Hall Ticket Number :										

R-11 / R-13

Code: 1GC31

II B.Tech. I Semester Supplementary Examinations May 2019

Mathematics-II

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks** each)

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1. a) Given the matrix $A=\begin{bmatrix}1 & 7 & 5\\ 0 & 2 & 9\\ 0 & 0 & 5\end{bmatrix}$, find the Eigen values and Eigen vectors. Prove that the sum of Eigen values is Trace of matrix A and Product of Eigen values is $|A|$.

   b) Show that the Eigen values of Diagonal matrix are diagonal elements of the Matrix.

2. Obtain the Fourier series for $f(x)=\left(\frac{® - x}{2}\right)^2$ in $0<x<2®$

3. a) Form a partial differential equation by eliminating the arbitrary constants $2z=\frac{x^2}{a^2}+\frac{y^2}{b^2}$.

   b) Form a partial differential equation by eliminating the arbitrary function from $z=f\left(x^2-y^2\right)$.

4. Find a real root of the equation $3x=\cos x+1$ by Newton-Raphson's method correct to four decimal places.

5. Using Taylor's series method, compute the value of y at x=0.2 and x=0.4 from $\frac{dy}{dx}=x+y;\ y(0)=1$.

6. From the following table of values of 'x' and 'y', obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x=1.5

X	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.0	13.625	24.0	38.875	59.0

7. Show that the function $f(z)=\sqrt{|xy|}$ is not analytic at the origin although the Cauchy Riemann equations are satisfied at the origin.

8. Expand $f(z)=\frac{1}{(z-1)(z-2)}$ in the region $(i):|z|<1$ $(ii):1<|z|<2$ $(iii):|z|>2$ $(iv):0<|z-1|<1$

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Hall Ticket Number :										

R-11 / R-13

Code: 1G631

II B.Tech. I Semester Supplementary Examinations May 2019

Strength of Materials-I

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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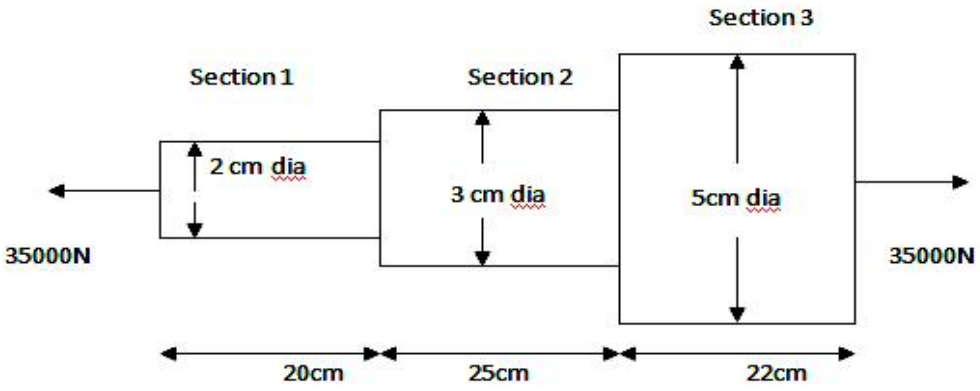
1. An axial pull of 35000N is acting on a bar consisting of three lengths as shown in figure. If the Young's modulus is $2x10^5$ N/mm^2 , Determine
(i) Stresses in each section and (ii) Total extension of bar.



2. A Simply supported beam of length 8m, carries a point load of 3KN and 6KN at a distance of 2m and 6m from the left end. Draw the Shear Force and Bending Moment Diagrams.

3. Determine the maximum stress induced in a cast iron pipe of external diameter 50mm, internal diameter 30mm and of length 5m, when the pipe is supported at its ends and carries a point load of 8KN.

4. A simply supported wooden beam of span 1.3m having a cross section 190mm wide and 290mm deep carries a point load "W" at the center. The permissible stresses are 8 N/mm^2 in bending and 1 N/mm^2 in shearing. Calculate the safe load "W".

5. Determine the maximum deflection of a simply supported beam with a uniformly distributed load by using Double integration method.

6. Determine deflection of a cantilever beam with a point load at the free end by using Double integration method.

7. Find the diameter of a circular bar which is subjected to an axial pull of 160KN if the maximum allowable shear stress on any section is 85 N/mm^2.

8. Explain briefly about various types of theories of failures.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G632

II B.Tech. I Semester Supplementary Examinations May 2019

Surveying

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks** each)

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1. a) Define Surveying. Explain its importance for civil Engineers.
   b) List out the instruments for chaining and explain briefly?

2. a) Explain the sources of errors in compass surveying and what precautions are to be taken to eliminate them?
   b) Differentiate between whole circle bearing and Quadrantal bearing

3. a) Explain briefly, the uses of contour maps.
   b) The following readings were taken with a level in sequence as follows: 1.585, 1.315, 2.305, 1.225, 1.325, 1.065, 1.815 and 2.325The level was shifted after the third and sixth readings. The second change point was a bench mark of elevation 150.375m. Find the reduced levels of the remaining stations. Use the rise and fall method.

4. Draw the sketch of a two level section, and derive an expression for the area of cross section.

5. a) Explain briefly the temporary adjustments of theodolite
   b) List out the fundamental lines of a theodolite? Write the desired relationship between them.

6. Derive an expression for the horizontal distance of a vertical staff from a tacheometer, if the line of sight is inclined.

7. Define the following terms:
   a) Point of Curvature
   b) Point of Tangency
   c) Mid-ordinate
   d) Apex Distance.

8. a) Define Geodetic surveying? How it is different from plane surveying.
   b) Explain the basic principle of Electronic Distance Measurements

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Hall Ticket Number :										

R-11 / R-13

Code: 1G633

II B.Tech. I Semester Supplementary Examinations May 2019

Fluid Mechanics

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks** each)

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1. a) Define and derive Pascal's law

   b) A hydraulic press has a ram of 30cm diameter and a plunger of 5cm diameter. Find the weight lifted by the hydraulic press when the force applied at the plunger is 400N?

2. a) Derive an expression for total pressure for a vertical plane surface submerged in liquid.

   b) A circular plate 3 m diameter is immersed in water in such a way that its greatest and least depth below the free surface is 4 m and 1.5 m respectively. Determine the total pressure on one face of the plate and position of the centre of pressure.

3. a) Define uniform and non-uniform; laminar and turbulent flows

   b) Define and distinguish between stream line, path line and streak line.

4. a) Derive the Euler's equation for steady flow along a stream

   b) Define the terms Kinetic energy correction factor and momentum correction factor.

5. a) Explain the term coefficient of friction. On what factors does this co-efficient depends?

   b) Derive an expression for the loss of head due to i) sudden expansion, ii) sudden contraction of a pipe.

6. Find the discharge of water flowing through a pipe of 20cm diameter placed in an inclined position, where a venture meter is inserted, having a throat dia of 10cm. The difference of pressure between the main and throat is measured by a liquid of specific gravity 0.4 in an inverted U-tube, which gives a reading of 30cm. The loss of head between main and throat is 0.2 times the kinetic head of pipe.

7. Derive equation for the velocity distribution for viscous flow through a circular pipe, also sketch the velocity distribution and shear stress distribution across a section of the pipe.

8. The discharge through a weir is 1.5 m^3/s. Find the discharge through the model of the weir if the horizontal dimension of the model=1/40 the horizontal dimension of the prototype and vertical dimension of the model =1/8 the vertical dimension of the prototype.

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