F 3613

Reg. No....................................

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

B.TECH. DEGREE EXAMINATION, NOVEMBER 2016

Fifth Semester

Branch : Civil Engineering

CE 010 502—COMPUTER PROGRAMMING (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. Write the format for conditional operator.

2. What is the scope and life-time of variables ?

3. What are multi-dimensional arrays ? How are they used ?

4. What are the advantages of linked list over arrays ?

5. What is the difference between getc and getw functions ?

(5 × 3 = 15 marks)

Part B

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

6. What is meant by precedence of operators ?

7. What is the difference between parsing by value and parsing by reference ?

8. Write a note on different arithmetic operations on strings.

9. Which are the different ways of definining structure and its variables ?

10. Briefly explain, how files are handled in C programming ?

(5 × 5 = 25 marks)

Part C

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

11. (a) Explain the different control statements with examples.   (6 marks)

    (b) What are user defined data types ?   (6 marks)

Or

Turn over

12. (a) Which are the different types of constants in C programming ?   (4 marks)

    (b) Write a program to print the numbers that are divisible by 7 & 9 and lies between 1 to 100.

                                                                                         (8 marks)

13. (a) What are macros ?   (4 marks)

    (b) Which are the different category of functions ?   (8 marks)

Or

14. Write a program to find factorial of a number, n.

15. Write the steps in programming to find the transpose of a matrix.

Or

16. Which are different string handling functions ?

17. Explain the different memory allocation functions.

Or

18. Explain, how sorting of structure is done ?

19. With an example, explain random access to files.

Or

20. Which are the different errors possible and how it is handled during input-output operations on file ?

                                                           [5 × 12 = 60 marks]

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(Pages : 3)

Reg. No.............................

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

B.TECH. DEGREE EXAMINATION, NOVEMBER 2016

Fifth Semester

Branch : Civil Engineering

CE 010 505—QUANTITY SURVEYING AND VALUATION (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Assume any missing data suitably.

1. (a) (i) Estimate the quantity of the following items of the given residential building (Fig 1.1 on page 3).

    — Earthwork excavation for foundation. (10 marks)

    — Wood works. (10 marks)

    (ii) Estimate the quantity of the following items of a residential building (Fig 1.1 on page 3) and based on that prepare the abstract of estimated cost.

    — 12 mm thick inner and outer plastering in CM 1 : 6 for walls. (20 marks)

Or

(b) Estimate the quantity of following items of the given residential building (Fig 1.1 on page 3) and based on that prepare the abstract of estimated cost :

    — First class brickwork in CM 1 : 6 for foundation. (10 marks)

    — First class brickwork in 1 : 2 lime mortar for super structure. (10 marks)

    — RCC work for lintels and roof slab. (10 marks)

    — White washing the walls inside and outside. (10 marks)

2. (a) (i) Prepare conveyance statement for the transfer of building materials for the construction of a residential building (R.R. stone for foundation work and steel) from main road to the site 1 km apart. (10 marks)

    (ii) Write down detailed specification for the following items for work :

    — RCC 1 : 2 : 4 for roof concreting. (5 marks)

    — Painting on metal. (5 marks)

Or

(b) (i) Explain in detail different types of conveyance. (5 marks)

    (ii) Write down detailed specification for the following items of work :

    — Centering and shuttering. (5 marks)

    — Decorative cement colour washing. (5 marks)

    — Laterite work in CM 1 : 4 for superstructure. (5 marks)

Turn over

3. (a) Workout the labour requirements, material ingredients and rate analysis for the following items of work using local prevailing rates :

   – 12 mm plastering CM 1 : 6 (100 sqm).   (10 marks)

   – Brickwork in CM 1 : 4 for super structure.   (10 marks)

Or

   (b)   – Cement pointing CM 1 : 2 (100 sq.m.)   (10 marks)

          – R.R. masonry in foundation including earthwork (10 cum)   (10 marks)

4. (a) A coloniser intends to purchase a land of 1,00,000 m^2 area located in the suburb of a big city to develop it into 500 sq.m. plots after providing necessary roads and parks and other amneties. The current sale prize of small plots in the neighbourhood is Rs. 300.00 per m^2. The coloniser wants a net profit of 20%. Work out the maximum price of the land at which the coloniser may purchase the land.

(10 marks)

Or

   (b) A Government employee drawing a salary of Rs. 30,000 month occupy a quarters having a plinth area of 150 m^2. Prevailing cost of construction per m^2 is Rs. 15,000. Calculate and suggest the amount of monthly house rent payable by the employee.

(10 marks)

5. (a) A three storied building is standing on a plot of land measuring 800 m^2. The plinth area of each storey is 400 m^2. The building is RCC framed structure and the future life may be taken as 70 years. The building fetches a gross rent of 12,000 per month. Workout the capitalised value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken as 800 per m^2. Outgoings are as under' :

   (i) Repair – 1/12th of gross income.

   (ii) Taxes – 12% of gross income

(10 marks)

Or

   (b) In a plot of land costing Rs. 50,00,000 a building has been newly constructed at a total cost of Rs. 85,00,000 including sanitary and water supply works, electrical installation etc. The building consists of 8 flats and for 8 tenats. The owner expects 8 percentage return on the cost of construction and 5% return on the cost of land. Calculate the standard rent for each flat of the building assuming :

   The life of the building as 60 years and sinking fund will be created on 4% interest basis.

   Annual repairs cost at 1% of the cost of construction.

   Other outgoings including taxes at 30% of the net return on the building.

(10 marks)

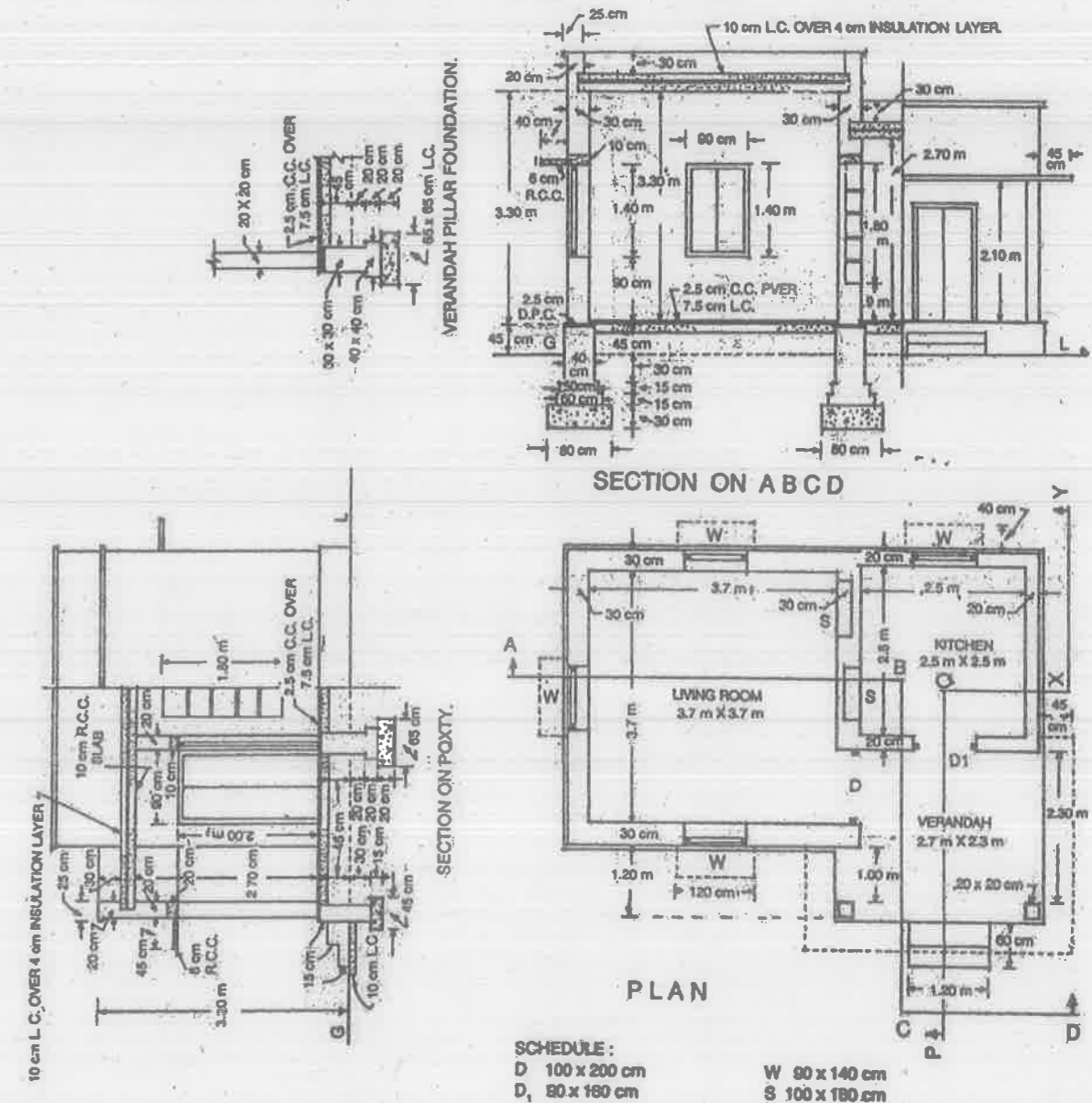## SINGLE ROOM QUARTERS WITH KITCHEN AND VERANDAH

SECTION ON A B C D

SECTION ON PXXTY.

PLAN

SCHEDULE :
D 100 x 200 cm   W 90 x 140 cm
D₁ 80 x 160 cm   S 100 x 180 cm

Fig.   1·1

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(Pages : 3)

Reg. No..............................

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

B.TECH. DEGREE EXAMINATION, NOVEMBER 2016

Fifth Semester

Branch : Civil Engineering

CE 010 504—GEOTECHNICAL ENGINEERING—I (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Graph / Semi log sheets to be supplied.
Missing data if any, may be suitably assumed.

Part A

Answer all questions.
Each question carries 3 marks.

1. What do you mean by three-phase system ?

2. State Darcy's law. What are its limitations ?

3. Differentiate between Compaction and Consolidation.

4. Enumerate the causes of pre-consolidation.

5. Define zero air void line.

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain Consistency of soil and Density Index.

7. Explain the factors affecting permeability.

8. Differentiate between undrained test and consolidated drained test.

9. How does light compaction differ from heavy compaction ?

10. Explain square root of time fitting method of determining coefficient of consolidation.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. (a) Write a note on IS classification of soils. (5 marks)

(b) In a sedimentation analysis 48 g. of soil passing 75 μm is dispersed in 1000 ml of water in order to estimate the percentage of particles less than 0.003 mm., how long after the commencement of sedimentation, is the hydrometer reading to be taken. The centre of the hydrometer is 165 mm. below water surface. $G = 2.72$ and μ of water is 0.001 Ns/m^2.

(7 marks)

Or

12. (a) What are the different methods for the determination of liquid limit of a soil ? Explain the merits of the method. (5 marks)

(b) An undistributed saturated specimen of clay has a volume of 18.9 cm^3. and a mass of 30.2 gram. On axes drying the mass reduces to 18 g. The volume of dry specimen as determined by displacement of mercury is 9.9 cm^3. Determine shrinkage limit, specific gravity, shrinkage ratio and volumetric shrinkage.

(7 marks)

13. (a) In a falling head permiameter test, the initial head is 60 cm. The head drops by 3 cm. in 6 minutes. Calculate the time required to run the test for the final head to be at 10 cm. If the sample is 4 cm. in height and 60 cm^2 in cross-sectional area, Calculate the coefficient of permeability taking area of stand pipe is 0.5 cm^2.

(7 marks)

(b) Explain any two methods to determine the coefficient of permeability of soil with neat sketch.

(5 marks)

Or

14. (a) A stratified soil deposit consists of four layers of equal thickness. The coefficient of permeability of the second, third and fourth layers are respectively 1/3, 1/2 and 2 times the coefficient of permeability of the top layer. Compute the average permeabilities of the deposit, parallel and ⊥ r to the direction of the stratification in terms of the permeability of the top layer.

(7 marks)

(b) Explain the procedure of drawing the actual flow net for flow through an anisotropic soil in which the fields are not squares.

(5 marks)

15. A vane of 80 mm. diameter and 160 mm. height has been pushed into an insitu soft clay at the bottom of a bore hole. The torque required to rotate the vane was 76 Nm. Determine the undrained shear strength of the clay. After the test, the vane was rotated several times and the ultimate torque was found to be 50 Nm. Estimate the sensitivity of the clay.

Or

16. On a saturated triaxial cylindrical specimen of soil, the major and minor principal stresses applied are 200 kN/m^2 and 60 kN/m^2 respectively. Check if the test specimen will fail, if it is assumed that the soil will have $c^1 = 5$ kN/m^2 and $\phi^1 = 25°$ with pore water pressure developed being 20 kN/m^2.

17. (a) What do you mean by field compaction control ? How is it achieved ? (5 marks)

(b) A cohesive soil yields a maximum dry density of 18 kN/m^3 at an OMC of 16 % during its standard proctor test. If the value of $G = 2.65$, what is the degree of saturation ? What is the maximum dry density it can be further compacted to ?

(7 marks)

Or

18. (a) Differentiate between finite and infinite slopes. (5 marks)

(b) Compare friction circle method and swedish circle method for the analysis of slopes.

(7 marks)

19. (a) Explain piston-spring analogy of Terzhaghi to demonstrate consolidation in soils. (5 marks)

(b) A saturated clay layer of 5 m. thickness taken 1.5 years for 50 % primary consolidation, when drained on both sides. Its the coefficient of volume change $m_v = 1.5 \times 10^{-3}$ m^2/kN, determine the coefficient of consolidation in m^2/year and the coefficient of permeability in M/year. Assume $\gamma_w = 10$ kN/m^3.

(7 marks)

Or

20. A soil has a compression index $C_c = 0.28$. At a stress of 120 kN/m^2, the void ratio was 1.02. Calculate :

(i) The void ratio of stress on soil is increased to 180 kN/m^2.

(ii) Total settlement of stratum of 6 m. thickness.

[5 × 12 = 60 marks]

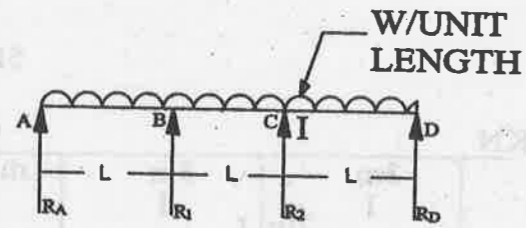14. (a) Analyse the continuous beam shown in Fig. VII by flexibility method.

Fig. VII

Or

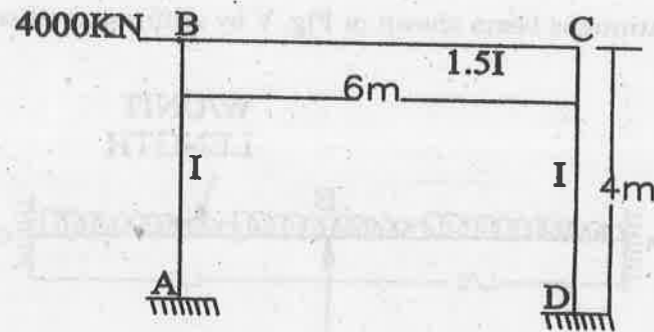(b) Analyse the frame shown in Fig. VIII by flexibility method.

Fig. VIII

15. (a) Briefly explain step by step the historical development of Finite element method.

Or

(b) Briefly discuss the Finite element approach in structural analysis. Also discuss the FEM formulation for a linear differential equation.

(5 × 12 = 60 marks)

B.TECH. DEGREE EXAMINATION, NOVEMBER 2016

Fifth Semester

Branch : Civil Engineering

CE 010 506—STRUCTURAL ANALYSIS—I (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. Define indeterminate structures.

2. Define kinematic indeterminate structures.

3. State Maxwell Betti's theorem.

4. Define force transformation matrix.

5. Discuss the advantages of finite element analysis.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 marks.

6. State Clapyron's theorem of three moments.

7. Discuss the structural behaviour of portal frame with sway.

8. Determine the stiffness matrix for a cantilever of span L for an applied load.

9. A fixed beam AB carries a moment M at mid span. Analysis the fixed beam by flexibility method.

10. Explain shape functions

(5 × 5 = 25 marks)

Turn over

Part C

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

11. (a) Draw the bending moment and shear force diagram for a continuous beam shown in Fig. I.
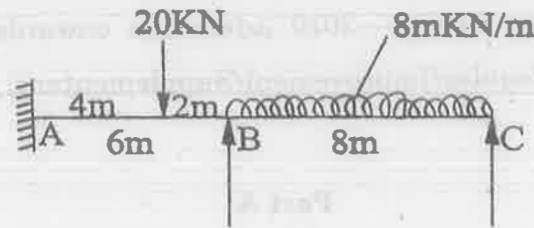

Fig. I

Or

(b) Draw the bending moments and shear force diagram for a beam shown in Fig. II.
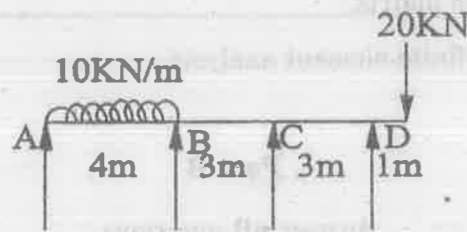

Fig. II

12. (a) Calculate the fixed end moments and draw the bending moment diagram for a beam shown in Fig. III.
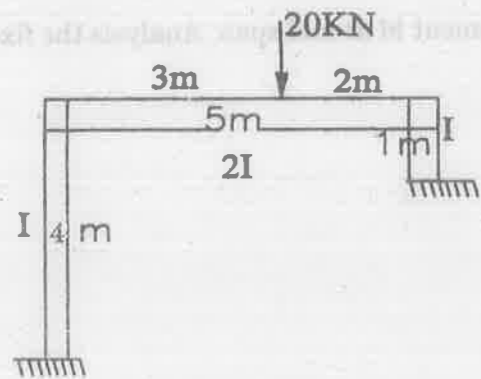

Fig. III

Or

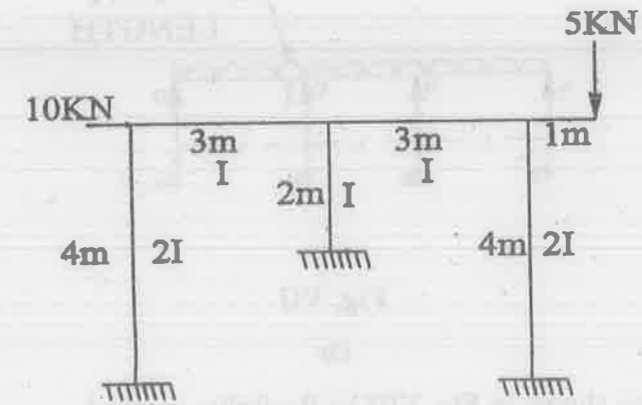(b) Calcualte the fixed end moments and draw the bending moment diagram for a beam shown in Fig. IV.

Fig. IV

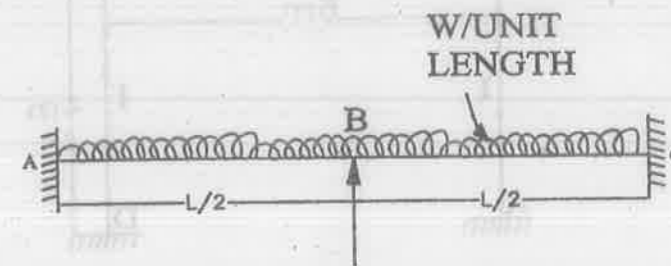13. (a) Analyse the continuous beam shown in Fig. V by stiffness method.

Fig. V

Or

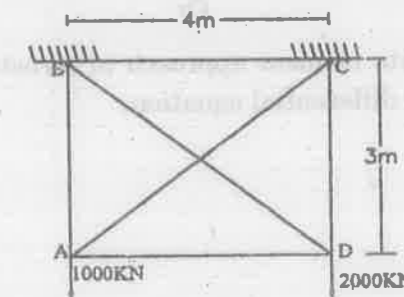(b) Analyse the pin jointed frame shown in Fig VI by stiffness method.

Fig. VI

Turn over