(DCE 211)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - I : Mathematics - III

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) Answer the following questions:

a) What is the form of Fourier series for $f(x)$ in $-\pi < x < \pi$.

b) Define periodic function.

c) Find the value of a_o in the Fourier Series to represent $x - x^2$ from $x = -\pi$ to $x = \pi$.

d) Define odd function and give an example.

e) Write any two properties of Fourier transform.

f) Define Fourier cosine transform.

g) Define Fourier transform.

h) Define shift operator E.

i) Show that E = 1+Δ.

j) Define interpolation.

k) State Stirling's interpolation formula.

l) Write the Lagrange's interpolation formula.

m) Define numerical differentiation.

n) Write Trapezoidal rule.

o) Write Simpson's $\frac{1}{3}$ rule.

UNIT - I

2) a) Obtain the Fourier series for the function $f(x) = x^2$, in the interval $(-\pi, \pi)$ and from it deduce the result $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots = \frac{\pi^2}{12}$.

b) Obtain the Fourier series for the function $f(x)$ given by

$f(x) = -x + 1, \quad -\pi < x < 0$

$= x + 1, \quad 0 < x < \pi$

Deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{8}$.

OR

c) Find the Fourier series for $f(x) = e^{-x}$ in the interval $0 < x < 2\pi$.

d) Obtain the Fourier expansion of $x \sin x$ as a cosine series in $(0, \pi)$.

UNIT - II

3) a) Find the Fourier Cosine transform of $f(x) = \frac{1}{1+x^2}$. Hence derive Fourier sine transform of $\phi(x) = \frac{x}{1+x^2}$.

b) Find the complex form of Fourier series for the function $f(x) = e^{ax}, -l < x < l$.

OR

c) Obtain the constant term and the coefficients of the first sine and cosine terms in the Fourier expansion of y as given in the following table:

x :	0	1	2	3	4	5
y :	9	18	24	28	26	20

d) Find the Fourier sine transform of $e^{-|x|}$.

UNIT - III

4) a) Using Newton-Raphson method, find as root of the equation $x \sin x + \cos x = 0$ which is near $x = \pi$.

b) Using Newton's forward formula, find the value of $f(1.6)$ if

x:	1	2	3	4
$f(x)$:	3.49	4.82	5.96	6.5

OR

c) The pressure P of wind corresponding to velocity v is given by the following data. Estimate P when $v = 25$.

v :	10	20	30	40
P:	1.1	2	4.4	7.9

d) Use Stirling's formula to evaluate $f(1.22)$, given

x :	1.0	1.1	1.2	1.3	1.4
$f(x)$:	0.84	0.89	0.93	0.96	0.98

UNIT - IV

5) a) Given $y_0 = -12, y_1 = 0, y_3 = 6$ *and* $y_4 = 12$, find y_2 by using Lagrange's interpolation formula.

b) Find $y'(0)$ and $y''(0)$ from the following table:

x :	0	1	2	3	4	5
y:	4	8	15	7	6	2

OR

c) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using

i) Trapezoidal rule taking $h = 1/4$. ii) Simpson's 1/3 rule taking $h = 1/4$.

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(DCE 212)

B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - II : Building Materials And Construction

Time : 03 Hours **Maximum Marks : 75**

Answer Question No.1 is compulsory ***(15)***

Answer One question from each unit ***(4×15=60)***

1) a) List out any two important physical properties of a building material.

b) How are rocks chemically classified.

c) What are rock forming minerals.

d) Define natural bed of a stone.

e) Write any two qualities of a good building stone.

f) What are the constituents of good brick earth.

g) How is brick earth classified.

h) Enumerate the sources of lime.

i) Compare soft woods with hard woods.

j) State the various uses of steel.

k) What are the ingredients of a varnish.

l) Write the basic concept of foundation.

m) List out the types of bonds in brick work.

n) Write any two causes of dampness.

o) Write the different methods of under pinning? Generally considered now a days.

UNIT -I

2) a) What are the precautions to be taken while dressing a stone ? Explain

b) Explain in detail about manufacture of brick with sketch.

OR

3) a) Briefly describe the practical tests for limestones.

b) Describe the methods of slaking burnt lime.

UNIT -II

4) a) What are the advantages of wood based products.

b) Explain the different ways of classification of timber.

OR

5) a) Describe the various processes adopted to manufacture steel.

b) Discuss the important points to be noted before the process of painting is started.

UNIT -III

6) Write about the purpose of a footing and explain clearly about shallow and spread footing.

OR

7) a) What is the purpose of a cavity wall? Explain

b) Explain in detail about English bond with sketches.

UNIT –IV

8) a) Discuss briefly about various types of pitched roofs.

b) Write about flat roof and where it will be used in buildings.

OR

9) a) What is the purpose of a scaffolding.

b) What is the purpose of water proofing and what are the materials used for it?

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(DCE 213)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper – III : Surveying - I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is a tie line?

b) What is an agonic line?

c) What is magnetic declination?

d) What is a bearing?

e) What is a valley line?

f) What is a contour interval?

g) What is meant by swinging?

h) What is meant by topographical Surveying?

i) Define surveying.

j) What is the principal of surveying?

k) What is a fore bearing?

l) List out the factors that cause local attraction.

m) What is a horizontal equivalent?

n) What is a bench mark?

o) What is a contour gradient?

UNIT - I

2) a) What is a traverse? What are different types of traverses? Briefly explain the methods of traversing.

b) What are different methods of making linear measurements? Describe briefly.

OR

3) a) What considerations would you have while selecting survey stations and survey lines in a chain survey?

b) Write a short note on the marking of survey stations and referencing.

UNIT - II

4) a) State and Explain how chaining is used for the measurement of horizontal distance between two points on a sloping ground.

b) List out the method used to measure the horizontal angles by using a theodolite. Explain any one method in detail.

OR

5) a) Define the following terms associated with the angle measurements with a theodolite:

i) Vertical axis,

ii) Trunnion axis,

iii) Axis of plate level and

iv) Centering.

b) Describe various types of bearings.

UNIT - III

6) a) Describe briefly the use of various accessories of a plane table.

b) Distinguish between resection and intersection methods as applied to plane table surveying.

OR

7) a) Explain the difference between prismatic compass and surveyor's compass.

b) The fore bearings and back bearings of the lines of a closed traverse are as follows correct the bearings for local attraction.

Side	F.B	B.B.
AB	32º30'	214º30'
BC	124º30'	303º15'
CD	181º00'	1º00'
DE	179º45'	359º45'
EA	289º30'	108º45'

UNIT - IV

8) a) Explain the differences between the height of collimation method and the rise and fall method of reduction of levels.

b) Eight 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 2.325. The level was shifted after the third and sixth readings. The second change point was a benchmark of elevation 186.975 m. Find the reduced levels of the remaining stations. Use the rise and fall method.

OR

9) a) Explain briefly, the uses of contour maps.

b) A level was set up between two stations A and B. The distance to station A was 470m and the reading on the staff held at A was 1.855 m. The distance to station B was 690m and the reading on the staff held at B was 2.385m. Find the true difference in elevation between A and B.

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(DCE 214)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - IV : Strengths of Materials - I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What do you mean by stress and strain?

b) State Hooke's law.

c) Define Young's modulus.

d) What do you mean by ultimate stress and factor of safety?

e) What do you mean by points of contraflexure?

f) State the relation between B.M. and S.F. at any section of a beam.

g) How do you find the maximum bending moment in a beam?

h) Define pure bending.

i) Define section modulus.

j) Draw shear stress distribution diagram for Rectangular section.

k) What do you mean by angle of twist?

l) Write any two assumptions made in the theory of pure torsion.

m) What do you mean by polar moment of Inertia?

n) What do you mean by polar modulus.

o) Define helical spring.

UNIT - I

2) A metallic bar 300mm × 100mm × 40mm is subjected to a force of 10KN (tensile), 16KN(tensile), and 14 KN(Tensile) along X, Y and Z directions respectively. Determine the change in the volume of the block. Take $E = 2 \times 10^5 N/mm^2$, and Poisson's ratio = 0.25.

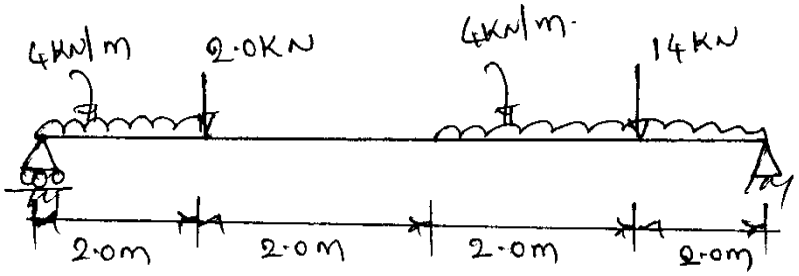
OR

3) a) Derive a formula for the stresses in uniformly tapering bars.

b) The ultimate shear stress of a mild steel plate of 12mm is $380N/mm^2$. Calculate the diameter of the hole that can be punched to it without exceeding a compressive stress of $750N/mm^2$.

UNIT - II

4) Draw the SFD and BMD for the beam loaded as shown in the figure 1.



Fig①

OR

5) A simply supported beam of 10mts effective span carries a uniform load which produces a bending moment of 6500 N-m at a section of 5mts from the left support. Calculate the value of the load in N per metre run. Find also the maximum bending moment in the beam.

UNIT - III

6) A beam of 100mm square cross section is used with a diagonal in a vertical position. If the vertical shear force at a section is 1250N, find the shear stress at the neutral axis and the maximum shear stress occurring and its location in the cross-section.

OR

7) A beam 100mm wide and 200mm deep is used as a simply supported over a span of 3.5m with a UDL of 1.5 KN/m. Find

a) the stress developed at a section 1m from right hand support,

b) position and magnitude of the maximum stress developed in the beam.

UNIT - IV

8) a) Derive expressions for finding out shear stress at any point on the cross – section of a circular shaft under pure torsion.

b) Find suitable expression to determine the angle of twist of any cross-section of a circular shaft subjected to an external torque.

OR

9) A close coil helical spring is made by 10mm dia Steel rod, the coil consisting of 8 turns with a mean diameter of 100mm. The spring carries an axial pull of 200N. Find the maximum shear stress induced in the rod, deflection of the spring, the stiffness and strain energy stored by the spring. Take $C = 8 \times 10^4 N/mm^2$.

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(DCE 215)

B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - V : Fluid Mechanics

Time : 03 Hours **Maximum Marks : 75**

Answer Question No.1 is compulsory ***(15)***

Answer One question from each unit ***(4×15=60)***

1) a) Define buoyancy?

b) What is metacentre?

c) Define stream line?

d) Give Bernoulli's equation?

e) List out different discharge measuring devices?

f) What is boundary layer thickness over a flat plate?

g) What is meant by convective acceleration?

h) What is streakline?

i) Differentiate between Newtonian and Non- Newtonian fluids?

j) Write the equation for Reynolds number?

k) Define water hammer?

l) Give the expression for friction factor for pipe flow?

m) What does the Moody's chart indicates?

n) List out various types of losses?

o) What is critical velocity?

UNIT –I

2) a) Define the following fluid properties: Density, weight density, specific volume, and specific gravity of the fluid?

b) One litre of crude oil weighs 0.96 kg (f). Calculate its specific weight, density and specific gravity?

OR

3) Differentiate between the following with neat sketches:

i) Absolute and gauge pressure.
ii) Simple manometer and differential manometer.
iii) Piezometer and pressure guages.

UNIT –II

4) Explain different types of flows with expressions?

OR

5) a) Define local Acceleration and convective acceleration?

b) The velocity vector in a fluid flow is given $V = 4x^3i - 10x^2 yj + 2 tk$. Find the velocity and acceleration of fluid of particle at (1, 2, 3) at time t = 1.

UNIT –III

6) a) Derive the expression $C_d = C_v \times C_c$?

b) Define ;

i) Vena- contracta;
ii) Orifice
iii) Mouth piece.

OR

7) What do you understand by 'velocity of approach'? Find an expression for the discharge over a rectangular weir witch velocity of approach?

UNIT –IV

8) Derive the Darcy- Weisbach equation in a pipe flow?

OR

9) a) Explain Reynolds experiment?

b) Explain the concept of laminar sub layer in an hydrodynamically smooth and Rough boundaries?

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(DCE 216)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper – VI : Engineering Geology

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is the importance of geology in civil Engineering.

b) Define weathering process.

c) List out the types of erosion.

d) Define mineral.

e) How clay minerals are indentified.

f) What is the importance of petrology.

g) How sedimentary rock are formed.

h) List out the types of metamorphism.

i) Define structural geology.

j) Define strike and dip.

k) Write any two effects of earth quakes.

l) List out the types of dams.

m) Write any two purposes of tunneling.

n) How the fluoride problem is cleared in ground water.

o) What are the different types of dams.

UNIT - I

2) Explain the geological work of rivers under the following headings.

a) River erosion

b) River transport and deposition.

OR

3) a) Explain the mode of function of minerals.

b) Explain the significance of different physical properties in mineral identification.

UNIT - II

4) Explain the classification of Rocks and the importance of petrology in civil Engineering.

OR

5) Explain the various effects imposed on the pre-existing rocks due to metasomatic processes. How they differ from change brought about by metamorphic processes of other types.

UNIT - III

6) a) What are Joints and what are the effects of Joints from the civil engineering point of view?

b) Give the classification of Joints with the help of neat sketches.

OR

7) Enumerate the various types of landslides and explain the causes of landslides and the preventive measures to be taken to prevent there landslides.

UNIT - IV

8) Explain the following Geophysical methods.

a) Electrical methods. b) Radio metric methods.

OR

9) a) Mention the deteriorating effects produced in the ground during the excavation of tunnels.

b) Mention the variety of purposes served by tunnels.

(DCE 221)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper – I : Concrete Technology

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) How is concrete classified according to strength is IS 456-2000.

b) What are the constituents of concrete.

c) Why is concrete tested on the 28^{th} day after casting.

d) What is no-fines concrete.

e) Define fineness modulus.

f) What is the effect of the maximum size of aggregate on concrete strength?

g) What are plasticizers and write its impotence.

h) List out any two different types of workability aids.

i) What is re-vibration.

j) How bleeding of concrete occurs.

k) What do you understand by carbonation of concrete.

l) How impermeable is concrete

m) Write any two advantages of using high-strength concrete.

n) Define high-performance concrete.

o) List out any four types of polymers used in concrete.

UNIT - I

2) a) Describe the hydration reaction of important Bogue compounds indicating the products of hydration.

b) Describe the impotence of sieve analysis in determining particle size distribution

OR

3) a) Explain in detail the important chemical tests conducted on cement to determine its quality.

b) What are the effects of the shape and texture of aggregates on the strength and workability of concrete.

UNIT - II

4) a) Define the term workability? Explain its significance.

b) How the workability of concrete is to be adjusted according to the size of the aggregate and reinforcement particulars in RCC work.

OR

5) a) What are the different chemicals used to obtain the desired colors on a concrete surface.

b) Discuss maturity of concrete? How is it measured? What are its practical uses in the concrete industry.

UNIT - III

6) a) How the compressive strength test on a concrete cube is conducted? Explain in detail with a neat diagram.

b) Explain how the w/c ratio affects the compressive strength of concrete?

OR

7) a) Explain in detail how the flexural strength of concrete is determined with a neat sketch.

b) Explain how grade of concrete affects, the flexural strength of concrete.

UNIT - IV

8) a) How no-fines concrete is prepared? What are its applications.

b) How the cellular concrete is prepared? What are its applications.

OR

9) a) Explain durability of concrete and emphasize various specifications suggested by relevant codes.

b) Explain the 'permeability' of concrete and its influence on the strength of concrete.

(DCE 222)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - II : Building Drawing

Time : 3 Hours **Maximum Marks: 75**

Answer ONE question from each unit

UNIT - I

1) a) Write a short notes on the following set back, Building line, Floor area ratio, floor space index. **[10]**

b) Classify the buildings based on occupancy and type of construction. **[10]**

OR

2) a) Discuss the various bye-laws as applied to buildings and indicate their usefulness or otherwise. **[10]**

b) Write a short notes on building bye-laws, bringing out their merits and demerits and their implementation. **[10]**

UNIT - II

3) Draw the elevation and sectional plan of 2/3 panelled and 1/3 glazed door suitable for an opening of 1000 mm ×2000 mm in a wall of 300 mm thick. Indicate clearly the position of the various components of the door. **[20]**

OR

4) A primary health center is to be constructed in a village. The site measures 75m x 45m with frontage along north-south direction. The wind direction is south- south east. Draw a line diagram of the building to accommodate. **[20]**

i) Waiting room ii) Doctor's room

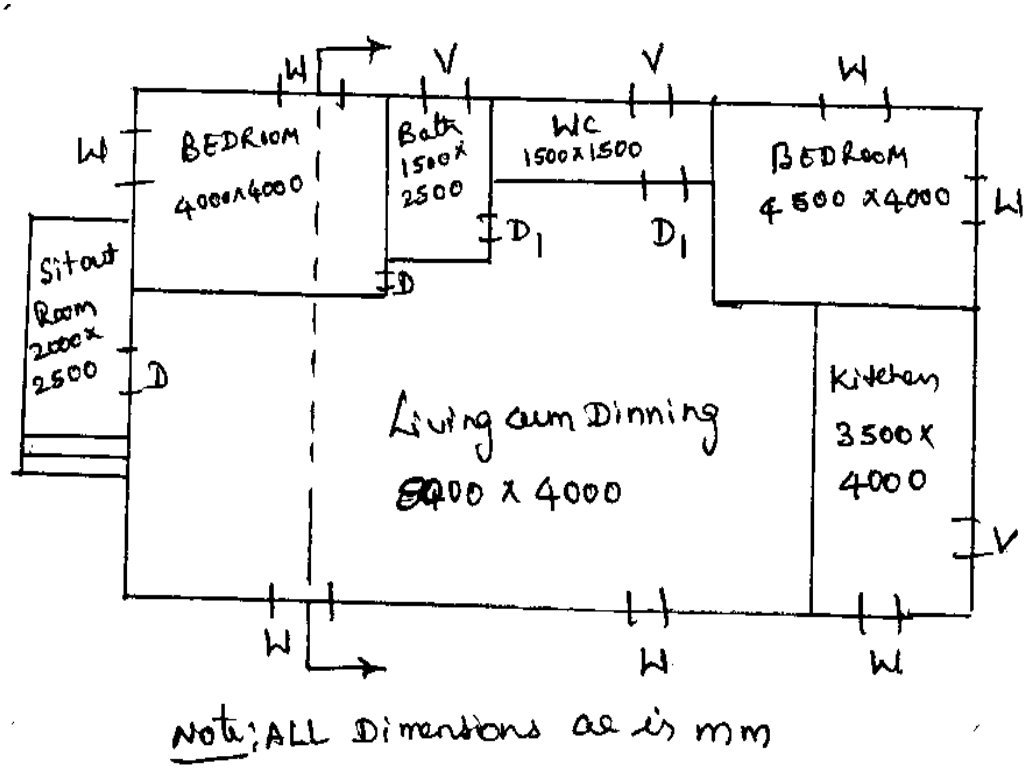
iii) Examination room and iv) Verandah

Briefly explain the principles of your planning.

UNIT - III

5) The single line diagram of a residential building is shown in fig 1. Finalize the plan by fixing up dimensions of all openings like doors, windows and ventilations. Provide necessary built-in features and suggest suitable specifications, for all the components of the building. Draw the following views to a suitable scale.

a) Plan b) Section at X – X c) Front elevation **[15 +10+10]**



Fig①

OR

6) Draw the plan and elevation of a hotel building with the help of the data given below to a scale of 1:50. **[20+15]**

i) Entrance foyer -1

ii) Reception room-1

iii) Public rooms -2

iv) Bed room with bath cum W.C-10

v) Kitchen -1

vi) Sanitary units -2

vii) Store room -1

viii) Recreation units-2.

(DCE 223)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - III : Surveying - II

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) What is a tacheometer?

b) What is the trapezoidal rule for calculation of an area?

c) What is the formula for finding out the horizontal distance by using tacheometer when the line of sight is horizontal in fixed hair method?

d) Define the term line of collimation.

e) What is the prismoidal formula for the calculation of volume for the given cross section area?

f) What is the source of errors in theodolite traverse?

g) What is a compound curve?

h) What are the K and C value for a tacheometer fitted with anallactical lens?

i) What is the relationship between radius and degree of a curve?

j) What is a zero circle?

k) What is the axis of plate level?

l) Define vertical plane.

m) What is a traverse?

n) What are the methods used for setting out of a cuve?

o) The focal length of the object glass is 20cm and the distance from the object glass to the trunnion axis is 15 cm. Calculate the additive constant.

UNIT - I

2) a) Explain the features and use of an electronic theodolite.

b) Describe different types of prisms used for electronic distance measurements.

OR

3) Discuss in detail the advantages and disadvantages of the total station surveying over traditional methods of surveying.

UNIT - II

4) Offsets were taken from a survey line at 12 m intervals and the lengths of the offsets were (starting from the left): 0, 3.8, 4.4, 5.2, 4.8, 6.4, 5.9, and 0 m. Find the area between the survey line, the first and last offsets, and the boundary by the trapezoidal rule and Simpson's rule.

OR

5) Compute the area of cross-section if the formation width is 12 m, side slopes are 1 to 1, average height along the center line is 5 m, and the transverse slope of the ground is 15 to1.

UNIT - III

6) What are the different methods employed in tacheometric survey? Describe the method commonly used.

OR

7) a) Explain the principle and necessity of conducting trigonometric levelling.

b) Correct the observed altitude for the height of signal, refraction and curvature from the following data:

Observed altitude = $+2^{o}48'39"$

Height of the instrument = 1.12m

Height of the signal	=	4.87 m
Horizontal Distance	=	5112 m
Coefficient of refraction	=	0.07 m
R sin 1”	=	30.88 m

UNIT - IV

8) A curve of radius 300 m has a defection angle of 32^{o}. Calculate the radial and perpendicular offsets from the tangent to locate points on the curve. Calculate and tabulate the offsets. The number of offsets must be such that the offset length is less than 20 m.

OR

9) Explain with sketches the different triangulation systems.

EEE

(DCE 224)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper – IV : Strength of Materials - II

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) What is meant by plane stress condition.

b) Define principal plane.

c) Define major and minor principal stresses.

d) What is the impotence of Mohr's circle.

e) How many maximum number of principal planes will be in a strained body.

f) What do you mean by hoop stress.

g) What type of stresses are induced in a thin cylindrical shell subjected to an internal pressure.

h) Which stress should be taken into consideration while designing the thickness of a thin cylindrical shell and why.

i) What is the impotence of failure theories.

j) What are the classifications of columns.

k) What is buckling load?

l) What do you mean by effective length of a column.

m) What is the limitation of Euler's formula.

n) Define an elastic curve.

o) State Mohr's theorem I.

UNIT - I

2) a) Prove that no shear stress acts on principal planes.

b) Derive expressions for finding out normal and tangential stresses on an oblique plane in a rectangular element subjected to normal stress f_1 and f_2 and shear stress x.

OR

3) A simply supported beam of 3m length carries a central point load of 120kN. The beam section is rectangular of size 120 mm x 320 mm. Find the principal stresses and principal planes at a point 2m away from the left support and 250 mm below the top fibre.

UNIT - II

4) Calculate the maximum possible diameter of a boiler shell to resist an internal steam pressure of $5N/mm^2$ and plate thickness 12mm. The permissible stress of the plate material is $120N/mm^2$ and the efficiencies of longitudinal and circumferential joints are 70% and 50% respectively.

OR

5) a) Derive the relation for maximum and minimum stress intensity at the four corners of a column section subjected to a loading eccentric about both the principal axis.

b) What do you mean by eccentricity of loading? What are its effects on a column section.

UNIT - III

6) Find the Euler's crushing load for a hallow cylindrical cast iron column of 150mm external diameter and 20mm thickness. It is 6m long and hinged at both ends. Value of E is 7.5×10^4 N/mm^2. Compare the load with the crushing load given by Rankin's formula using a constant of $\frac{1}{1600}$ and $f_c = 565$ N/mm^2.

OR

7) Write a brief note on the following:

a) Maximum distortion energy theory.

b) Maximum strain energy theory.

UNIT - IV

8) A simply supported rectangular steel beam is of 3 mts length and 250 mm x 350 mm cross – section. Find the maximum slope and maximum deflections of the beam due to its self-weight. If the maximum slope is limited to $0^o\ 45^1$ and maximum deflection to 10mm, find the central point load that can be applied on the beam. Take E= 2 x 10^5 N/mm^2 and density of steel 80kN / m^3.

OR

9) A simply supported beam of 5 mts span is subjected to an impact loading by dropping a weight of 20kN at its centre from a height of 20mm. Find the maximum instantaneous deflection under the load. Take EI as 6000 kNm^2, use first principle.

EEE

(DCE 225)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper – V : Hydraulics & Hydraulic Machines

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) What do you mean by hydraulic jump?

b) What is the function of draft tube?

c) List out types of flows in open channels?

d) What is critical depth?

e) What is Dynamic equation in GVF?

f) What do you mean by 'vane'?

g) Give the ratio of mach number?

h) What are the effects due to cavitation?

i) What is priming?

j) What do you mean by pump?

k) Define turbine?

l) What is the device used for measuring shaft speed?

m) Define specific speed?

n) What is dynamic similarity?

o) How the velocity distribution in a open channel vary from boundary to surface of water level.

UNIT - I

2) a) A channel has vertical walls 1.2 m apart and a semi – circular invert. If the centre line depth is 0.9m and the bed slope is lin 2500, find the discharge using Chezy's formula with c = 54.

b) Explain classification of flows?

OR

3) Explain the concept of momentum principle applied to open channel flow and specific force?

UNIT - II

4) a) Explain the classification of surface profiles?

b) Derive the dynamic equation for gradually varied flow?

OR

5) In a horizontal rectangular channel 1.5m wide, if the observed depths before and after the jump are 0.2m and 1.0m respectively, determine the discharge flowing through the channel.

UNIT - III

6) a) Explain the angular momentum principle with neat definition sketch?

b) Velocity distribution for laminar flow of real fluid in a pipe is given as $V = V_{max}\left[1-\left(\frac{r^2}{R^2}\right)\right]$, where V_{max} is velocity at the centre of pipe, R is pipe radius, and V is velocity as radius r from centre of pipe. Determine momemtum correction factor.

OR

7) Explain principle and function of Francis Turbine with neat sketches.

UNIT - IV

8) a) Describe various losses and efficiencies in a centrifugal pump?

b) Explain Rayleigh's method?

OR

9) a) Explain the following terms with examples:

i) Geometric similarity

ii) Kinematic similarity

iii) Dynamic similarity

b) Show by method of dimensional analysis that the resistance R to the motion of the sphere of diameter D moving with velocity V through a fluid having density e and viscosity μ may be expressed as

$$R = (eD^2v^2)\ \phi\left(\frac{\mu}{evD}\right)$$

EEE

(DCE 226)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper – VI : Fundamentals of Electrical Science & Mechanical Science

Time : 3 Hours **Maximum Marks: 75**

Question No.1 & 6 are compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

PART -A

1) a) Differences between DC and AC.

b) Advantages of full wave rectifiers.

c) Different types of DC generator.

d) Applications of transformers.

e) Different parts of DC motor.

f) Basic principle of Induction motor.

g) Stress in overhead conductors.

UNIT - I

2) a) Define current. Explain the differences between DC and AC supply.

b) With neat sketch explain the principle of DC generator. List its advantages and limitations.

OR

3) Explain the principle of operation of single phase transformer with the help of neat diagram.

UNIT - II

4) a) Explain the basic principle of operation of alternator with a neat sketch. List its advantages.

b) What is the application of transmission lines? What are the different types of electrical towers?

OR

5) Explain the constructional features of 3-phase induction motor with neat sketches. Derive its induced EMF equation.

PART -B

6) a) Explain about velocity ratio in transmission.

b) Define 'slip'.

c) Open cycle for gas turbine.

d) Applications of drawing operation.

e) Types of welding.

f) Rotary turbine.

g) Air compressors.

UNIT - III

7) What is casting process? What are the different casting processes with neat sketches.

OR

8) a) Explain different operations performed on milling machine.

b) Explain the differences between welding and soldering.

UNIT - IV

9) Derive the expression for the length of the belt drive for open belt drives.

OR

10) a) What is the type of turbine which is most popular in steam turbine power plant?

b) Define the terms:

i) Hydraulic efficiency

ii) Mechanical efficiency

iii) Overall efficiency of a turbine

EEE

(DEC / DME / DCE 227)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELEC & COMMU and MECHANICAL and CIVIL ENGINEERING

Paper – VII : Environmental Science

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) Write briefly on:

a) Composting.

b) Global Warming.

c) Nuclear Reactor at Nagarjuna Sagar

d) Kolleru lake –aquaculture in AP

e) Wet Lands

f) Water shed management

g) Nuclear Hazards

h) Cloud Seeding.

i) Water logging

j) Indoor Airpollution

k) Flood

l) Soil Erosion

m) Hot Spots.

n) Thermal pollution

o) Salinity.

UNIT - I

2) Discuss about present environmental issues on global concern.

OR

3) a) Define renewable and non renewable resources.

b) Discuss about the energy resources.

UNIT - II

4) Discuss causes, effects and control measures of water pollution.

OR

5) Discuss about the

a) Resettlement and rehabilitation of people.

b) Urban problems related to energy.

UNIT - III

6) Write a detailed explanation about local polluted site of your choice.

OR

7) What is 'Sustainable Development' ? Discuss the concept of Sustainable Development.

UNIT - IV

8) Discuss about the air and water prevention and control of protection act.

OR

9) Discuss the salient features of the Environment Act,1986.