Register Number :

Name of the Candidate :

3 8 0 4

B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

01PC-502. SURVEYING - II

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL Marks.

UNIT - I

1. (a) Explain the parts of transit thieodolite. (7)

   (b) Explain the temporary adjustment of a transit theodolite. (8)

(OR)

2. (a) Explain the procedures involved in measuring the followings, using theodolite : (8)

   (i) Horizontal angle by repetition method. (ii) Vertical angle.

   (b) What is the different error in theodolite work ? (7)

UNIT - II

3. The following readings were taken on a vertical staff with a tacheometer fitted with an analytic lens and having a constant of 100.

Staff station	Bearing	Staff readings			Vertical angles
A	47° 10′	0·940	1·500	2·060	8° 0′
B	227° 10′	0·847	2·000	3·153	−5° 0′

(OR)

4. A tacheometer is setup at an intermediate point on a traverse course PQ. The following obsevations are made on the vertically held staff.

Staff station	Vertical angle	Staff intercept	Arcial hair reading
P	8° 36′	2·350	2·105
Q	606′	2·055	1·895

UNIT - III

5. Elaborate the element of reverse curve in detail with suitable sketch.

(OR)

6. Two straight proposed road deflect through an angle of 120° originally, they were to be connected by a curve of 520 m radius. However due to the revision of the scheme the deflection angle is be increased to 132°. Calculate the suitable radius of the curve such that the original starting point of the curve (P.S.) does not change.

UNIT - IV

7. Explain the classification of triangulation system.

(OR)

8. Two triangulation stations A and B are 60 km apart and have elevation 240 m and 280 m respectively. Find the maximum height of signal required at B so that the line of sight may not pass near the ground than 2 m. The intevening ground may be assumed to have a uniform elevation of 200 m.

UNIT - V

9. Explain the types of electromagnetic distance measurement instrument.

(OR)

10. Explain the total station and give the fundamental measurements.

B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

CLEC–502/PCLEC–102: SURVEYING – II

(Common with Part-Time)

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit   (5 × 15 = 75)

UNIT – I

1. Write in detail about principles and advantages of stadia tachometric.

2. Discuss in detail with neat sketchs about the parts of box sextant and what are the errors occur while using.

UNIT – II

3. Describe the detail procedure of setting out the simple curves by chain and tape method.

4. Elaborate the elements of compound curves in detail with suitable sketch.

UNIT – III

5. Discuss the various methods of arranging the triangles and mention the different criteria for the selection of the arrangement of triangles.

6. Describe in detail about satellite station and reduction to centre.

UNIT – IV

7. Enumerate the principle of least squares as applied to observations of equal weight and to those for which different weights are assigned.

8. What do you mean by station adjustments? Explain it briefly.

UNIT – V

9. Calculate the Sun's Azimuth and Hour angle at sunset at a place in Latitude 52°N, When its Declination is (i) 20°N and (ii) 14°S.

10. Explain briefly about spherical triangle and its elements.

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B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

CLEC–503/PCLEC–105: STRUCTURAL MECHANICS – I

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit   (5 × 15 = 75)

UNIT – I

1. With a neat sketch, explain about arriving moments by Theorem of three moments method.

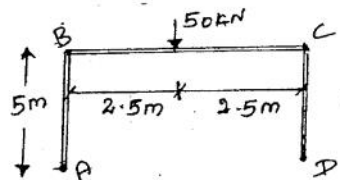2. Using column analogy method, draw the bending moment diagram for the frame shown in Fig.No.1.

Fig.1

UNIT – II

3. Determine the influence line for the reaction at A for the continuous beam as shown in Fig.No.2. Compute the ordinates at every 1m interval.
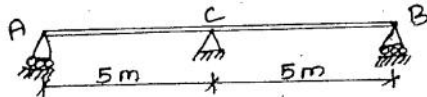

Fig.2

4. A simply supported beam has a span of 15m uniformly distributed load of 40kN/m and 5m long crosses the girder from the left to right. Draw the influence line diagram for shear force and bending moment at a section 8m from the left.

UNIT – III

5. A parabolic three hinged arch of span 30m and central rise 7.5m carries Uniformly distributed load of 30kN/m over the entire right half portion. It also carries two point loads of 30kN and 35kN at 3m and 7m from the left support respectively. Determine the resultant reaction at supports and find the bending moment, normal thrust and radial shear at 7.5m from left support. Also find the intensity of maximum bending moment.

6. A two hinged parabolic arch has a varying moment of inertia given by $I = I_0 \sec\theta$. The span of arch is 30m and central rise 7.5m. Calculate the maximum positive and negative bending moment at a section 7.5m from the left support due to a rolling point load of 10kN.

UNIT – IV

7. A symmetrical three pinned girder of suspension bridge is 220m long. Determine the magnitude of largest bending moment that can be exerted by a moving load 200kN uniformly distributed over a length of 10m. indicate the position of the for this condition.

8. Drive from principle of the bending moment diagram from symmetrical suspension bridge with three hinged stiffening girder of length 'L' subjected to a point load 'W' at a distance 'X' from the central hinge. Draw to scale the Bending moments diagram under the load.

UNIT – V

9. Analyse the frame as shown in Fig.No.3 and sketch the bending moment diagram.
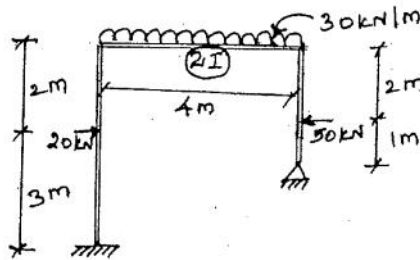

Fig.3

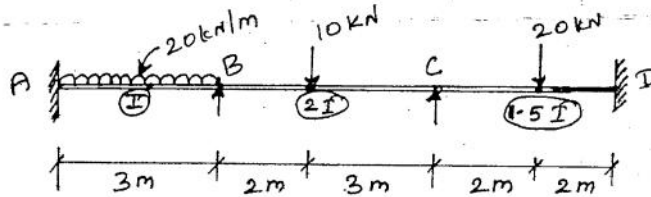10. Analyse the beam girder by moment distribution method and draw bending moment diagram.

Fig.4

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B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

02PC–504: STRUCTURAL CONCRETE DESIGN – II

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit   (5 × 15 = 75)
(Relevant IS codes are permitted – IS 456 – 2000)
(SP 34: 1987 is permitted)

UNIT – I

1. Design the beam of a portal frame which is subjected to the (15) following design forces: Negative moment at junction = 180 KN-m positive moment at mid span = 260 KN-m, shear near junction with column = 240 KN, slab thickness over the beam = 120 mm.

2. Explain in brief:

    (i) Load combinations for gravity and later loads   (8)

    (ii) Analysis of Building frames.   (7)

UNIT – II

3. Explain the necessity of using raft foundations. Under what situations (15) you would resort to use of raft foundations.

4. Design a combined column footing with strap beam for two reinforced (15) concrete columns 200 mm by 200 mm size spaced 4 m apart and each supporting a service load of 300 KN. The safe bearing capacity of soil is 150 KN/m². Adopt M25 grade and Fe415 grade steel.

UNIT – III

5. A RC column 400 mm × 400 mm carrying a service load of 800 KN is (15) supported on three piles 300 × 300 mm in section. The centre to centre distance is 1500 mm. Design the reinforcement in the pile and a pile cap. The length of the piles may be 6 m on hard rock. Adopt M20 grade and Fe415 grade steel.

6. What are the design considerations to be followed in the designing pile (15) caps? How do you fix the depth of a pile cap?

UNIT – IV

7. Design an open rectangular tank of size 3m × 8m × 3m deep resting on (15) a firm ground. Use M25 grade concrete and Fe415 steel. Approximate method may be used for analysis.

8. Design a circular water tank with flexible base resting on the ground to (15) store 50,000 litres of water. The depth of tank is 5m. Use M25 concrete and Fe415 steel.

UNIT – V

9. Explain the structural behaviour of various elements of reinforced (15) concrete retaining wall.

10. Explain with neat sketches, the deformation characteristics of the (15) various structural elements of cantilever retaining wall.

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Register Number:

Name of the Candidate:

4132

B.E. DEGREE EXAMINATION, 2018

(PART-TIME)

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

PCLEC-504: IRRIGATION STRUCTURE AND WATER POWER ENGINEERING

November]   [Time: 3 Hours

Maximum: 75 Marks

Answer any ONE FULL question from each unit   *(5×15=75)*

UNIT – I

1. Discuss the types of irrigation with neat sketches.

2. Discuss the various merits and demerits of irrigation.

UNIT – II

3. Explain the diversion head works, its components and its uses.

4. Explain in detail Khoslas theory for design of canals.

UNIT – III

5. Explain the various forces acting on gravity dam.

6. Discuss the various points to be taken while selecting site for a dam.

UNIT – IV

7. Discuss the various causes of water logging.

8. Explain the advantages of canal lining.

UNIT – V

9. Explain the design principles of canal regulator.

10. Discuss the low head and medium head installations.

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Register Number:

Name of the Candidate:

3865

B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

CLEC–504/PCLEC–302: SOIL MECHANICS

(Common with Part-Time)

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

UNIT – I

1. Explain the following terms in detail:
   a) Degree of saturation
   b) Percentage air voids
   c) Porosity
   d) Absolute specific gravity
   e) Mass specific gravity.

2. A sample of saturated soil has water content of 25% and a bulk unit weight of 20kN/m³. Determine dry density, void ratio and specific gravity of solid particles. What would be bulk unit weight of same soil at same void ratio but at a degree of saturation of 80%. Take v_w = 10 kN/m³.

UNIT – II

3. A Sand deposit 10m thick and overlies a bed of soft clay. The ground water table is 3m below ground. If sand above ground water table has a degree of saturation 45% plot diagram showing variation of total stress, pore water pressure and the effective stress. Take e = 0.7, G = 2.65.

4. Explain in detail about flow net and its properties.

UNIT – III

5. Write short notes on: (i) Influence charts, (ii) Soil water, (iii) Flow through static media.

6. Discuss in detail the effective stress concept in dry and saturated soils.

UNIT – IV

7. Write the merits and demerits of Direct Shear Test and Triaxial Test.

8. Discuss in detail about Mohr's Coulomb strength envelope.

UNIT – V

9. Discuss the various methods used to find stability analysis of soil slopes.

10. Explain the remedial measures for slope failures and mechanism of slope failure.

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B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

CLEC- 505. STRUCTURAL ENGINEERING -II

November]   [Time: 3 Hours

Maximum: 75 Marks

Answer One Full Question from each Unit.   *(5 × 15 = 75)*

UNIT – I

1. Explain the procedures of analysis and design of portal frames.

2. Discuss the design procedure of analysis of multistory frames subjected to gravity and wind loads.

UNIT – II

3. Designs a counter fort retaining wall for the following data height of the wall above the ground level = 5m

   SBC of the soil = 165 kN/m²

   Angle of friction =33°

   Densities of soil =16kN/m³

   spacing of the counter fort=3m C/C

   Use M25 grade concrete and Fe415 steel.

4. Design a reinforced concrete cantilever type retaining wall, having a 6m full stem. The wall retains the soil with its top. The soil weight 15000 N/m³, and has an angle of repose 30°: the SBC of soil is 250 kN/m². Use M20 and Fe415

UNIT – III

5. Design a rectangular RC water tank resting on the ground for a capacity of 10,00,000 ltrs. Design also the side walls of the tank using the following data: Dimension of tank=8m×5m; Use M20 Grade concrete and Fe415 sted. Assume necessary datas.

2

6. A Circular types RC water tank of 5m ϕ and 3 m height is supported by a tower consisting of 6 RC columns on a circle of 5 m dia. The tank is to be designed to hold water up to a depth of 2.75m. design a suitable water tank for the following data. Height of tower=12m, spacing of bracings =4m, intensity of wind pressure=1.5kN /m² SBC of soil at site=150kN/m², use m20 and Fe415 grades and assume suitable datas.

UNIT – IV

7. Explain the design procedure for a solid slab bridge design.

8. Design a rectangular deck slab 7m×5m in size and simply supported at the edges to support a service live load of 5 kN/m². Assume co-efficient of orthotrophy as 0.8. Use m20 grade concrete and Fe415 grade steel.

UNIT – V

9. Explain the various types of industrial buildings and draw neatly.

10 Explain the Analysis and design of a roof Trees.

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B.E. DEGREE EXAMINATION, 2018
(CIVIL ENGINEERING)
(FIFTH SEMESTER)
01PE–505: HYDROLOGY

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit   (5 × 15 = 75)
UNIT – I

1. Explain the hydrological cycle with a neat sketch, and state the (15)
   hydrologic equation and its importance in Civil Engineering.

2. a) Explain about global water budget.   (8)
    b) Write about meteorological observations.   (7)

UNIT – II

3. Explain the various methods of measuring the average rainfall over a (15)
   basin.

4. Explain the various types and forms of precipitation in detail.   (15)

UNIT – III

5. An infiltration test was conducted on a ring with 35 cm diameter (15)
   yielded the following data.

Time from the starts, minutes	0	2	5	10	20	30	60	90	150	210
Cumulative vol. of water added cm³	0	278	658	1173	1924	2500	3345	3875	4595	5315

   Determine the infiltration capacity rates form the time intervals in the
   experiment. And what is the average infiltration capacity for the first
   10 minutes and for the first 30 minutes of the experiment.

6. i) Explain the factors affecting the evaporation.   (9)
    ii) Discuss the methods adopted for reducing evaporation.   (6)

UNIT – IV

7. Explain the method for the derivation of synthetic unit hydrograph (15)
   with examples.

8. The ordinates of a four unit hydrograph of a basin of area 300 km², (15)
   measured at one hour interval are 6, 36, 66, 91, 106, 93, 79, 68, 58,
   49, 41, 34, 27, 23, 17, 13, 9, 6, 3 and 1.5 m³/s resp. Obtain the
   ordinates of a 3 hour unit hydrograph for the basin using S curve
   technique.

UNIT – V

9. a) Explain the Gumbels method for flood routing.   (8)

    b) Write briefly about maximum probable flood and spatial probable (7)
    flood.

10. Explain the method of determining the Muskingumparameters K and x (15)
    of a reach from a pair of observed inflow and outflow hydrographs.

B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(FIFTH SEMESTER)

CLEC–506: TRANSPORTATION ENGINEERING – II
(Common with Part-time)

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit   (5 × 15 = 75)

UNIT – I

1. Discuss about historical development of Indian Railways.

2. Write short notes on following:

    (i) Break of gauge   (ii) Standard gauge   (iii) Cape gauge.

UNIT – II

3. Describe the main constituents of a crossing. Draw the neat sketches to show a point rail and a splice rail.

4. Draw the neat sketch of diamond crossing and list its important features.

UNIT – III

5. Briefly describe the construction cycle for tunneling. How are drainage facilities provided in tunnels?

6. Why it is necessary to maintain a tunnel? Describe the various inspections carried out to ensure the tunnels are properly maintained.

UNIT – IV

7. What are the requirements of signals used in harbours? Elaborate in detail about the types of these signals.

8. Elaborate the various forms of harbour in detail.

UNIT – V

9. Explain any one of the dredging method in detail with suitable sketches.

10. Elaborate the design consideration and merits and demerits of jetties.

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