Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Concrete Technology [CE401T]
Branch-Civil

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions. All question carry equal marks.

Q.1 (a) What do you understand by grade of concrete? Discuss with example.
(b) Differentiate between Mix design and nominal mix design of Concrete.

Q.2 (a) What do you understand by computer aided design of concrete mix?
(b) What do you understand by batching process for concrete production?

Q.3 (a) Write detail note on the Lights weight concrete and vacuum concrete?
(b) Explain the various types of admixtures and its various important function

Q.4 (a) Describe the classification of concrete with their advantages and disadvantages.
(b) What are stress and strain characteristics of concrete?

Q.5 (a) Describe various factors influencing mix design.
(b) What are various method of concrete mix design describe any one in detail?

Q.6 (a) Describe the batching of concrete through batching plant.
(b) Describe the repair technology used for concrete structure.

Q.7 (a) What are the polymer concrete composites? Describe any type in details
(b) What is Ready mix concrete? Write down its various characteristics.
(c) Describe segregation and bleeding of concrete.

Q.8 (a) What is Prestressed Concrete? Write its properties.
(b) Explain different non-destructive testing of concrete
(c) Explain the significance of statistical quality control of concrete.

Enrollment No…….

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Water Supply & Waste Water Engineering-I [CE402T]
Branch-Civil

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions. All questions carry equal marks.

Q.1 (a) Discuss "Logistic curve method" for forecasting population.
(b) What do you understand by water demand? Explain "Per capita Demand".

Q.2 (a)Write down the various formulae used for calculating fire demand.
(b) In two periods each of 20 years a city has grown from 40000 to 160000 and then 280000. Determine the saturation population and the expected population after the next 20 years.

Q.3 (a) What are intakes? What are important factors which govern the selection of site of an intake?
(b) What are the common impurities found in natural sources of water? Explain their effects upon its quality

Q.4 (a) Why are pressure pipes most commonly used for conveying water from distant surfaces to the town of supply.
(b)State the comparative merits and demerits of steel and concrete material used in conveyance of water.

Q.5 (a)How you can detect and prevent losses in water supply distribution system.
(b)Explain graphical method of calculating capacity and height of a service reservoir.

Q.6 (a) Enlist various valves and appurtenances used in a water supply scheme.
(b) Explain the analysis of series and parallel network of pipe with appropriate example.

Q.7 (a)Which type of force is predominant in case of design of sewer pipes? Explain.
(b) Distinguish between fresh sewage, stale sewage and septic sewage

Q.8 (a)Describe various shapes of sewer with their merits and demerits.
(b)Describe the fluctuation per day in flow of sewage of a city. What are its effects on the design of sewer?

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Structural Analysis-I [CE403T]
Branch- Civil

Time: 3:00 Hrs **Max Marks 70**

Note: (i) Attempt any five questions. All question carry equal marks.
(ii) Assume suitable data if necessary & state them clearly.

Q.1 (a) What are the different types of strain energy stored in the structure?
(b) State the Maxwell theory of reciprocal deflection?

Q.2 (a) Define kinematic indeterminacy? Find the degree kinematic indeterminacy of propped cantilever beam?
(b) What do you understand by influence line diagram? State the significance of ILD in the analysis of structure?

Q.3 (a) Define absolute maximum shear force and absolute maximum Bending moment in case of rolling/moving loads?
(b) Define the carry over factor and distribution factor for prismatic beam?

Q.4 (a) Explain eddys theorem for arches?
(b) Differentiate two hinge arch and three hinge arch?.

Q.5 (a) Explain the slope deflection method for analysis of sway frames?
(b) A two hinge parabolic arch has span of 20m and rise of 5m and caries a UDL of 20KN/m for distance of 5m from left end as shown in fig7 determine i.The hoprizontal thrust at each support and ii. Bending moment normal thrust and radial shear at the section of arch 5m from the left hand?

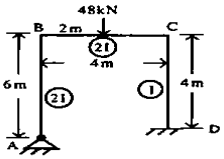


Figure 5

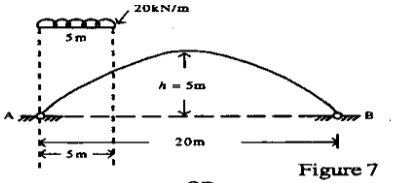
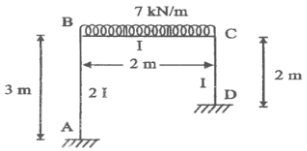


Figure 7

Q.6 (a) Analyse the portal frame in fig5 by using slope deflection method draw BM diagram?

(b) Analysis the frame shown in fig below by moment distribution method.Draw the Bending Moment diagram and sketch the deflected shape of the frame?



Q.7 (a) Draw the bending moment and sketch the deflected shape of the frame shown in fig. by using moment distribution method the ends A and D are fixed.

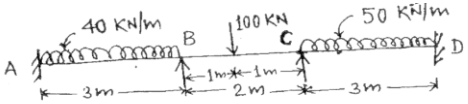


Figure 2

(b) How the influence line can be drawn quantitatively for determinate and indeterminate structure? Explain.

Q.8 (a) State the condition for maximum bending moment under any given wheel load?

(b).Define U.D.L. and find U.D.L. for B.M. for single point load with assume data?

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Structural Mechanics [CE404T]
Branch-Civil

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions. All questions carry equal marks.

Q.1 (a) What is slenderness ratio? Write down the classification of column based on it.
(b) What is euler's theory of long columns? Explain it with its various assumptions.

Q.2 (a) Describe Euler's formula for crippling load for a column which one end is fixed and other end hinged.
(b) Discuss rankines hypothesis used for columns

Q.3 (a) Explain parallel axis theorem for product of inertia.
(b) Drive an expression to calculate deflection of beams due to unsymmetrical bending.

Q.4 (a) What is shear Centre write its characteristics
(b) Determine the location of shear Centre for unequal I section.

Q.5 (a) Explain the working of springs in series and parallel combination.
(b) What is unsymmetrical bending why it is taken place explain with suitable example.

Q.6 (a) What are the various theories of failure in beam & column? Explain maximum principal stress theory.
(b) Discuss Strain energy theory of failure explain in detail.

Q.7 (a) Derive an expression for stress induced due to falling or impact load.
(b) Discuss castigliano's theorem in detail give the formula for deflection under axial load bending Torsion and shear.

Q.8 (a) Write a short note on maxwell's reciprocal theorem.
(b)What is chaperons theorem give its expression.

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Fluid Mechanics [CE405T]
Branch-Civil

Time: 3:00 Hrs **Max Marks 70**

Note : (i) Attempt any five questions.
(ii) All question carry equal marks.

Q.1 (a) Expalin Newton's Law of Visocity?
(b) What are the type of Fluids?

Q.2 (a) State the Pascal's Law & its Application?
(b) Distinguish Between Steady Flow and Unsteady Flow?

Q.3 (a) State the Bernoulli's Equation of fluid flow? Find the Kinematic Visocity of an oil having Density 981kg/m^3. The Shear Stress at a Point in oil is 0.2452N/m^2 and Velocity Gradient at that Point is 0.2 per second?
(b) The Velocity distribution for flow over a flat plate is given by $u=3/4\ y-y^2$ in which u is the velocity in metre per second at a distance y metre above the plate. Determine the shear Stress at y=0.15m. Take a dynamic Visocity of fluid as 8.6 poise? by Chezy's Formula?

Q.4 (a) Find the Velocity of Flow and rate of flow of Water through a rectangular channel of 6m wide and 3m deep, when it is Running full. the channel is having bed as 1 in 2000. Take chezy's Constant c=55
(b) Find the discharge through a retangular channel of width 2m having a bed slope of 4 in 8000. the Depth of flow is 1.5m and take the value of N in Manning's formula as 0.012?

Q.5 (a) The pressure outside the Droplet of water of Diameter 0.04m is 10.32N/cm^2 (Atmospheric Pressure). Calculate the pressure within the droplet if surface Tension is Given as 0.0725N/m of water?
(b) Explain Kinematic Visocity?

Q.6 (a) What are the properties of Fluid? Explain one, Two and Three-dimensional Flow?

(b) A plate 0.025mm Distant from a fixed plate moves at 60cm/s and Requires a force of 2N per unit Area i.e. $2N/m^2$ to maintain this Speed. Determines the fluid Visocity Between the Plates?

Q.7 (a) What is Continuity Equation? Explain Rate of Flow or Discharge (Q)?

(b) Explain the terms Meta-Centre & Metacentric Height? Explain Manometers?

Q.8 (a) Explain Mechanical Guages and Simple Manometers?

(b) Determine the total Pressure on a circular Plate of diameter 1.5m which is placed Vertically in water in Such a way that the centre of the plate is below the free surface of Water. Find the position of Centre of Pressure also?

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Mathematics-III [MA220T]
Branch-CE/ME

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions out of eight.
All question carry equal marks.

Q.1 (a) State and prove Cauchy's theorem.
(b) Show that the function $e^x(cosy + isiny)$ is analytic and find its derivative.

Q.2 (a) Using Cauchy's integral formula prove that : $\int_c^3 \frac{e^{2z}}{(z+1)^4} dz = \frac{8\pi e^{-2}}{3} i$, where C is the circle $|z| = 3$.
(b) Find the imaginary part of the analytic function whose real part is $x^3 - 3xy^2 + 3x^2 - 3y^2$.

Q.3 (a) Find the real root of the equations $x^3 - 9x + 1 = 0$ by the method of false position.
(b) Apply Newton Raphson method to solve $3x = cosx + 1$.

Q.4 (a) Using Newton's forward Interpolation formula, find the value of $f(1.6)$,if

x:	1	1.4	1.8	2.2
y:	3.49	4.82	5.96	6.5

(b) Solve the following system by Gauss elimination method

$$6x_1 + 3x_2 + 2x_3 = 6$$
$$6x_1 + 4x_2 + 3x_3 = 0$$
$$20x_1 + 15x_2 + 12x_3 = 0$$

Q.5 (a) Apply Lagrange's formula to find the value of x when f(x) = 0 given that

x:	30	34	38	42
$f(x)$:	−30	−13	3	18

(b) Solve initial value problem $\frac{dy}{dx} = 1 + xy^2$, $y(0)$=1 for $x = 0.4$, 0.5 by using Milne's method when it is given that

x:	0.1	0.2	0.3
y:	1.105	1.223	1.355

Q.6 (a) Solve the equation $\frac{dy}{dx} = x + y$ with initial condition $y(0) = 1$ by Runge kutta rule from $x = 0$ to $x = 0.4$ with $h = 0.1$

(b) Evaluate $\int_{0.5}^{0.7} x^{1/2} e^{-x} dx$ approximately by using a suitable formula.

Q.7 (a) Solve the following by Euler's modified method, the equation $\frac{dy}{dx} + \log(x + y), y(0) = 2$ at $x = 1.2$ and 1.4 with $h = 0.2$

(b) Use picard's method to approximate y when $x = 0.2$ given that $y = 1$ when $x = 0$ and $\frac{dy}{dx} = x - y$

Q.8 (a) Solve the following by Euler's modified method, the equation $\frac{dy}{dx} + \log(x + y), y(0) = 2$ at $x = 1.2$ and 1.4 with $h = 0.2$

(b) Solve the following by Gauss Seidel iteration Method

$$10x + y + z = 12$$

$$2x + 10y + z = 13$$

$$2x + 2y + 10z = 14$$