G 5478 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Branch : Civil Engineering

CE 010 404—OPEN CHANNEL FLOW AND HYDRAULIC MACHINES [CE]

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. State and explain Manning's formula for open channel flow.
2. Explain the working of Pitot tube.
3. Explain efficiency of hydraulic jump.
4. Explain the working of a draft tube.
5. Explain specific speed of pump.

(5 × 3 = 15 marks)

Part B

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

6. Explain specific force in open channel flow.
7. Explain conveyance of canal cross-section.
8. Discuss different forms of the dynamic equations for open channel flow.
9. Explain velocity triangle for Penton turban.
10. Explain multi stage pumps.

(5 × 5 = 25 marks)

Part C

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

11. Find the velocity of flow and rate of flow of water through a rectangular channel of 6 m. wide and 3 m. deep, when it is running full. The channel is having bed slope as I in 2000. Take Chezy's constant C = 55.

Or

12. A trapezoidal channel has side slopes of 1 horizontal to 2 vertical and the slope of the bed is I in 1500. The area of the section is 40 m^2. Find the dimensions of the section if it is most economical. Determine the discharge of the most economical section if C = 50.

13. The specific energy for a 5 m. wide rectangular channel is to be 4 kg.-m./kg. If the rate of flow of water through the channel is 20 m^3/sec., determine the alternate depths of flow.

Or

14. The depth of flow of water, at a certain section of a rectangular channel of 4 m. wide, is 0.5 m. This discharge through the channel is 16 m^3/sec. If a hydraulic jump takes place on the downstream side, find the depth of flow after the jump.

15. Find the rate of change of depth of water in a rectangular channel of 10 m. wide and 1.5 m. deep, when the water is flowing with a velocity of 1 m./sec. The flow of water through the channel of bed slope 1 in 4000, is regulated in such away that energy line is having a slope of .00004.

Or

16. Determine the length of the back water curve caused by an afux of 2.0 m. in a rectangular channel of width 40 m. and depth 2.5 m. The slope of the bed is given as 1 in 11000. Take Manning's N = .03.

17. A jet of water of diameter 7.5 cm. moving with a velocity of 25 m./sec. strikes a fixed plate in such a way that the angle between the jet and plate is 60°. Find the force exerted by the jet on the plate : (i) in the direction normal to the plate ; and (ii) in the direction of the jet.

Or

18. A pelton wheel has a mean bucket speed of 10 meters per second with a jet of water flowing at the rate of 700 liters/sec. under a head of 30 meters. The buckets deflect the jet through an angle of 160°. Calculate the horse power and the efficiency of the turbine. Assume coefficient of velocity as 0.98.

19. A centrifugal pump is to discharge 0.118 m^3/sec. at a speed of 1450 r.p.m. against a head of 25 m. The impeller diameter is 25 cm., its width at outlet is 5 cm. and manometric efficiency is 75 %. Determine the vane angle at the outer periphery of the impeller.

Or

20. A double acting reciprocating pump, running at 40 r.p.m., is discharging 1.0 m^3 of water per minute. The pump has a stroke of 40 cm. The diameter of the piston is 20 cm. The delivery and suction heads are 20 m. and 5 m. respectively. Find the slip of the pump and horse power required to drive the pump.

(5 × 12 = 60 marks)

G 5490 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Branch : Civil Engineering

CE 010 405—SURVEYING—II [CE]

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the selection of triangulation stations.
2. Explain the laws of weights in triangulation adjustments.
3. List hydro graphics survey equipments.
4. Discuss general principals of terrestrial photogrammatric survey.
5. Explain the term spherical excess.

(5 × 3 = 15 marks)

Part B

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

6. Explain satellite station.
7. Explain the determination of most probable value of quantities.
8. Explain the principal of EDF.
9. Explain photo theodolite.
10. Explain Celestial sphere.

(5 × 5 = 25 marks)

Part C

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

11. The altitude of two proposed stations A and B 100 km. a part are respectively 250 meters and 600 meters. Intervening obstruction situated at C, 50 km. from A has an elevation of 300 m. check if A and B are invisible, and if necessary find how much B should be raised on that the line of sight nowhere be less than 3 m. above the surface of the ground.

Or

12. The attitude of two proposed triangulation stations A and C, 100 km. apart, are 210 m. and 1000 m. respectively above the level datum, while the heights of two eminences B and D on the profile between A and C are 350 and 650 m. respectively. The distance AB and AD being 40 km. and 70 km. respectively. Ascertain if A and C are intervisible and, if necessary, determine suitable height of a scaffold at C, given that A is a ground station. The earth's mean radius may be taken as 6250 km. and coefficient of refraction 0.07.

13. If angles A = 48°18′10″ has weight 3 and B = 30°40′50″ has weights two determine the weight of the angles A-B, A/3, 2B, 3A and B/2. Explain the principal adopted.

Or

14. The observations closing the horizon at a station are :

A =	24°22′18″.2	weight 1
B =	30°12′24″.4	weight 2
A + B =	54°34′48″.6	weight 3
C =	305°35′13″.9	weight 2
B + C =	335°37′38″.0	weight 3

Find the most probable values of the angles A, B and C.

15. What is a total station ? Illustrate the fundamental measurements that can be made using a station. Briefly explain how horizontal and vertical distances are computed from total station observations.

Or

16. (a) Explain how the soundings are located by :
    (i) Two angles from the shore.
    (ii) Intersecting ranges.
    (b) Derive the analytical solution of the three point problem.

17. Define focal length of lens. Explain the determination of focal length of a lens.

Or

18. A line AB appears to be 10.05 cm. on a photograph for which the focal length of the camera is 16.2 cm. The corresponding line measures 2.52 cm. on a topographic map having a scale of 1 : 50000. The terrain has an average elevation of 250 m. above the means sea level. Calculate the flying height of the aircraft when the photograph was taken.

19. (a) Define and draw the following with neat sketches (i) Declination ; (ii) Hour angle ; and (iii) Right ascension.
    (b) Calculate the local apparent time of an observation taken at local mean time 10 hr. 30 min. at longitude 78°30°E. The equation of time at GMN is 3 min 4.52 sec. subtractive from the apparent time and decreasing at the rate of 0.3 sec/hour.

Or

20. Define time and azimuth. Explain the determination of time and azimuth.

(5 × 12 = 60 marks)

G 5502

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Branch : Civil Engineering

CE 010 406—CIVIL ENGINEERING DRAWING [CE]

(New Scheme—2010 Admission onwards)

[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 sheets will be supplied.

Part A

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

1. Draw to a suitable scale the plan and elevation of a panelled door with wooden frame for an opening of 1000 mm. × 2200 mm. with double shutter having three panels. Clearly name the various members and give their approximate dimensions.

Or

2. Draw the elevation and details at support of a steel roof truss of clear span 16 m. Thickness of support is 30 cm. Roof has profile sheet roofing of 1 : 5 slope.

(30 marks)

Part B

Answer the following questions.
The question carries 70 *marks.*

3. Design and draw plan, elevation and suitable section of a residential building having the following accommodation :

Drawing room	-	4.5 × 3.6
Bed room (2)	-	3.6 × 3.5 + bath and toilet
Office room	-	3.6 × 3.0
Dining room	-	3.6 × 3.0
Kitchen	-	3.6 × 3.0 + work area and toilet
Guest	-	3.6 × 3.0 + Bath and toilet

Building can be design as single storey and two stored.

(70 marks)

G 5459

(Pages : 3)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Branch : Civil Engineering

CE 010 402—CONSTRUCTION ENGINEERING AND MANAGEMENT (CE)

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Each question carries 3 *marks.*

Write short note on the following :—

1. Admixtures in concrete.
2. Intelligent buildings.
3. Bar chart.
4. Resource leveling.
5. Industrial safety.

(5 × 3 = 15 marks)

Part B

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

6. Workability of concrete.
7. Orientation of buildings.
8. Time estimate.
9. Resource allocation.
10. Minimum wage Act.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. Explain with neat sketches different types of construction joints.

Or

12. Explain Damp and Damp prevention. Discuss damp proofing of floors.

13. Explain the procedure for functional planning.

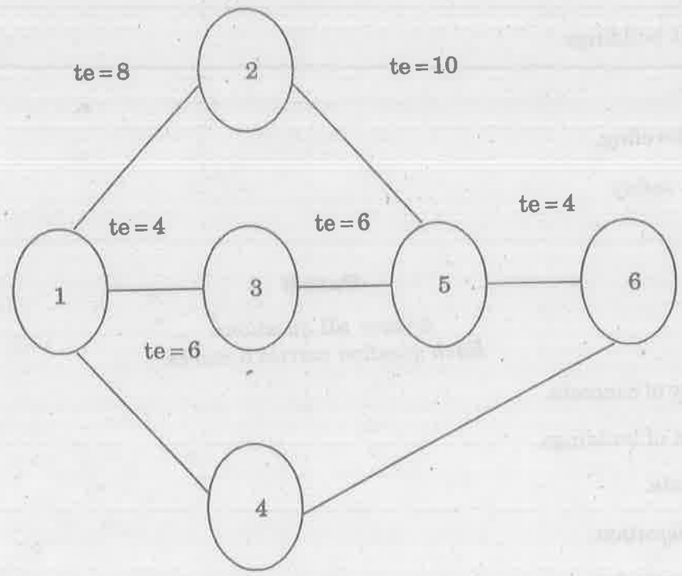
Or

14. Briefly explain soil compaction and stabilization.

15. A coconut tree climber takes less than 20 minutes for climbing a tree. 15 minutes climb is more frequent than climbing any other duration. If climbing of tree is an activity PERT project. What will be the climbing expected duration, its variances and allocation of time.

Or

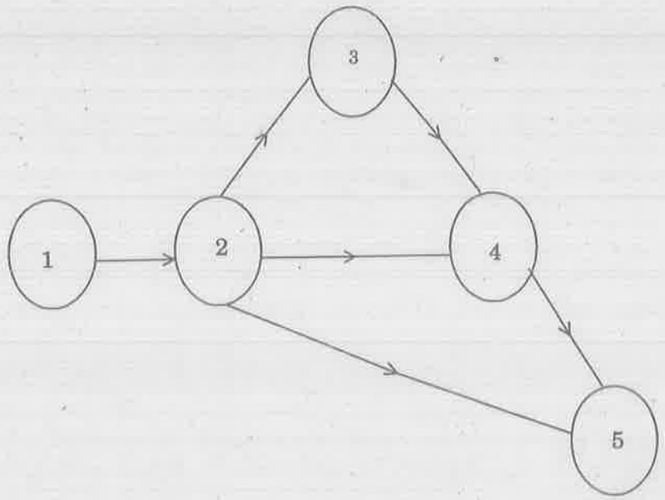
16. Show the Earliest and latest expected times on the following network and also indicate the critical path on it.



17. Briefly explain project cost analysis.

Or

18. For a network shown below, Normal time, Crash time, Normal cost and crash costs are given in the table. Contract the network by crashing it to optimum value and calculate the optimum project cost. Indirect cost is given as Rs. 1,000 per day.



Activity	*Normal*		*Crash*	
	Time in days	*Cost in* Rs.	*Time in days*	*Cost in* Rs.
1-2	3	300	2	400
2-3	6	480	4	520
2-4	7	2100	5	2500
2-5	8	400	6	600
3-4	4	320	3	360
4–5	5	500	4	520

19. Define wages and explain factors influencing wages.

Or

20. Worker is employed for manufacture of M.S. pins at a piece rate of 20 Rupees. He has to prepare 40 pins in 8 hours of work, but he prepared 55 pins in 8 hours. Calculate his total daily earning by piece-rate system.

(5 × 12 = 60 marks)

19. A rectangular block of material is subjected to a tensile stress of 120 N/mm^2 on one plane and a tensile stress of 50N/mm^2 on a plane at right angles to it, together with shear stresses of 60N/mm^2 on the same planes. Find (i) Magnitudes of the principal stresses ; (ii) Direction of principal planes ; (iii) Magnitude of the greatest shear stress and its direction.

Or

20. A beam 3 m long of I-Section is freely supported at its ends with the vertical. It carries concentrated loads of 100kN. At 0.6 m. from each end. The flanges are each 150 mm wide and 25 mm thick, the overall depth being 400 mm. The thickness of the web is 12.5 mm. Calculate the principal stresses and the maximum shearing stress in a section of the beam where the bending moment and shearing force, both have maximum values.

(5 × 12 = 60 marks)

G 5466 **(Pages : 4)** **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Civil Engineering

CE 010 403—MECHANICS OF SOLIDS—II (CE)

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. State the differential equation of the elastic curve of a beam.
2. Define strain energy.
3. Define influence line for reaction.
4. Explain support reaction.
5. Define polar moment of inertia.

(5 × 3 = 15 marks)

Part B

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

6. Explain deflection due to shear.
7. State Cstigliano's first theorem.
8. Explain absolute maximum bending moment under moving load.
9. State and explain Eddy's theorem.
10. Explain the concept of unsymmetrical bending analysis.

(5 × 5 = 25 marks)

Part C

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

11. Find the maximum deflection for the beam loaded as shown in Fig I.

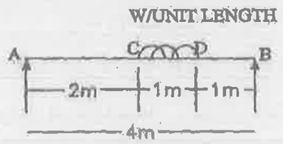


fig. (I)

Or

12. A simply supported and uniformly loaded wooden beam of square cross-section has span of 3 m. Find the maximum deflection if maximum bending stress is 1000kg/cm^2 E = 2 × 10^6 kg/cm^2 w = 6000 kg/m.

13. Find the forces in various members of the cantilever truss shown in Fig II.

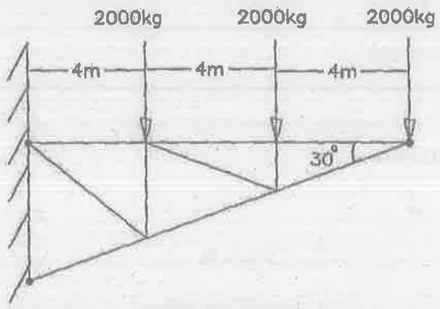


fig. (II)

Or

14. Determine the horizontal and vertical displacement at the free end D of the frame shown in Fig (III), take EI 15 × 10^{10} kN.mm^2.

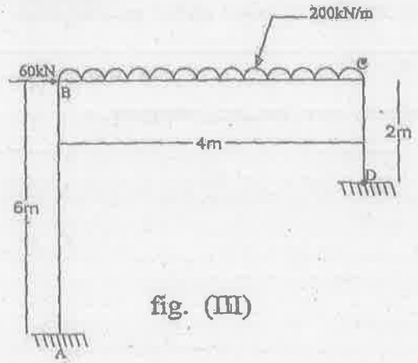


fig. (III)

15. Draw influence line for forces in members L_1, U_2, L_1 L_2 and U_1 U_2 of the truss shown in Fig (IV) for unit load moving on the bottom boom. Hence determine the maximum force in these members due to uniformly distributed live load of 4000kg/m (longer than span) and dead load of 2000 kg/m.

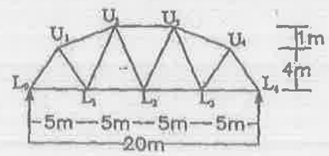


fig. (IV)

Or

16. Drawn influence line for force in members U_3 U_4 and L_4 L_6 of the warren girder shown in Fig (V). Determine the maximum load in the members when train of loads shown in the figure crosses the span.

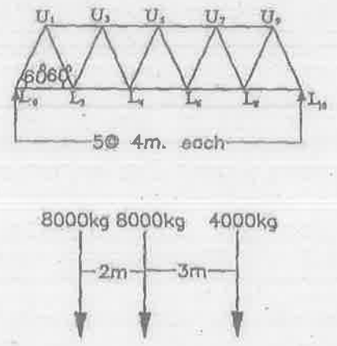


fig. (V)

17. A three hinged parabolic arch has a span of 22 m. and a rise of 4.5 m. It carries a point load of 120 kN at 5 m. from the left end and a uniformly distributed load of 2kN/m. Over the right half of the span. Find the bending moment, normal thrust and radial shear at a section 4 m. From the right end.

Or

18. Three-hinged stiffening girder of a suspension bridge of span 120 m is subjected to two point loads of 240 kN and 300 kN at distances 25 m and 80 m from the left end. Find the shear force and bending moment for the girder at a distance of 40 m from the left end. The supporting cable has a central dip of 12 m. Also find the maximum tension in the cable and draw the BM diagram for the girder.

Turn over