.6</td><td>4.9</td><td>6.8</td><td>7.2</td><td>5.1</td><td>2.9</td><td>4.7</td></tr>
</table></td><td>05
10

05</td><td>C.O.1
C.O.1

C.O.3</td><td>6
6

5</td></tr>
<tr><td>Q7</td><td>Write short notes on
(i) Auto level
(ii) Line Ranger
(iii) Local attraction
(iv) Capacity of reservoir using contour</td><td>05
05
05
05</td><td>C.O.1
C.O.1
C.O.1
C.O.1</td><td>4
1
2
3</td></tr>
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Sardar Patel College of Engineering

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Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Re-Examination
May 2016

Max. Marks: 100 Duration: 03 hours
Class: S.Y.Btech Semester: III Program:Civil
NameoftheCourse:EngineeringMathematics-III
CourseCode : BTC201

Instructions:
1) Answers to sub questions are to be grouped together otherwise **NO MARKS WILL BE AWARDED.**
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and draw proper figures where ever required.
4) Answer the questions in detail.
5) Attempt any five out of seven questions.

Master file.

Q No.		Max marks	Course outcome	Module number
Q1a)	Evaluate $L\{(t+2)^2 e^t\}$	6	1	1
b)	Obtain the Fourier Series for $f(x)=x$ in $(0,2\pi)$	6	3	3
c)	Verify Green's theorem in the plane for $\oint_c (3x^2-8y^2)dx+(4y-6xy)dy$ where C is the boundary of region defined by $x=0, y=0$ & $x+y=1$.	8	4	7
Q2 a)	Find Fourier series of $f(x)=\lvert x\rvert \quad -2<x<2$	6	3	3
b)	If $A=\begin{pmatrix}-1 & -2 & 3\\ -2 & 1 & 1\\ 4 & -5 & 2\end{pmatrix}$ then verify $A(adjA)=(adjA)A=\lvert A\rvert I$	6	2	5
c)	Prove that $\int_0^\infty e^{-2t}\sin^3 t\,dt=\frac{6}{65}$	8	1	1
Q3 a)	Obtain the Fourier series for $f(x)=\begin{cases}1+\frac{2x}{\pi} & -\pi<x<0\\ 1-\frac{2x}{\pi} & 0<x<\pi\end{cases}$	6	3	3

b)	Evaluate $L^{-1}\left\{\frac{3s+7}{s^2-2s-3}\right\}$	6	1	2
c)	Prove that $\nabla\left(r^2e^r\right)=(r+2)e^r\vec{r}$	8	4	7
Q4 a)	Find the rank by reducing to normal form $A=\begin{pmatrix}2&3&-1&-1\\1&-1&-2&-4\\3&1&3&-2\\6&3&0&-7\end{pmatrix}$	6	2	5
b)	Calculate the angle between the normal to the surface $xy=z^2$ at the points $(4,1,2)$ and $(3,3,-3)$	6	4	7
c)	If $f(x)=\sin x \qquad 0\le x\le\pi$ Find half range cosine series	8	3	3
Q5 a)	If $f(x)=x \qquad 0\le x\le 2$ Find half range cosine series using Parseval's identity deduce $\frac{\pi^4}{96}=\frac{1}{1^4}+\frac{1}{3^4}+\frac{1}{5^4}+------$	6	3	4
b)	If $A=\frac{1}{3}\begin{pmatrix}-2&1&2\\2&2&1\\1&-2&2\end{pmatrix}$ prove that A is orthogonal and hence find A^{-1}	6	2	5
c)	Solve using Laplace transforms $y''+y=t$ Given $y(0)=1 \quad y'(0)=-2$	8	1	2
Q6 a)	Show that $\{\sin(2n+1)x\}$ is orthogonal on $\left[0,\frac{\pi}{2}\right]$ and construct corresponding orthonormal set of functions.	6	3	4
b)	Evaluate $L^{-1}\left\{\log\left(1+\frac{1}{s^2}\right)\right\}$	6	1	2
c)	Find all the eigen values and eigenvectors of the matrix $A=\begin{bmatrix}-2&2&-3\\2&1&-6\\-1&-2&0\end{bmatrix}$	8	4	6
Q 7 a)	Solve using convolution theorem $L^{-1}\left\{\frac{s}{(s^2+4)(s^2+1)}\right\}$	6	1	2
b)	Test for consistency and solve	6	1	6

	$5x+3y+7z=4$ $3x+26y+2z=9$ $7x+2y+10z=5$			
c)	Verify Divergence Theorem for $\vec{F}=(x^2-yz)\hat{i}+(y^2-zx)\hat{j}+(z^2-xy)\hat{k}$ taken over the rectangular parallelepiped $0 \le x \le 1, 0 \le y \le 1, 0 \le z \le 1$.	8	4	7