B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Civil Engineering

CE 010 402—CONSTRUCTION ENGINEERING AND MANAGEMENT (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. Nominal and design mix of concrete.

2. Spider line cracks in plastering.

3. Optimum moisture content in compaction.

4. Critical path method.

5. Employees State Insurance Act.

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Measurement of workability of fresh concrete.

7. Lime and cement plastering.

8. Dynamic compaction.

9. Different types of floats in project management.

10. Role of construction industry in socio-economic conditions.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each question carries 12 marks.

11. Explain different joints in a concrete framed building.

Or

12. What are the methods used for Damp prevention of floors, walls and roofs ?

Turn over

13. How the Geographic location controls the orientation of buildings ? Explain about the orientation of a classroom complex.

Or

14. With neat sketch explain the working of any two large scale each moving equipment.

15. The jobs of a network along with their time estimates are given below. Identify the critical path. What is the expected project length ?

Duration in days	Job	...	1 − 2	1 − 3	1 − 4	2 − 5	3 − 5	4 − 6	5 − 6
	Optimistic	...	1	1	2	1	2	2	3
	Most likely	...	1	4	2	1	5	3	6
	Pessimistic	...	7	6	8	1	14	10	15

Or

16. The precedence relation ships and activities of a project are given below. Draw the CPM network. Tabulate EST, EFT, LST, LFT and floats for each activity.

Activity	...	A	B	C	D	E	F	G	H	I	J	K	L
Preceding	...	—	—	B	A	C	B	F	D, E	E	H	J, I	K, G
Time	...	40	30	15	25	15	25	10	15	15	20	3	3

17. Using the given data Determine the cost duration relationship. Total cost duration relationship. Also draw the least cost network. Project overhead costs are Rs. 1,00,000 per week.

Activity		Normal Duration	Normal cost	Crash Duration	Crash cost
1 − 2	...	4	2,00,000	3	3,50,000
1 − 3	...	8	2,50,000	7	4,00,000
2 − 3	...	5	4,00,000	3	5,00,000

Or

18. Discuss resource allocation, resource smoothing and resource levelling.

19. List the Acts intended for the welfare of workers. Explain any *two* in detail.

Or

20. Explain about Industrial safety. How state ensures the safety workers.

(5 × 12 = 60 marks)

G 1538   (Pages : 2)   Reg. No...................................

Name.................................

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Civil Engineering

CE 010 404—OPEN CHANNEL FLOW AND HYDRAULIC MACHINES (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 marks.

1. What are the conditions for the rectangular channel of the best section ?

2. Write the application of Pitot tube.

3. Brief initial depth and sequent depth for hydraulic jump.

4. Differentiate radial and axial flow turbine.

5. Write a note on air lift pump.

                                                          $(5 \times 3 = 15 \text{ marks})$

Part B

Answer **all** *questions.*
Each question carries 5 marks.

6. State the critical flow condition in five different ways.

7. Explain the various assumptions made in gradually varied flow.

8. Explain the term hydraulic jump with neat sketch.

9. Obtain an expression for the force exerted by a jet of water on a fixed vertical plate in the direction of jet.

10. Explain multistage pump.

                                                           $(5 \times 5 = 25 \text{ marks})$

Part C

Answer **all** *questions.*
Each question carries 12 marks.

11. A rectangular channel of width 4 m is having a bed slope of 1 in 1500. Find the discharge through the channel. Take C = 50.

                                            Or

12. Find the discharge through a trapezoidal channel of width 8 m and side slope of 1 horizontal to 3 vertical. The depth of flow water is 2.4 m and value of Chezy's constant C = 50. The slope of the bed of the channel is given 1 in 4000.

13. Find the slope of the free water surface in a rectangular channel of width 20 m having a depth of flow 5 m. The discharge through the channel is 50 m³/s. The bed of the channel is having a slope of 1 in 4000. Take the value of Chezy's constant C = 60.

Or

14. Explain different methods to measure the discharge through open channels.

15. The depth of flow of water, at a certain section of a rectangular channel of 2m wide, is 0.3 m. The discharge through the channel is 1.5 m³/s. Determine whether a hydraulic jump will occur, and if so, find its height and loss of energy per kilogramme of water.

Or

16. A hydraulic jump forms at the down stream end of spill way carrying 17.93 m³/s discharge. If the depth before jump is 0.80 m, determine the depth after the jump and energy loss.

17. A jet of water moving at 10 m/s impinges on a concave shaped vane to deflect the jet through 120 degrees when stationary. If the vane is moving at 6 m/s, find the angle of jet so that there is no shock at the intet. Make suitable assumptions.

Or

18. Differentiate between :

   (a) Impulse and reaction turbines.

   (b) Radial and axial flow turbines.

19. A single acting reciprocating pump running at 50 r.p.m. delivers 0.01 m³/s of water. If the diameter of piston is 200 mm and stroke length 400 mm. Determine :

   (a) The theoretical discharge ;

   (b) Cd of pump ; and

   (c) Slip and percentage of slip.

Or

20. A centrifugal pump delivers water against a net head of 14.5 metres and a design speed of 1000 r.p.m. The impeller diameter is 300 mm and outlet width 50 mm. Determine the discharge of the pump if the manometric efficiency is 0.95. Take vane angle ϕ = 30°.

(5 × 12 = 60 marks)

G 1550 (Pages : 2) Reg. No........................

Name........................

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Civil Engineering

CE 010 405—SURVEYING—II (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. Explain phase of signals.

2. What do you mean by base net ?

3. List the different methods of locating soundings.

4. What is the principle of total station ?

5. What do you mean by Astronomical triangle ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. What do you mean by strength of figure ?

7. Explain method of correlates.

8. Differentiate between microwave and visible light instruments.

9. Explain the concept of remote sensing.

10. Define and explain celestial sphere.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each full question carries 12 marks.

11. Explain eccentricity of a signal. How would you correct the observations made upon an eccentric signal ?

Or

12. How could you determine the intervisibitily of triangulation stations ? Give in a tabular form the classification of triangulation based upon accuracy.

Turn over

13. Determine the most probable values of the angles of a triangle ABC, where :

$\angle A = 62° 14' 12''$, Weight $= 1$

$\angle B = 48° 12' 14''$, Weight $= 3$

$\angle C = 69° 33' 28''$, Weight $= 2$

Or

14. Find the most probable values of angles α, β, γ from the following observations at one station :—

$\alpha = 38°12' 26.5''$ Weight $= 1$

$\beta = 32° 45' 13.2''$, Weight $= 2$

$\alpha + \beta = 70° 57' 38.6''$, Weight $= 2$

$\alpha + \beta + \gamma = 126° 28' 0.6''$, Weight $= 3$

$\beta + \gamma = 88° 15' 37.8''$, Weight $= 1$

15. Describe the various methods of plotting the soundings.

Or

16. Discuss the principle of electromagnetic distance measurement. Explain how EDM lines are reduced.

17. (a) Explain how do you determine the focal length of the Camera lens of a photo-theodolite.

(5 marks)

(b) The distance from two points on a photographic print to the principal line are 42.36 mm to the left and 38.16 mm to the right. The angle between the points measured with a transit is 30° 45'. Determine the focal length of lens.

(7 marks)

Or

18. The scale of an aerial photograph is 1 cm = 160 m and the size of the photograph is 20 cm × 20 cm. If the longitudinal lap is 65% and side lap = 35%, determine the number of photographs required to cover an area of 232 km².

19. Determine the azimuth and altitude of a star with the following data :—

Latitude of observer   = 48° N

Hour angle of star   = 43°

Declination of star   = 18° 20' N

Or

20. Write notes on :

   (i) Spherical triangle.   (ii) Zenith and Nadis.

   (iii) Declination.   (iv) Right ascension.

(5 × 12 = 60 marks)

G 1562 (Pages : 2) Reg. No.................................

Name...................................

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Civil Engineering

CE 010 406—CIVIL ENGINEERING DRAWING (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Select suitable scale for drawing indicating the same.
Assume suitable data wherever needed, stating the same.
Marks will be given for neatness.
Drawing sheet will be supplied.

Part A

Answer any **one** *question.*
The question carries 30 marks.

1. (a) Draw the plan and cross sectional elevation of a Quarter turn R.C.C. stair to connect between two floor of 3m height difference in a stair room of size 5 m × 6 m.

Or

   (b) Draw the elevation and longitudinal section of a panelled door with wooden frame for an opening of 1200 mm × 2400 mm (1.2 m × 2.4 m) with double sutter having four panels. Clearly name the various members and give their approximate dimensions.

(30 marks)

Part B

Answer the following.
The question carries 70 marks.

2. A site 10 m × 30 m has a nine metre wide road abutting the shorter side. Plan a residence in the site with proper lighting and ventilation in order to satisfy the following requirements specified by the client.

Car porch	—	15 to 20 m²
Front Verandah	—	1.5 to 2 m wide
Living room	—	11 to 15 m²
Dining room	—	11 to 15 m²
Master Bedroom	—	12 to 16 m² + attached toilet
Guest Bedroom	—	12 to 16 m² + attached toilet

Turn over

| Kitchen | — | 10 to 15 m^2 |
| Work Area | — | 6 to 10 m^2 |

One Bed room and a living room in the first floor is expected to construct after a few years.

Draw, Detail plan, cross sectional elevation giving maximum details, front elevation and site plan to suitable scale.

Write appropriate specifications for the work.

(70 marks)

19. A bending moment M applied to a solid round shaft causes a maximum direct stress f at elastic failure. Determine the numerical relation between M and a twisting moment T which acting alone on the shaft civil produce elastic failure, according to following theories of failure :

    (a) Maximum principal stress theory.

    (b) Maximum principal strain theory.

    (c) Maximum strain energy theory.

    (d) Maximum shear stress theory. Take Poisson's ratio = 0.30.

<center>Or</center>

20. (a) Briefly explain Maximum principal stress theory.   (5 marks)

    (b) Explain using the concept of product of inertia, bending stress at a given point in the section due to a given bending moment.

<div align="right">(7 marks)</div>

<div align="right">(5 × 12 = 60 marks)</div>

Part A

Answer **all** *questions.*
Each question carries 3 marks.

1. List the available methods to determine the deflection in determinate beams.

2. State Betti's theorem.

3. What is Absolute maximum bending moment.

4. What is theoretical arch ?

5. State maximum principal strain theory.

<div align="right">(5 × 3 = 15 marks)</div>

Part B

Answer **all** *questions.*
Each question carries 5 marks.

6. Determine the rotation and deflection at the free end of a cantilever beam subjected to u.d.l. over and entire span of length 'l'.

7. Explain Maxwell's theorem of reciprocal deflection.

8. Draw ILD for BM and SF at any point of a Cantilevers beam.

9. Calculate the moment at 5 m. from the left support of a circular arch of span 25 m. with a central rise 5 m, hinged at the crown and springing. It carries a point load of 100 kN at 6 m. from left support.
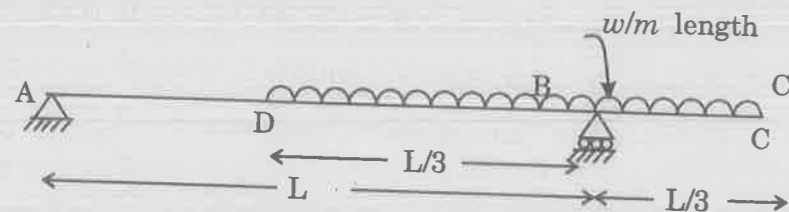
10. Explain the concept of unsymmetrical bending.

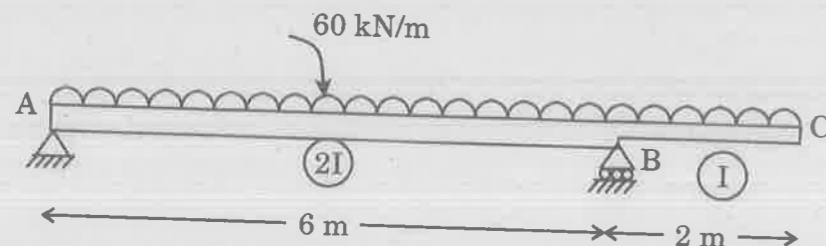<div align="right">(5 × 5 = 25 marks)</div>

<div align="right">**Turn over**</div>

Part C

*Answer **all** questions.*
Each full question carries 12 marks.

11. Determine the rotation and deflection at the free end in the over handing beam given below using conjugate beam method.


w/m length

Or

12. Determine the rotation at A and deflection at C in the overhanging beam shown in fig. below :


60 kN/m

13. A beam of uniform section is of length 2 l and is simply supported at the ends and by an elastic prob at the centre. If the prob deflects by and times the load it carries and if the beam carries a total u.d.l. of W, find the carried by the prob.

Or

14. Find the strain energy stored by the loaded truss in fig. All members have the same sectional area A and Young Modulus E. Find also the vertical deflection of joint B.
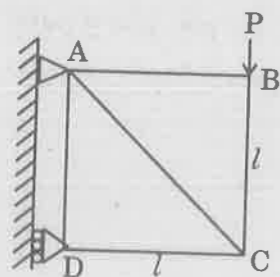

AE is Constant

15. A train of 5 wheel loads as in fig. crosses a simply supported beam of span 22.5 m. :

60kN   80kN   200kN   130kN   120kN

2.5m   2.5m   2.5m   2.5m
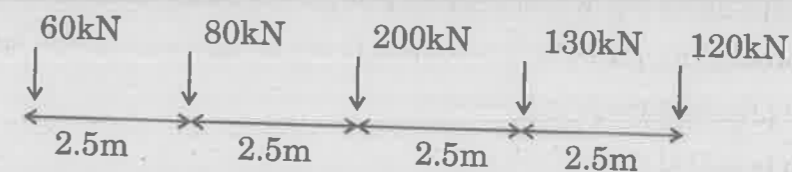
Calculate the maximum positive and negative shear force values of the Centre of the span, and the absolute maximum bending moment anywhere in the span.

Or

16. For the span shown in the sketch below, obtain the bending moment at a section p, 20 m. from A due to loads as shown below :

80kN   80kN   160kN   180kN   170kN

6m   5m   6m   7m

20m   30m
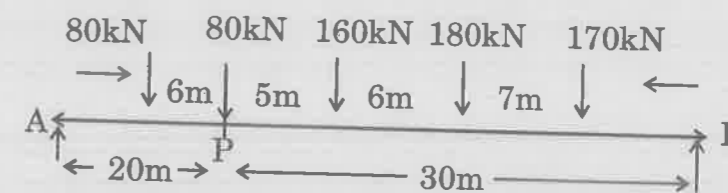
Also determine the position of the leads for maximum bending moment of section P and the value of maximum moment.

17. The Cables of suspension bridge have a span of 60 m. and a central dip of 7.5 m. Each cable is stiffened by a girder hinged at the ends and also at the middle so as to retain a parabolic shape for the Cables. The girder is subjected to a dead load of 10 kN/m. and a live load of 20 kN/m, 15 m. long. Find the maximum tension in the Cable when the leading edge of the live load is just at the centre of the girder. Draw also SF and BM diagrams for the girder.

Or

18. A three hinged circular arch hinged at the springing and crown points has a span of 40 m. and a central rise of 8 m. It carries a u.d.l. of 20 kN/m. over the left half of the span together with a concentrated load of 100 kN at the right quarter span point. Find the reaction at the supports, normal thrust and shear at a section 10 m. from the left support.

Turn over