B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - I : Mathematics - III

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

Answer question No.1 compulsory   *(15)*

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

1)   Answer the following questions :

   a)   State Euler's formula.

   b)   Define periodic function.

   c)   Define even function.

   d)   Find a_o in the Fourier series of $f(x) = |\sin x|$ in the interval $-\pi < x < \pi$.

   e)   Write a formula for Fourier cosine transformation of $\dfrac{\partial^2 v}{\partial x^2}\ x,t\ ,\ -\pi < x < \pi.$

   f)   State the parseval's formula.

   g)   Define Fourier sine integral.

   h)   If $f(x)=x^2$ is expressed as a Fourier series in (-1, 1), then find the Fourier coefficient 'b_n'.

   i)   Evaluate $\Delta^3(e^x)$.

   j)   State Newton's Backward interpolation formula.

   k)   Define complex form of Fourier series.

   l)   Define interpolation.

m) State the stirling's interpolation formula.

n) Write Bessel's formula.

o) State simpson's $\frac{3}{8}$ rule

UNIT - I

2) a) Find the Fourier series of the following function :

$f(x) = x^2 \ 0 \le x \le \pi = -x^2 - \pi \le x \le 0$

b) Find the half – range cosine series of the function $f(x) = (x - 1)^2$ in the interval $0 < x < 1$,

Hence show that $\pi^2 = 8\left[\dfrac{1}{1^2} + \dfrac{1}{2^2} + \dfrac{1}{3^2} + ...\right]$.

OR

3) a) If f(x) = |cosx|, expand $f(x)$ as a Fourier series in the interval $(-\pi, \pi)$.

b) Obtain the half range sine series for e^x in the interval $0 < x < 1$.

UNIT - II

4) a) Obtain the first three coefficients in the Fourier cosine series for y, where y is given in the following table.

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

b) Find the Fourier cosine transform of e^{-x^2} and hence evaluate Fourier sine transform of xe^{-x^2}.

OR

5) a) Find the Fourier sine transform of $\dfrac{1}{x\ x^2 + a^2}$.

b) Solve the integral equation $\int_0^\alpha f(x) \cos \lambda x \ dx = e^{-\lambda}$.

UNIT - III

6) a) Find a real root of the equation $3x = \cos x + 1$ by using Newton – Raphson method.

b) Find the missing terms of the following data :

x	1	1.5	2	2.5	3	3.5	4
f(x)	6	?	10	20	?	1.5	5

OR

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

x	1	1.4	1.8	2.2
f(x)	3.49	4.82	5.96	6.5

b) If $Y_{10} = 3$, $Y_{11} = 6$, $Y_{12} = 11$, $Y_{13} = 18$, $Y_{14} = 27$, find Y_4

UNIT - IV

8) a) For the given values.

x	150	152	154	158
$y = \sqrt{x}$	12.247	12.329	12.410	12.554

Evaluate $\sqrt{155}$ using Lagranges interpolation formula.

b) Using Newton's divided differences formula, evaluate f(8) and f(15). Given.

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

OR

9) a) Find the first and second derivatives of $f(x)$ at $x = 1.5$ if

x	1.5	2.0	2.5	3.0	3.5	4.0
f(x)	3.375	7.000	13.625	24.000	38.875	59.000

b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using trapezoidal rule taking $h = \frac{1}{4}$.

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(DCE 212)

B.Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the End of Second Year)

CIVIL ENGINEERING

Paper - II : Building Materials & Constructions

Time : 3 Hours   Maximum Marks : 75

Answer question No.1 compulsory   *(15 × 1 = 15)*

Answer ONE question from each unit

1)   a)   What are the Qualities of a good building stone?

   b)   What is meant by Dressing of stones?

   c)   What is meant by hydraulicity?

   d)   What are the advantages of cavity walls?

   e)   Give the Cross Section details of an exogenous tree.

   f)   Write few barrier materials for Sound Insulation.

   g)   What is annealing Process in case of steel.

   h)   Mention advantages of pitched roofs.

   i)   What are artificial stones?

   j)   What are terrazo and mosaic?

   k)   Give a neat sketch of a coping.

   l)   What is a Veneered wall?

   m)   What is the purpose of through stone?

n) Mention few damp proof materials.

o) What is the functions of king post in a king Post roof truss?

UNIT – I

2) a) Write a brief note on various tests that are conducted for stones. **(8)**

b) Explain the methods of stone quarrying. **(7)**

OR

3) a) Write in detail about manufacturing of bricks. **(8)**

b) What is the composition of good brick earth? **(7)**

UNIT – II

4) a) Explain the process of painting for new wood work. **(5)**

b) Write short notes on corrosion and its control. **(5)**

c) Noise pollution and its control. **(5)**

OR

5) a) Explain about various defects in painting. **(7)**

b) What is reasoning of timber? Explain various methods. **(8)**

UNIT – III

6) a) Write the differences between English bond and Flemish bond. **(8)**

b) What is meant by hearing capacity of soils? How can it be improved? **(7)**

OR

7) a) With neat sketches explain different types of Rubble masonry. **(8)**

b) State the various factors affecting the selection of foundations. **(7)**

UNIT – IV

8) a) What are the different types of scaffording? **(7)**

b) With neat sketches explain King post truss and Queen post truss. **(8)**

OR

9) a) Write short notes on :-

    i) Form work **(3)**

    ii) Cement concrete flooring **(3)**

b) Briefly explain about methods of underpinning. **(3)**

c) Explain the advantages and disadvantages of flat roofs. **(6)**

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B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - III : Surveying - I

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

Answer question No. 1 compulsory   *(15 x 1 = 15)*

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

1)   a)   Write about principles of surveying.

      b)   Define scale.

      c)   Explain about sources of Errors.

      d)   What is meant by Degree of accuracy?

      e)   Define Tape correction.

      f)   What is compass?

      g)   Write the errors in theodolite.

      h)   Define offset.

      i)   What is Local attraction?

      j)   Write about prismatic compass.

      k)   What are the methods of plane table surveying?

      l)   Define curvature.

      m)   What is profile levelling?

n)   Define contour.

o)   What is the location of a contour gradient?

Unit – I

2) a) Describe the different methods of setting out a right angle at a point on a chain line using a chain/tape only. *(8)*

    b) Discuss the advantages and disadvantages of plane table surveying over other method of surveying. *(7)*

OR

3) Write in detail about types of errors and their sources. *(15)*

Unit – II

4) a) Write about the reiteration methods of measuring horizontal angle with theodolite. *(8)*

    b) Write about the chain and tape corrections. *(7)*

OR

5) a) With a sketch explain the working principle of line Ranger. *(7)*

    b) Can you use a theodolite as a leveling instruments? If so how? *(8)*

Unit – III

6) a) Write in detail about various methods of plane tabling. *(8)*

    b) State and Explain the principles of chain surveying. *(7)*

OR

7) a) Explain : *(8)*

      i)   Well conditioned triangle.
      ii)   Tie line
      iii) Check line with neat sketch.

    b) Describe the Intersection method of surveying of plane Tabling? *(7)*

Unit – IV

8) a) Explain the block counter method of contour surveying. *(8)*

    b) Explain the sources of error in levelling. *(7)*

OR

9) The following readings were observed consecutively on a ground the instrument being shifted after 3rd, 6th and 8th readings. Find the RLS of all the staff stations if the B.M. of the first point is 100.000 m. *(15)*

0.055,   0.350,   0.455,   0.905,   1.545,   1.995,   2.505,

2.905,   0.675,   0.995,   1.655,   1.905,   2.005,   2.500

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B. Tech. DEGREE EXAMINATION, MAY - 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 x 15 = 60)*

1)   a)   Define stress and strain.

       b)   Define strain energy.

       c)   Define volumetric strain.

       d)   What is elastic limit.

       e)   For the given beam find reactions at supports; beam AB of length '*l*' carrying a central point load '*w*' with simple supports at the ends.

       f)   Define Bulk modulus.

       g)   What is meant by factor of safety.

       h)   Explain Hooke's law.

       i)   Define torsional rigidity.

       j)   What is pure bending.

       k)   Define lateral strain.

       l)   What is shear centre.

       m)   What is fitched beam.

n) What is the relation between young's modulus, shear modulus and bulk modulus.

o) What do you mean by principle of super position.

Unit – I

2) A steel rod 18 mm in diameter passes centrally through a steel tube 25 mm in internal diameter and 30 mm in external diameter. The tube is 750 mm long and is closed by rigid washers of negligible thickness which are fastened by nuts threaded on the rod. The nuts are tightened until the compressive load on the tube is 20 kN. Find the stresses in the tube and the rod. Find the increase in these stresses when one nut is tightened by one quarter of a turn relative to the other. There are 4 threads per10 mm,   E = 200 kN/mm^2.   **(15)**

OR

3) a) Deduce a formula for the elongation of a prismatic bar under the action of its own weight.

   b) Three equal vertical rods 45 mm diameter each jointly supported a load of 1600 kN. The middle rod is made of steel and the end rods are made of copper. Each rod is 3 m long and the rods are such spaced that each rod shares equal amount of load. Now an additional load of 1600 kN is attached to the rods through a platform attached at the bottom of the ends. Determine the final stress setup in each rod. Take 'E' for steel as 2×10^5 N/mm^2 and 'E' for copper as 100×10^5 N/mm^2.   **(8)**

Unit – II

4) A horizontal beam 10 m long carries a UDL of 180 N/m and in addition a concentrated load of 200 N at the left end. The beam is supported at 2 points 7 metre apart, so chosen that each support carries half the total load. Draw the S.F.D. and B.M.D.   **(15)**

OR

5) A beam of span L, simply supported at the ends, is loaded with a triangular load with intensity zero at one end to 'w' per unit length at the other end. Plot the shear force and bending moment diagrams, indicating the principle values.   **(15)**

Unit – III

6) A timber beam is freely supported on supports 6 meters apart. It carries a U.D.L. of 12 kN/m run and a concentrated load of 9 kN at 2.5 m from the left support. If the stress in timber is not to exceed 8 N/mm^2, design a suitable section making the depth twice the width.   **(15)**

OR

7) A beam of square section is placed horizontally with one diagonal placed horizontally. If the shear force at the section of the beam is 'S', draw the shear stress distribution diagram for the section. *(15)*

Unit – IV

8) A hallow shaft with diameter ratio 3/5 is rearrived to transmit 450 kW at 120 rpm with a uniform twisting moment. The shearing stress in the shaft must not exceed 60 N/mm^2 and the twist in a length of 2.5 m must not exceed 1. Calculate the minimum external diameter of the shaft satisfying these conditions. Take $C = 8 \times 10^4$ N/mm^2. *(15)*

OR

9) A weight of 350 N is dropped through a height of 800 mm on to a closely coiled compression spring which is instantaneously compressed by 200 mm under the impact. If the diameter of the rod with which the spring is made is 25 mm and the mean coil radius of the spring is 100 mm. Find the maximum instantaneous stress produced by the impact and the no. of coils in the spring. Take $C = 0.80 \times 10^5$ N/mm^2. *(15)*

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B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - V : Fluid Mechanics

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

Answer question No. 1 compulsory   *(15)*

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

1)   a)   State the hydrostatic law of pressure distribution.

      b)   What is meant by metacentric height and its age?

      c)   What is hydrostatic paradox?

      d)   State the limitations of Bernoulli's equation.

      e)   What is laminar sub-layer?

      f)   Differentiate between convective and local acceleration giving two examples for each.

      g)   What is pascal's law? Prove it?

      h)   What are the advantages of venturimeter?

      i)   State the chezy's formula for loss head due to friction in pipe.

      j)   Define nominal thickness of boundary layer.

      k)   Distinguish between pilot tube and pilot – static tube.

      l)   What is syphon? Where is it used?

      m)   Define total energy line.

n) What is meant by water hammer?

o) Explain one, two, three dimensional flows.

Unit – I

2) a) Explain the phenomen of cavitation.

   b) A liquid with volume of 0.2 cubic meters at 300 kpa is subjected to a pressure of 3000 kpa and its volume is found to decrease by 0.2%. Calculate the bulk modulus of elasticity of the liquid.

OR

3) a) Explain any method of determination of meta centric height.

   b) Determine the total pressure and centre of pressure on an isosceles triangular plate of base 4m and altitude 4 m when it is immersed vertically in an oil of sp. gr 0.9. The base of the plate coincides with the free surface of the oil.

Unit – II

4) a) Derive Bernoulli's equation from first principles indicating the assumptions made at the appropriate stage of the derivation.

   b) The diameter of a tapering inclined pipe changes uniformly from 30 cm to 45 cm. The smaller end is 30 m above the larger. Water flows from the smaller end at a rate of 125 lps. The loss of head due to friction is 20% of the velocity head at the entrance. If the pressure at the entrance is 1.4 kg/cm^2 find the pressure at the exit.

OR

5) a) What is the need for momentum and energy correction factors? Derive the expression for that factors.

   b) An orificemeter with orifice diameter 20cm is inserted in pipe of 30 cm diameter. The pressure difference measured by a mercury differential manometer on the two side of the orificemeter shows a value of 50 cm of mercury. Find the discharge of an oil flowing in the pipeline whose specific gravity is 0.8. Take $C_d = 0.65$.

Unit – III

6) a) Derive the expression for discharge through rectangular notch.

   b) Describe the boundary layer growth over a flat plate

OR

7) a) Derive an expression to find the discharge through an external cylindrical mouth piece.

b) Water is flowing over a rectangular sharp erested weit of 2 m long, the head over the sill of weir is 0.80m. The approach channel is 2.6 m wide and the depth of flow in the channel is 1.7 m. Take coefficient of discharge as 0.62. Determine the discharge considering the end contractions and velocity of approach.

Unit – IV

8) a) Obtain an expression with a neat sketch for hydraulic gradient line and total energy line.

b) Enumerate the distinguish characteristics of laminar and turbulent flow.

OR

9) a) Find the discharge through a 50 mm pipe which draws water from a reservoir and delivers into atmosphere. The level of water in the reservoir above the open end of the pipe is 10 m. Length of the pipe is 500 m and friction factor = 0.03.

b) Distinguish between hydrodynamically smooth and rough boundaries.

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(DCE 216)

B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - VI : Engineering Geology

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

__Answer question No. 1 compulsory__   *(15)*

__Answer ONE question from each unit__   *(4 x 15 = 60)*

1)   a)   Define Geology.

     b)   What is meant by Erosion?

     c)   Write short note about Rock Cycle.

     d)   Define Metamorphism.

     e)   Draw the diagram of chevron fold.

     f)   Define unconformity.

     g)   What is meant by outcrop?

     h)   Define land slide.

     i)   Define Rock.

     j)   What are the different types of dam?

     k)   Define over break.

     l)   What is meant by Soil Degradation?

     m)   What are the different parts of Dam?

     n)   Write about Ground water Quality.

     o)   Define Isomorphism.

Unit – I

2)   a)   Write about the importance of geology in civil engineering point of view?   *(8)*

       b)   What are the rock forming Minerals? And explain about their identification in detail.   *(7)*

<div align="center">OR</div>

3)   Write the physical properties, chemical composition and uses of following minerals.   *(15)*

       a)   Asbestos   b)   Dolerite

       c)   Feldspar   d)   Hornblende

       e)   Mica

Unit – II

4)   What is the texture of Igneous rocks? Discuss briefly the types of textures found in Igneous Rocks.   *(15)*

<div align="center">OR</div>

5)   Describe about the following :

       a)   Insitu tests for Deformability Tests.   *(5)*

       b)   Shear Tests.   *(5)*

       c)   Strength Tests for Internal Stresses.   *(5)*

Unit – III

6)   a)   What are the parts of FOLDS? Classify the types of joints with sketches.   *(7)*

       b)   How would you distinguish between joints and faults? How do they influence major civil engineering works?   *(8)*

<div align="center">OR</div>

7)   a)   Describe the classifications and causes of Earthquakes.   *(7)*

       b)   Describe the various effects of Earthquakes? How do we measure the earthquakes by earthquake measuring scales.   *(8)*

Unit – IV

8)   Explain the following geophysical methods with suitable sketches. Also discuss their importance.

       a)   Electrical Resistivity Method.   *(5)*

       b)   Seismic Refraction Method.   *(5)*

       c)   Geophysical Methods of Investigation.   *(5)*

<div align="center">OR</div>

9)   Explain the purposes, effects and geological considerations for Tunneling.   *(15)*

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B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - I : Concrete Technology

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

__Answer question No. 1 compulsory__   *(15)*

__Answer ONE question from each unit__   *(4 x 15 = 60)*

1)   a)   Define durability of concrete.

      b)   What is a retarder?

      c)   Define hydration of cement.

      d)   What are the Indian standard specifications for initial and final setting time of OPC?

      e)   What is segregation?

      f)   What are admixtures?

      g)   What is No-fines concrete?

      h)   Define water cement ratio.

      i)   What are plasticizers?

      j)   What is the importance of impact strength of concrete?

      k)   How are aggregates are classified?

      l)   What is acid attack?

      m)   Define bleeding.

n) How is permeability of concrete measured?

o) What are the Bogue's compounds?

UNIT – I

2) a) Describe the oxide composition of ordinary Portland cement.

   b) What are the main compounds into which the above oxides will transform in the process of fusion?

OR

3) a) Write about calcium carbide method to measure the moisture content of aggregates.

   b) Write about sulphate resisting cement.

UNIT – II

4) Write about the classification of admixtures.

OR

5) a) Write a short notes on quality of mixed water.

   b) What are the factors affecting workability?

Unit – III

6) a) What are the factors affecting the shrinkage of concrete and discuss their influence.

   b) How do you find permeability of hardened concrete in the laboratary.

   c) Discuss carbonation shrinkage.

OR

7) Explain the manufacturing process of concrete.

UNIT – IV

8) What is sulphate attack? And what are the methods of controlling sulphate attack.

OR

9) a) Explain salient features of light weight concretes.

   b) Explain different types of fibres used to prepare fibre reinforced concretes and their relative features.

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(DCE 222)

B.Tech. DEGREE EXAMINATION, MAY - 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) Explain the following as applicable to residential building. **(20)**

    a)   Flexibility

    b)   Illumination

    c)   Orientation

    d)   Privacy

OR

2)   a)   Write a note on building regulations. **(10)**

    b)   Write a short notes on Building bye-laws. **(10)**

UNIT – II
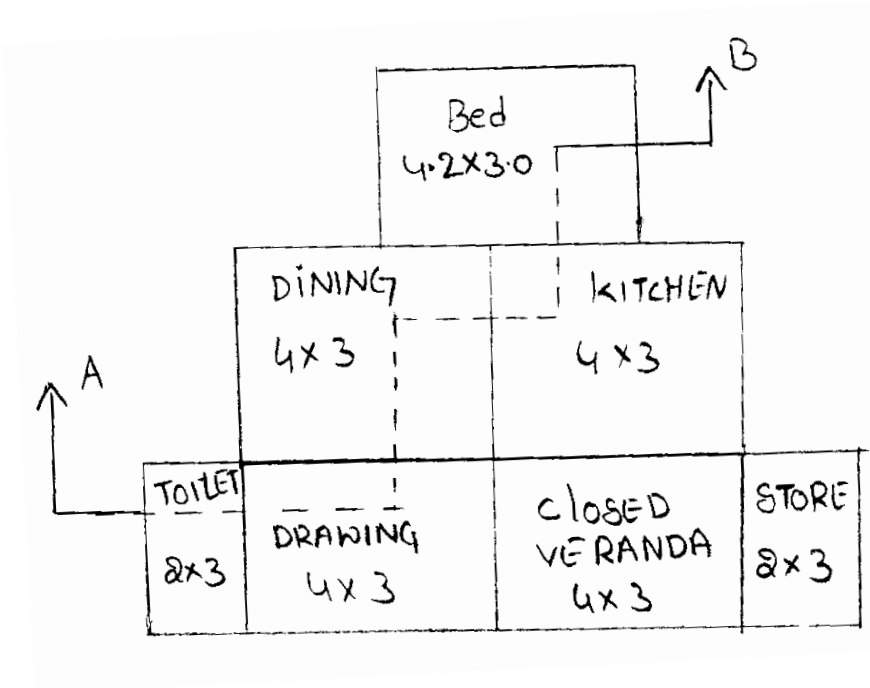
3)   a)   Give the classification of buildings as per NBC. **(10)**

    b)   Give the plan and elevation of a dog – Legged Stair. **(10)**

OR

4)   a)   Draw conventional signs for **(10)**

       i)   Rock

       ii)   Ceramic Tiles

       iii)   Concrete

       iv)   Glass

    b)   What are the requirements of a good stair? **(10)**

UNIT - III

5) The line diagram (of clear inner dimensions) for a residential building is an follows. **(35)**

(All Dimensions are in meters)

All walls of superstructure are 200 mm thick

Good soil for foundation in available at a depth of 1200 cm.

Assume all other data Draw.

a)   A neat dimensional plan.

b)   Section of AB.

OR

6)   A residential building is to be planned for a practising advocate with the following requirements. **(35)**

a)   Living cum drawing hall.   b)   Master bed room with toilet.

c)   Second bed room.   d)   Kitchen and store.

e)   Additional bath and W.C.   f)   Staircare and pootico.

The dimensions of the site one 15m × 20m and the road is on western side parallel to 15m

side. Plinth area is not to exceed 125sqm. Adopt moderate specifications. Draw to a scale of

1 : 50.

i)   Site plan   ii)   Plan

iii) Sectional elevation   iv)   Front elevation.

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B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the End of Second Year)

Civil Engineering

Paper - III : SURVEYING - II

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

Answer question No.1 compulsory   *(15 × 1 = 15)*

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

1)   a)   What is the use of Total Station?

       b)   What is the principle of EDM?

       c)   What is Departure?

       d)   What is the use of planimeter?

       e)   What are consecutive coordinates?

       f)   What is Tacheometric Surveying?

       g)   Name the instrument used to find out irregular areas of maps.

       h)   What is degree of a curve?

       i)   From which point, a curve originates?

       j)   What is Base Line?

       k)   What is the principle of Triangulation?

       l)   Why the very first tangent of a curve is called 'Back Tangent' ?

       m)   What is axis of plate level?

n) What do you mean by omitted measurements?

o) What is an analatic lense?

UNIT – I

2) a) Write in detail about total station with sketches.

b) What is basic principle of E.D.M.? What are the instrumental error in E.D.M.?

OR

3) Write about various types of omitted measurements and procedures to get missing data.

UNIT - II

4) The following offsets were taken from a chainline to the boundary of an area at regular intervals of 20m.

2.5, 1.2, 3.1, 3.5, 6.2, 4.1, 6.9, 4.4, 4.8, 1.6.

Compute the area enclosed in between by using Simpson's rule.

OR

5) The following are the levels along the central line of a railway track.

Chainage   0   50   100   150   200   250   300

R.L.   13.50 12.45 12.15 11.55 10.95 12.05 10.80

If the formation of the track is at a constant level of 10.00, compute the volume of cutting if the width at formation in 10m and the side slopes are 1.5 : 1.

UNIT - III

6) a) A Tacheometer with multiplying constant 100 and addictive constant 0.3 was set up at a station O and the following results was observed by at keeping the staff vertical. Calculate the horizontal distance between O and P and the reduced level of P.

Inst Station	Staff Station	Staff readings	Ver. Angle	Remarks
O	B.M.	1.875, 2.150, 2.425	$+6^o$	R.L. of BM=152.6m
	P	1.650, 1.800, 1.950	$-10°30'$	

OR

7) Find the elevation of the top of the flag staff from the following data.

Inst. Station	Reading on B.M.	Angle of Elevation	Remarks
A	0.862	$18°36'$	RL of BM = 421.380 m
B	1.222	$10°12'$	Distance AB = 50 m

Stations A,B and top of the flag staff are in a same vertical plane.

UNIT - IV

8) Write about the four Linear methods of setting out a simple circular curve?

OR

9) Write in detail about principle and classification of triangulation with sketches.

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B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the End of Second Year)

CIVIL ENGINEERING

Paper - IV : Strengths of Materials - II

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

Answer Question No.1 compulsory   *(1 × 15 = 15)*

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

Assume suitable data

1)   a)   Define principle stress?

      b)   Define the term longitudinal stress?

      c)   Write the basic differential equation of the elastic curve?

      d)   What are the effects of eccentric loads on short column?

      e)   Define maximum strain energy theorem?

      f)   What is the importance of Mohr's stress circle?

      g)   What is Shear Strain energy?

      h)   What is buckling load?

      i)   Define long Column?

      j)   Write any two assumption's made in Euler's theory?

      k)   What is middle third rule?

      l)   Define the term factor of safty?

      m)   Define modules of Resilience?

n) What is kernel of section?

o) What are the classification of columns?

UNIT - I

2) A point with in a loaded beam is under bending stress of 30 MPa (tensile) and shear stress of 25 MPa. Find out principal planes passing through the points and principle stress by using Mohr's circle method? **(15)**

OR

3) A simply supported beam of span 4 m carrying a concentrated load of 30 KN at mid span. Find the strain energy stored in the beam due to horizontal shear. The beam is 7.5 cm wide and 10 cm deep. Take $E = 300$ GN/m^2 and Poisson's ratio = 0.32?

UNIT - II

4) The line of thrust in a compression testing specimen is 32 mm diameter is parallel to axis of specimen, but is displaced from it. Calculate the distance of the line of thrust from the axis when the maximum stress is 15% greater than the mean stress on normal section? **(15)**

OR

5) A thin cylindrical boiler is of internal diameter 2.5m, thickness of metal 12mm and the permissible tensile stress of plate is 80 N/mm^2. The efficiency of longitudinal Joint and circumferential joint are 75% and 45% respectively. Calculate, the permissible stream pressure and longitudinal and circumferential stresses in the solid plate?

UNIT - III

6) A steel tube has a mean dia of 120 mm and a thickness of 3 mm. Calculate the torque which can be transmitted by the tube with a factor of safety "ψ" if the criterion of failure is **(15)**

a) Maximum shear stress and

b) Maximum strain energy theory

Take $E = 2.1 \times 10^5$ N/mm^2 and r = 0.30?

OR

7) A hollow circular C.I column 6 m long and having both ends rigidly fixed has a support on axial load of 1000 KN. The ratio of inner radius to outer radius is 3:4, crushing stress at failure for C.I may be taken as 200 KN/mm^2. If the work load is not exceeding 1/5th of buckling load and 1/3rd of the crushing load. Find minimum external diameter of column? Take $E = 2 \times 10^5$ N/mm^2, α = 1/1600.

UNIT - IV

8) Derive an expression to find out the equation for slope & deflection of a cantilever beam of length 'I' and uniform EI with the uniformly distributed load 'W' per unit run over whole length. Hence evaluate its maximum slope and deflection? **(15)**

OR

9) A cantilever of 3 m span carries a uniformly distributed load of intensity 20 KN/m over the entire span together with a point load of 30 KN at free end. Find, maximum slope and maximum deflection. Take EI = 6×10^{12} N/mm^2?

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B. Tech. DEGREE EXAMINATION, MAY - 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 compulsory   *(5 × 3 = 15)*

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

1)   a)   What is meant by hydraulically efficient?

     b)   Differentiate between pump and turbine.

     c)   Write the functions of draft tube.

     d)   Explain the concept of primning. Why is it necessary?

     e)   Mention the model laws for partially submerged objects.

UNIT - I

2)   a)   Derive the condition for most economical section of a reactangular channel of an open channel.

     b)   Determine the dimensions of economical section of lined trapezoidal channel to carry a discharge of 20 cumes at a velocity of 1.5m/s. Bed slope is lin 3,000. Manning's n is 0.020.

OR

3)   a)   Explain chezy's and Manning formula. Derive the relation between C and n.

     b)   Explain the energy variation in a short hydraulic jump using the specific energy equation.

UNIT - II

4)   a)   Derive the dynamic equation for a gradually varied flow by stating the assumptions.

     b)   What is a surge? Distinguish between a positive surge and a negative surge.

OR

5) a) A shrice gate discharges water into a horizontal rectangular channel with a velocity of 10m/s and depth of flow of 1m. Determine the depth of flow after the hydraulic jump and consequent loss of head.

b) Briefly describe the classification of surface profiles in open channel flow.

UNIT - III

6) a) A hydraulic turbine develops 7350 kw under a head of 16 m at a speed of 90 r.p.m. gives an efficiency of 90%. Calculate the water consumption and the specific speed.

b) Derive the expression for force exerted by a jet striking a stationary curved vane.

OR

7) a) A Jet of water with a velocity 25m/s impinging normally on a flat vane moving away from it at 10 m/s. The cross-sectional area of Jet $0.02m^2$. Determine the force exerted.

b) What are the characteristic curves of a hydraulic turbine? How are they useful to practical engineer?

UNIT - IV

8) a) State and explain Buckingham's Π theorem. Explain Geometric, Kinematic and dynamic similarity.

b) A centrifugal pump is to discharge 0.118 m^3/s at a speed of 1450 rpm against a head 30m. The impeller diameter is 20 cm, its width at outlet is 6 cm and the manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller.

OR

9) a) What are the different efficiencies of a centrifugal pump?

b) A geometrically similar model of scale 1:10 is built to study wave motion on a beach. Determine the scale ratios for velocity, time, acceleration and force if mass densities in the prototype and model are 1030 kg/m^3 and 1000 kg/m^3.

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B.Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

CIVIL ENGINEERING

Paper - VI : Fundamentals of Electrical Science & Mechanical Science

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

Answer question No.1, 6 compulsory   *(15 × 1 = 15)*

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

PART - A

1) a) Define voltage and current. **(1)**

   b) State the working principle for DC Generator. **(1)**

   c) What is the significance of Back e.m.f. of DC motor. **(1)**

   d) What are the main parts of a transformer. Name them. **(1)**

   e) Define 'stress' in over head conductors. **(1)**

   f) On which principle, does the transformer depends upon. **(1)**

   g) Define 'power' and write its units. **(1)**

   h) What is meant by Sag of a transmission line. **(1)**

UNIT – I

2) a) Explain with the help of circuit diagram, the principle and working of half-wave rectifier. **(8)**

   b) Describe the constructional features of a DC machine. **(7)**

OR

3) a) What is Back E.M.F. in a D.C. motor. Derive the torque equation of D.C. motor. **(8)**

   b) Explain the different types of a transformer with a neat sketch. **(7)**

UNIT – II

4) a) Derive the torque equation of a 3-phase induction motor. **(8)**

b) Explain the principle of operation of alternator. Derive its induced EMF equation. **(7)**

OR

5) What are the different types of electrical towers and write the effects on it? **(15)**

PART – B

(MECHANICAL SCIENCE)

6) a) What is meant by slip of the belt drive? **(1)**

b) What is meant by drawing operation? **(1)**

c) Define the term soldering. **(1)**

d) What is meant by casting? **(1)**

e) Write the principle of Gas turbine. **(1)**

f) Give the classification of Gas turbines. **(1)**

g) What are the types of weldings? **(1)**

UNIT – III

7) a) Show that $\dfrac{T_1}{T_2} = e^{\mu\theta}$. **(10)**

b) Explain velocity ratio. Why should it can be calculated. **(5)**

OR

8) Briefly discuss about the principles of five manufacturing processes. **(15)**

UNIT – IV

9) Derive an expression for the length of belt for an open belt drive? **(15)**

OR

10) a) Write about 'multistage air compression'. State its advantages. **(8)**

b) Explain the differences between Impulse and Reaction turbine. **(7)**

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B.Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATION AND MECHANICAL AND CIVIL ENGINEERING

Paper - VII : Environmental Science

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

Answer question No.1 compulsory   *(15)*

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

1) Write short notes on :

   a) Modern agriculture.

   b) Renewable resources.

   c) Food web.

   d) Earth quake.

   e) Endemic species.

UNIT – I

2) Discuss the scope of environmental studies with respect to the following statements.

   a) Our dependence on nature is so great that we cannot live without protecting earth's environment.

   b) Industrial development affects the environment.

OR

3) Discuss uses and over exploitation of mineral Resources.

UNIT - II

4) What do you understand by energy flow in an ecosystem?

OR

5) Discuss the following:

a) Habitat loss

b) Poaching of wild life

c) Hot spots of Biodiversity

UNIT - III

6) Write a short notes on

a) Noise pollution.

b) Soil pollution.

OR

7) How can you, as an individual, prevent Environmental pollution?

UNIT - IV

8) Discuss various measures from unsustainable to sustainable development?

OR

9) Discuss about the

a) Resettlement and rehabilitation of People.

b) Urban Problems related to energy.

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